

INCREASING THE EFFECTIVENESS OF MESSAGES PROMOTING
RESPONSIBLE UNDERGRADUATE DRINKING:
TAILORING TO PERSONALITY AND MATCHING TO CONTEXT

by

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B.A., Simpson College, 2002

M.S., Kansas State University, 2004

AN ABSTRACT OF A DISSERTATION

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Abstract

Two studies address the serious problem of college student binge drinking. Both studies identify factors that improve the effectiveness of public service announcements (PSAs) encouraging responsible drinking presented through a website simulation.

Study 1 tested four levels of Message Personalization (i.e., extent to which the PSA targets important aspects of the individual's personality) by comparing the effectiveness of messages matched to the person's Big Five personality traits, their actual self-schema, their ideal self-schema, or a non-personalized control message. Matching to actual self-schema has been found to be effective in past research. However, it was expected that the more thoroughly personalized the message, the more effective it would be. Results revealed that in no instance was the most thoroughly personalized condition (Big Five matched) or the alternate way of matching to schema (ideal self-schema) more effective than the actual self-schema matching. When designing PSAs, there appears to be a threshold of personalization. Research related to testing PSAs discouraging binge drinking should continue to pursue self-schema matching rather than the more complicated Big Five matching.

Study 2 tested *Person Matching* (i.e., whether the PSA matches the person's self-schema type or not) and two types of Context Matching (i.e., whether the PSA matches the *Topic* or *Values* of the message context) to determine their relative influence on the effectiveness of the PSA. It was expected that PSAs matched to any of these factors would be more effective than messages not matched, and that Person Matching would be more influential on the PSA's effectiveness than the two types of context matching. Person Matching reduced intentions to

drink while staying in/home, but Topic Matching reduced intentions to drink when going out, suggesting that different factors are important for PSAs targeting drinking behavior in different locations. The interaction of Topic Matching and Values Matching indicate that the PSA should not match the message context too closely. Again, there appears to be a matching threshold; increasing the number of factors the message matches does not increase message effectiveness, possibly because it makes the message too redundant with the webpage content.

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CHAPTER 1 - Literature Review

Definition of Binge Drinking

Binge drinking, also referred to as heavy or episodic drinking, is widespread and particularly troubling among American college student populations. Binge drinking differs from other types of alcohol abuse in that it involves consuming large quantities of alcohol over short amounts of time. Binge drinking is traditionally defined as consuming five or more alcoholic beverages in a row (for men), or consuming four or more in a row (for women), at least once within the past two weeks. It is at this point that a person will have increased chances of experiencing problems resulting from their alcohol consumption and that they will also expose others to the risk of second-hand effects (Wechsler, Lee, Kuo, & Lee, 2000). The dual definition is necessary because the genders tend to differ in body weight and the manner in which they absorb alcohol into the bloodstream (Frezza, di Padova, Pozzato, Terpin, Baraona, & Lieber, 1990).

Prevalence of Binge Drinking

It has been estimated that 80 percent of undergraduates drink alcohol (Wechsler, Lee, Kuo, & Lee, 2000). Though many in this 80 percent are underage drinkers, many of these students are able to responsibly handle their decision to drink alcohol. Not all college students are able to responsibly control their drinking behavior, and they drink to excess; these people are considered binge drinkers. Binge drinking occurs frequently among undergraduates (Gill, 2002; Kuo, Adlaf, Lee, Gliksman, Demers, & Wechsler, 2002; Kypri, Langley, McGee, Saunders, & Williams, 2002). By the operational definition given above, Wechsler, Lee, Kuo, and Lee (2000)

reported that 44% of undergraduates (50% men, 39% women) binge drink. An even more disturbing finding was that 23 percent of college students binge drink more than once a week.

The greatest proportion of problem drinkers exists in university/college populations compared to other demographic groups in America (USDHHS, 1995). Heavy drinking in the general population is not declining, and decreases are also not being seen among college populations (Gill, 2002; Wechsler, Lee, Kuo, Seibring, Nelson, & Lee, 2002). Further, a nationally representative college sample was found to have a weekly average of drinks twice that of the general population (Engs, Diebold, & Hanson, 1996). The young age of college students is not to blame, however, given that undergraduates engage in heavy drinking more often than peers who are not attending college (Johnston, O'Malley, & Bachman, 2000; O'Malley & Johnston, 2002; USDHHS, 1995). The college environment seems to be a risky setting for young people to experiment with heavy drinking.

Thirty-one percent and six percent of undergraduates would qualify as alcohol abusive and alcohol dependent, respectively, if diagnosed according to the DSM-IV (Knight, Wechsler, Kuo, Seibring, Weitzman, & Schuckit, 2002). When only considering the subsample of binge drinkers, 20 percent would have qualified as being dependent on alcohol. Alcohol abuse occurs when the individual's life becomes significantly negatively affected by their alcohol consumption. For example, due to alcohol use, the individual may be unable to fulfill work or interpersonal roles, they may put themselves and others in physically dangerous situations (e.g., drunk driving), and they may encounter problems with the law. Further, they continue to use alcohol despite all of these serious problems. Alcohol dependence occurs after an individual has been using alcohol over a longer period of time. Symptoms of dependence include tolerance of alcohol and withdrawal symptoms in the absence of alcohol. The lives of alcohol dependent

individuals are seriously negatively affected because alcohol becomes a focal part of their life. These individuals spend a lot of time thinking about, using, and recovering from alcohol, and they have difficulty quitting even if they desire to do so (American Psychiatric Association, 1994). The U.S. Surgeon General, in 2000, discussed the importance of pursuing significant reductions in the heavy drinking of undergraduates and suggested it should be reduced by 50% by 2010 (USDHHS, 2000, as cited in Wechsler & Nelson, 2001).

Risk factors related to the college environment increase the occurrence of binge drinking in some groups. Membership in social organizations like Greek organizations (fraternities and sororities) or athletic organizations is found to be associated with increased binge drinking (Martens, Dams-O'Conner, & Beck, 2006; Presley, Meilman, & Leichliter, 2002; Strano, Cuomo, & Venable, 2004). In addition, even being a college sports fan and attending sporting events is associated with binge drinking (Nelson & Wechsler, 2003). Demographic risk factors for binge drinking include gender and age. Male students engage in binge drinking more frequently than female students (Strano, Cuomo, & Venable, 2004; Wechsler, Dowdall, Davenport, & Castillo, 1995). Students not of legal drinking age engage in binge drinking more frequently than of-age students (although a higher *percentage* of these older students drink heavily) (Keeling, 2002; Presley, Meilman, Cashin, & Lysterla, 1996; Schulenburg et al., 2001).

Negative Consequences Associated With Binge Drinking

Undergraduate binge drinking contributes to many problems for the student engaging in the drinking (Canterbury, Grossman, & Lloyd, 1993; Engs & Aldo-Benson, 1995; Johnston, O'Malley, & Bachman, 1997; Straus & Bacon, 1993; Wechsler, Lee, Kuo, & Lee, 2000). Heavy alcohol consumption is associated with serious physical health problems, social/interpersonal problems, legal problems, and academic problems. Binge drinking has a negative impact on the

life of the drinker, but it also negatively affects the lives of loved ones, acquaintances, and even strangers.

Binge drinking causes the drinker's body physical damage by interfering with the proper absorption of vitamins and other nutrients, which decreases immune function. If binge drinking behavior is continued over a long period of time and vitamin deficiency continues, the drinker can develop Korsakoff's syndrome, which also impairs the drinker's cognitive functioning. Sadly, once this disease has developed and cognitive deterioration has begun, the situation cannot be improved (Martin, Adinoff, Weingarter, Mukherjee, & Eckardt, 1986). Heavy drinking over a long period of time can also lead to the development of cirrhosis of the liver. This disease involves the accumulation of scar tissue in the liver which interferes with the liver's ability to purify the blood. While these problems associated with heavy drinking are not immediate, they are very serious. Death from alcohol abuse is often attributed to cirrhosis (Klatsky & Armstrong, 1992).

The binge drinker also encounters more immediate serious effects due to their binge drinking in many aspects of their life. Wechsler, Lee, Kuo, and Lee (2000) described several alcohol-related problems, including missing class, not keeping up with school work, driving after drinking, forgetting where you were or what you did, arguing with friends, engaging in unplanned/ irresponsible sexual activities, doing something you regret, damaging property, getting in trouble with police, getting hurt/injured, and requiring medical treatment for an overdose. *Occasional* binge drinkers had five times the likelihood, and *frequent* binge drinkers had twenty-one times the likelihood, of experiencing five or more of the alcohol-related problems, compared to non-binge drinkers. More recent research suggests that a distinction between "heavy drinking" and "heavy and frequent drinking" would be helpful in alcohol

treatment interventions given that these frequent heavy drinkers are at such a greater risk for negative consequences (Presley & Pimentel, 2006).

Alcohol-related problems can have serious negative consequences, and these consequences can have an affect on the drinker for the rest of his/her life. Binge drinking can lead to serious injury, and even death. Injury following alcohol use is a major cause of death among undergraduates (McGinnis & Foege, 1993), and heavy drinkers are twice more likely to die from unintentional injuries than non-binge drinkers (Anda, Williamson, & Remington, 1988). Each year, approximately 500,000 college students are injured in alcohol-related accidents, and 1,400 undergraduates die from unintentional injuries due to alcohol (Hingson, Heeren, Zakocs, Kopstein, & Wechsler, 2002). Driving after drinking can lead to accidents resulting in the injury or death of the driver, passengers, or innocent bystanders. Hingson et al. (2002) reported that, out of an 8 million student sample, 2.1 million undergraduates (26.5 percent) drove when intoxicated, and 3 million (37.5 percent) were passengers of someone who was under the influence.

An alcohol overdose can be very serious and the drinker may die if they do not receive prompt medical treatment. Approximately 150,000 college students develop health problems related to their alcohol use each year (Hingson, et al., 2002). Binge drinkers are more likely than non-drinkers to have higher numbers of sexual partners (Lowry, et al., 1994), and having unplanned and irresponsible sexual encounters can lead to unwanted pregnancies and sexually transmitted diseases. Moderate to high amounts of alcohol produce aggressive behavior in about one-third of drinkers (Taylor & Leonard, 1983), which can lead to serious crimes such as vandalism and date rape. Approximately 11 percent of students admitted to damaging property while intoxicated (Wechsler, et al., 2002). Each year, more than 600,000 students are assaulted

by another student who is intoxicated, and more than 700,000 students are victims of sexual assault by another student who has been drinking (Hingson et al., 2002).

The repeat of other behaviors over time can lead to serious problems, even if they may not have serious immediate consequences. Repeatedly arguing with a friend or roommate while intoxicated can damage or ruin the relationship, especially given that alcohol lowers inhibitions and makes the drinker more likely to say things they normally would not in a sober state. In fact, Fischer, Fitzpatrick, Cleveland, Lee, McKnight, and Miller (2005) revealed that students who binge drink frequently have more disagreements with their romantic partners (in general and specifically related to alcohol use), and they use less positive tones while talking with them. Another possible consequence of binge drinking is getting caught damaging school or city property, and the associated encounters with police could lead to expulsion from school, large fines, or jail time. Missing class and getting behind in school work can be serious if it goes so far that the student fails classes or drops out of college. Drinking and grade point average are negatively correlated; as drinking increases, grade point average decreases (Presley, Meilman, Cashin, & Lysterla, 1996). Failing at educational and associated career-related goals will affect the rest of that individual's life (Cummings, 1997).

Binge drinkers are not the only people negatively affected by heavy drinking. As mentioned before, alcohol-related car accidents may involve other people like passengers of the car or innocent bystanders like pedestrians or occupants of other vehicles. These other people can be seriously injured and even die from such injuries. Others affected by binge drinking include victims of date rapes and vandalisms occurring after heavy drinking. Other students, such as friends, roommates, and mere acquaintances, who avoid binge drinking are disturbed

from their homework, leisure activities, and sleep by heavy drinkers, and they are victims of property damage, arguments, and unwanted sexual advances (Wechsler, Lee, Kuo, & Lee, 2000).

Even though binge-drinking undergraduates encounter such negative consequences, few would admit the problems result from the heavy drinking (Tryon, 1986). Perhaps this is because undergraduates do not understand what “binge drinking” is. Undergraduates tend to think binge drinking is defined as being a higher number of drinks than it actually is (Wechsler & Kuo, 2000). Only 13 percent of undergraduates could accurately describe the prevalence of binge drinking on campus. Approximately half of the students thought that binge drinking was not as big of a problem as it actually is.

Interventions Used to Address Problem of Binge Drinking in College Students

Traditional Approaches

Through the years, colleges and universities have attempted to reduce undergraduate binge drinking (Berkowitz & Perkins, 1986). Traditionally, educational classes are implemented to teach skills for alcohol refusal, enhance students’ self-esteem, and increase their awareness of serious alcohol-related problems (Haines & Spear, 1996). Many campuses target high-risk groups such as Greek organizations, athletic teams, and incoming freshmen. Traditional programs may offer “dry” social events in which alcohol is unavailable, or they may ban alcohol in the dormitories or the entire campus. Also, many colleges and universities do not sell alcohol at athletic events (Wechsler, Kelley, Weitzman, San Giovanni, & Seibring, 2000).

Most colleges in the U.S. still implement educational approaches to reduce heavy drinking among students (Wechsler, Seibring, Lui, & Ahl, 2004). However, traditional approaches to reduce heavy undergraduate drinking are not generally effective (Moskowitz, 1989; Perkins & Berkowitz, 1986). Caudill, Luckey, Crosse, Blane, Ginexi, and Campbell

(2007) report that traditional approaches, like social skills training, may produce promising short-term results for heavy drinkers, but the reductions in drinking will dissipate over time. Dunleavy and Campbell (2006) also suggest that social skills training can be a useful tool for refusing alcohol related pressures.

With the recognition that binge drinking is a serious problem in the college population, there has been a large amount of funding devoted to alcohol reduction programs. Still, undergraduate binge drinking levels remain stable. Traditional programs increase knowledge related to binge drinking and the associated negative consequences, but they do not reduce drinking behavior (Miller, et al., 1995; Walters, 2000; Walters, Bennet, & Miller, 2000). Further, the traditional approaches often involve implementing several strategies at once, so even if one of the prevention efforts was somewhat more effective than others, it would be impossible to determine which one was effective.

Social Norms Marketing

Social norms marketing is another very common strategy used to reduce undergraduates' binge drinking. In this context, social marketing involves presenting public service announcements (PSAs) discouraging heavy drinking to students through various media outlets. PSAs are a type of advertisement that are broadcast with the aim of raising awareness of an issue in order to change the attitudes and behaviors of the public for their own good. Appeals to reduce college drinking are one of the most common types of PSAs (Treise, Wolberg, & Otnes, 1999).

The most common type of intervention used to discourage binge drinking in college students involves a social marketing campaign using social norms. The percentage of colleges using this approach increased from 20 percent in 1999 (Wechsler, Kelley, Weitzman, San

Giovanni, & Seibring, 2000) to approximately 50 percent in 2001 (Wechsler, et al., 2003). More recently, this percentage has been reported at 50 percent as well (Wechsler, Seibring, Liu, & Ahl, 2004).

Social norms marketing PSAs attempt to give students a more accurate perception of the drinking norms on campus. As mentioned before, research has consistently shown that students do not have accurate perceptions of what constitutes binge drinking (they tend to overestimate the number of drinks a person can have and not be “binge drinking”) and they do not have accurate perceptions of how big of a problem binge drinking is on campus (they underestimate the number of students who binge drink) (Wechsler & Kuo, 2000). Further, it is also clear that students do not have accurate perceptions of drinking norms (they think that more students drink alcohol than actually do, and that students who do drink consume more alcohol than they actually do) (Baer, Stacy, & Larimer, 1991; Haines & Spear, 1996; Miley & Frank, 2006; Page, Scanlan, & Gilbert, 1999; Perkins, Meilman, Leichliter, Cashin, & Presley, 1999; Perkins & Berkowitz, 1986; Prentice & Miller, 1993). It is thought that students drink more than they would otherwise in order to be consistent with their perceptions of the norms. Miley and Frank (2006) note that binge drinkers overestimate drinking norms more consistently than do non-binging students. These misperceptions of the norms make the students feel justified or even pressured to drink as much as they do (Gomberg, Kessel-Schneider, & DeJong, 2001).

The social norms approach attempts to correct these misperceptions by presenting accurate norms by way of PSAs. It is hoped that upon learning the correct norms, students will reduce their drinking to be consistent with these accurate norms. First, the college surveys students to determine how many actually drink alcohol, and how much they consume. Then, the information is disseminated to students by PSAs through media outlets such as campus

newspaper and radio, fliers and t-shirts. The aim of the PSA is to reduce heavy drinking, or bring it more in-line with the accurate norms, rather than eradicate drinking completely.

However, a drawback of social norms campaigns is that current drinking norms may still be at unhealthy levels. “Normative behavior may indeed be pathological.” (Wechsler & Nelson, 2001, p. 290), especially among high-risk groups such as Greeks and athletic members (Thombs & Hamilton, 2002; Trockel, Williams, & Reis, 2003). When the campus norm is much lower than the small group norm, the campus-wide statistics are unbelievable and easily rejected. With high-risk groups, presenting small group norms may be more effective than campus-wide norms.

The social norms marketing approach leaves much to be desired. Although a large number of colleges (over 50 percent) have implemented the social norms approach to reduce binge drinking on campus, national levels of binge drinking have held steady over the past decade (Wechsler, Lee, & Kuo, 2002). The social norms approach has been found to be effective in studies on individual college campuses (Glider, Midyett, Mills-Novoa, Johannessen, & Collins, 2001; Gomberg, Kessel-Schneider, & DeJong, 2001; Haines & Spear, 1996; Perkins & Craig, 2002; see also Perkins, 2003, for a review). However, national studies suggest the social norms approach is ineffective at reducing binge drinking levels on college campuses (O’Malley & Johnston, 2002; Wechsler, Lee, Kuo, Seibring, Nelson, & Lee, 2002; Wechsler, Nelson, Lee, Seibring, Lewis, & Keeling, 2003).

It could be that the social norms approach is ineffective because it is targeted at too general an audience (the student body as a whole) (DeJong & Atkin, 1995). A potential solution is targeting social norms campaigns at smaller groups (e.g., athletic groups, Greek members, smaller groups of friends). Cho (2006) suggests that friends’ norms are much more influential than campus-based norms. Also, Perkins and Craig (2006) found that a social norms

intervention targeting a smaller group (student athletes) was effective at correcting misperceived norms and reducing heavy drinking and negative consequences associated with heavy drinking. Given the competition of PSAs with wide-spread beer advertisements (even in the campus newspaper), it seems that a larger effort needs to be placed on personalizing attempts at discouraging students from binge drinking (Saffer, 2002). Messages targeted to smaller groups of students or individual students may be more effective. Personalizing a message to individual students should be more effective at reducing the binge drinking problem (Miller, et al., 1995; Walters, 2000).

Using Tailoring to Increase Message Effectiveness

There is much literature in the communications and health fields supporting the use of tailored messages for increasing compliance with health behaviors. Tailoring health communications makes them more effective because people tend to pay more attention to tailored messages, more easily remember them, and consider them more trustworthy than non-tailored messages (Rimal & Adkins, 2003). Messages can be tailored to personal factors in order to make the message more relevant to the individual (Murray-Johnson & Witte, 2003). Health appeals can be tailored to the message recipient's motivations for performing the behavior and their appraisal of the situation.

Communicators can target many aspects of the recipient's behavior to motivate them to adopt a recommended behavior. The communicator can target issues that increase their perceived susceptibility to health risk if they do not take the recommended course of action. Communicators can increase recipients' perceived self-efficacy for adopting a behavior by finding ways to minimize their perceived barriers and encourage more positive attitudes about performing the behavior. Messages can be tailored to the person's stage of behavior change. For

example, if the person is already considering reducing their drinking behavior, a message can encourage them to act. If they are not yet considering reducing their drinking behavior, a message can encourage them to consider it. A message can be tailored to any behavior or belief related to that behavior, or any other personal factor associated with the behavior. Brannon & Pilling (2005) offer a review of types of attributes to which a message can be tailored in order to specifically influence binge drinking behavior. These attributes include such things as personality factors (impulsivity), age (being underage vs. of age), reasons for drinking (timing, escape, friendship), living situation (on-campus vs. off-campus), and many others (see also reviews by Baer, 2002; Dowdall & Wechsler, 2002; Larimer & Cronce, 2002; Presley, Meilman, & Leichliter, 2002).

Tailoring to an Individual's Behavior

Tailoring messages to an individual's behaviors can make it more likely they will adopt various healthy behaviors. There is evidence for this related to using tailored messages compared to non-tailored messages to persuade people to adopt healthy sun behaviors (Buller, Borland, & Burgoon, 1998), stop smoking (Prochaska, DiClemente, Velicer, & Rossi, 1993; Strecher, et al., 1994), engage in physical activity (Bull, Kreuter, & Scharff, 1999; Kreuter & Strecher, 1996; Rosen, 2000), and adopt healthy nutrition habits (Brug, Campbell, & van Assema, 1999; Brug, Steinhuis, van Assema, & de Vries, 1996; Campbell, et al., 1994).

Tailoring messages to individuals' behavior has also been used to effectively reduce problem drinking in the general population (Miller, Sovereign, & Krege, 1988) and college students specifically (Baer, et al., 1992; Larimer et al., 2007; Marlatt, et al., 1998; Neighbors, Larimer, & Lewis, 2004; Walters, 2000; Walters, Bennett, & Miller, 2000; see Walters & Neighbors, 2005 for a review). Miller, Sovereign, and Krege (1988) first used the Drinker's

Check-up (DCU) to identify individuals' drinking-relevant information like family history, life problems, drinking patterns, and symptoms that would indicate dependence on alcohol. Next, an individualized feedback session was tailored to the drinker's personal risk factors. This approach worked modestly well given that they saw a 27 percent drop in drinking. This effect was seen regardless of whether participants received the minimal one-time intervention or the longer-term 6-week to 18-week intervention. Baer et al. (1992) individually tailored a one-hour feedback session to the student's motivations for drinking and found that it was as effective as a six week educational class/discussion group. The studies suggest that very brief interventions involving personalized feedback have the potential to be as effective as intensive, long-term interventions.

Utilizing BASICS (Brief Alcohol Screening & Intervention for College Students), Marlatt et al. (1998) gave high-risk incoming undergraduates either a brief, personalized intervention or no intervention. The personalized intervention involved feedback and discussion relative to their drinking behavior and their beliefs about alcohol, and their personal risk factors for problems associated with drinking alcohol. For example, if the student reported very high peak blood alcohol levels and missing classes, these issues were discussed as risk factors for the student developing more serious problems. However, if a different student lived in a fraternity house, that risk factor would be targeted in the feedback session. Both short-term and long-term significant decreases in drinking behavior and problems associated with drinking behavior were observed among students who received personally tailored feedback, while these results were not observed in the control group.

Neighbors, Larimer, and Lewis (2004) personalized a message targeting the individual's drinking behavior and perceptions of campus drinking norms. This intervention reduced misperceptions about drinking norms and reduced drinking behavior, with results lasting six

months. Tevyaw, Borsari, Colby, and Monti (2007) presented college students with personalized feedback in the context of an individual motivational interview. They found a significant reduction in the number of days the student drank at all and the number of days they drank heavily in the month after the intervention.

Walters, Bennett, and Miller (2000) used the CHUG (Check-Up to Go) to assess individuals' drinking behavior and associated problems and then personally tailored feedback sessions. The CHUG allows tailoring feedback to risk factors such as the quantity and frequency of alcohol consumption, peak weekly blood alcohol levels, and the amount of money spent on alcohol each year. Students who received personalized feedback through the mail reduced drinking behavior significantly more than the group who received an educational class in addition to the personalized feedback (who surprisingly did not differ from the control group at follow-up). This may suggest that utilizing a traditional educational approach in combination with a personalized approach may even detract from the effectiveness of the personalized approach. Walters (2000) also found that undergraduates who received personalized feedback tailored using information gained through the CHUG reduced their drinking behavior more than a control group.

Saitz et al. (2007) tested the effectiveness of an internet-based alcohol use assessment and personalized feedback intervention on a group of college students considered to be heavy drinkers. Thirty-three percent of women and 15% of men considered to be heavy drinkers at baseline were no longer considered such after the intervention. The researchers suggest more research use web-based interventions to promote responsible drinking. Larimer et al. (2007) assessed student drinking information and mailed students personalized feedback. They found reductions in heavy episodic drinking in this feedback condition, while the control group did not

exhibit reduced drinking levels. White, Morgan, Pugh, Celinska, Labouvie, and Pandina (2006) evaluated the effectiveness of personalized mailed feedback and a personalized interview session during which feedback was provided to the student about their drinking behavior. Both types of feedback were equally effective in reducing college students' drinking and problems associated with heavy drinking. These studies suggest a face-to-face encounter is not necessary to reduce problem drinking.

It is very positive that such tailored interventions have been effective at decreasing undergraduates' drinking. Tailoring, or personalizing, a message to an individual's behavior (rather than targeting the group's behavior as a whole, as in the social norms marketing approach) has been shown to improve the effectiveness of health appeals. Though the personalized behavioral feedback approach is more personalized than the social norms approach because it is individualized, the tailoring of this approach is limited to aspects of the individual's behavior. A message could be even more personalized if it is tailored to more central aspects of the individual's self-concept. Few researchers have attempted to tailor messages very personally to an individual - to personality or self-schema. Yet, this should be even more effective than current tailored attempts to decrease binge drinking among undergraduates.

Tailoring to Self-Schema

Schema correspondence theory (Brock, Brannon, & Bridgwater, 1990) offers a way to tailor communications very centrally to a person's core values in order to increase adoption of health behaviors. This theory supports tailoring to the person's self-schema. A schema, in general, is a structured cognitive organization of information about the world that a person uses to interpret and categorize new information. A self-schema, specifically, is a type of schema relevant only to that person; following the definition given for "schema" above, a self-schema is

the structured cognitive organization of information about the self that a person uses to interpret and categorize new information about the self.

Self-schemas provide helpful guidance for the interpretation of new information, and they direct an individual's behavior (Markus, 1983). Individuals are particularly sensitive to self-relevant stimuli, which can be processed very quickly and efficiently. Self-schemas influence an individual's information processing, his/her goals and motivations, and emotions. They also contribute to the individual's social perceptions, comparisons, and interactions (Markus & Wurf, 1987). Sentis and Markus (1986) describe self-schema to be an individual's guide to his/her own personality. Markus and Sentis (1982) state:

With respect to the self, individuals with self-schemata in particular domains: (1) can process information about the self efficiently (make judgments and decisions with relative ease and certainty); (2) are consistent in their responses; (3) have relatively better recognition memory and recall for information relevant to this domain; (4) can predict future behavior in the domain; (5) can resist information that is counter to a prevailing schema; and (6) evaluate new information for its relevance to a given domain. With respect to processing information about others, these individuals: (1) make accurate discriminations in the domain in question; (2) categorize or chunk schema-relevant information differently; (3) are relatively more sensitive to variations in this domain; (4) select and prefer information that is relevant to this domain; and (5) make confident attributions and inferences about behavior in this domain. (p. 62)

A paucity of research has investigated the role that self-schemas play in the persuasion process (Brock, Brannon, & Bridgwater, 1990; Cacioppo, Petty, & Sidera, 1982; Petty & Wegener, 1998a; Petty, Wheeler, & Bizer, 2000; Wheeler & Petty, 2001), even though self-schemas are recognized to play a large role in individuals' information processing and resulting behavior. Petty, Wheeler, and Bizer (2000) suggested more research was needed to evaluate the influence of self-schemas on persuasion, after noting its lack of coverage in the literature.

Several studies found support for tailoring communications to an individual's self-schema to increase persuasion for health-related and consumer behaviors (Brannon & McCabe,

2002; Brock, Brannon, & Bridgwater, 1990; Pease, Brannon, & Pilling, 2006; Pilling & Brannon, 2007). These studies employed the same basic methodology. First, participants were presented with four self-schema types and were asked to select which one most overlapped with their own self-concept. Each self-schema type was represented on a separate card containing the phrase “I am...” along with four identifying adjectives. Each of the schema cards also contained descriptive summary statements about the self-schema type with a picture of people whose attire and activities represented the self-schema type. The four self-schema types were responsible-dependable-helpful-sensible, adventuresome-skillful-competitive-spontaneous, warm-communicative-compassionate-feeling, and versatile-wise-conceptual-curious. Table 1 provides descriptions of the four schema cards. Not one of over 8000 subjects had any problem quickly selecting the schema type that most overlapped with their own self-concept. Further, construct validity has been established based on comparisons of participants’ ratings of these schema types and their ratings of similar but distinct materials (Brock, Brannon, & Bridgwater, 1990). The self-schema cards utilized in this line of research are based on the Keirsey-Bates (1978) approach (an alternative to the 16 type Myers-Briggs Type Indicator (MBTI), Myers, 1962). The MBTI (Myers, 1962; see also Thorne & Gough, 1991) became one of the most widely used personality tests in the last decades of the 20th century. It was developed based on Jung’s typological combination of traits (E/I) and predominant functions (thinking, feeling, sensing, and intuiting). The MBTI is considered comprehensive, as it would provide a personality description for all people (Winter & Barenbaum, 1999).

The schema cards used in this line of research are preferable to the schema types used in previous research on schemas as they encompass more of the self-concept. For example, the adventuresome-skillful-competitive-spontaneous self-schema provides more information than the

masculine-feminine discrimination used in past research. Additionally, the schema cards were used as part of a Discovery program conducted in California high schools to promote understanding between teachers and students (Lowry, 1987). They are meaningful to both younger and older populations (Hoffman & Betkouski, 1981; McCarly & Carskadon, 1986).

After a participant selected one of the four possible self-schema cards, he/she was exposed to a persuasive message tailored to the selected schema. The message was presented as a short essay, a radio script, or a direct mail letter. Four distinct messages were created by the researchers using rhetorical styles to represent each of the four schema types. Although each message contained the same basic information, they contained different persuasive arguments for why changing the targeted behavior was consistent the values of the schema types. For example, the responsible schema message would emphasize the reasonableness and sensibility of adopting the health behavior, while the communicative message would suggest that not doing the behavior interferes with the person's desire to be true to themselves and that it might cause problems in their close relationships. The researchers gauge participants' reactions to the messages. Typical dependent measures include attitudes about the behavior or intentions to perform the behavior. Attitudes are measured because they influence behavior either directly (Eagly & Chaiken, 1998; Petty & Wegener, 1998b) or through their influence on intentions (Ajzen & Fishbein, 1980). Intentions are of interest because they are considered the most proximal predictor of behavior (Ajzen & Fishbein, 1980).

Schema-correspondence theory is supported by several independent studies (Brock, Brannon, & Bridgwater, 1990; Brannon & Brock, 1994; Brannon & McCabe, 2002; Pease, Brannon, & Pilling, 2005; Pilling & Brannon, 2007). In each study, no one schema message was generally more persuasive than the others. In support of the theory, participants receiving a self-

schema matched message were more persuaded by the message than those receiving a non-matched message. Brock, Brannon, & Bridgwater (1990) conducted a national campaign to re-enlist diet program participants. Matching messages to participants' self-schemas increased the re-enlistment rate by twelve percent, compared to those receiving non-matching or control messages. Most public health campaigns receive very low response rates, thus this study compared favorably (Farquhar, et al., 1990). In two related studies, Brannon and McCabe (2002) found support for schema-correspondence theory when participants who received schema-matched messages were more likely to request additional information regarding AIDS risk and to think about preventive behavior than those receiving non-matched messages.

More support for schema correspondence theory was found in two independent studies specifically investigating college student binge drinking. Messages tailored to self-schema that promoted responsible drinking or responsible sexual behavior were more effective than non-matched control messages (Pease, Brannon, & Pilling, 2006). Pilling and Brannon (2007) compared the effectiveness of PSAs tailored at various levels of personalization. They compared messages based on the social norms marketing approach (based on other people's behavior), the personalized (individualized) behavioral feedback approach (tailored to the individual's drinking behavior), schema correspondence approach (tailored to the person's core values), and a neutral control. The schema-matched messages were more effective than the neutral control, providing support for schema correspondence theory. Actually, both the schema correspondence approach and the individualized behavioral feedback approaches were equally effective, and they were both significantly more effective than the social norms marketing approach and the neutral control. The social norms marketing approach was no more effective than the control. This result is disturbing given the number of colleges that use the social norms marketing technique in

the hope of reducing binge drinking. This study provides support for tailoring health communications to individuals given that the two approaches which did so were more effective than the popular social norms approach and the control.

Self-schema matched messages may be more effective than non-matched messages because participants pay close attention to, and remember more, message arguments when they reflect the values of their own self-schema (Markus & Sentis, 1982; Markus & Wurf, 1987). Message recipients also report finding the self-schema matched messages have stronger and more relevant arguments (Cacioppo, Petty, & Sidera, 1982).

Tailoring to Ideal Self-Schema

Tailoring health communications to an individual's self-schema has been found to be effective, but another way of tailoring messages to people's values is tailoring to ideal self-schema. An ideal self-schema is a mental representation of the type of qualities, characteristics, and values a person would ideally like to have. In other words, it represents the type of person they would like to be, as opposed to the actual self-schema which represents who the person is in reality. Investigating the effectiveness of tailoring to the ideal schema in the context of discouraging binge drinking would also be interesting. Past research suggests that considering the ideal self in addition to the actual self is important (Higgins, 1987). It is possible that matching to the ideal self-schema may be equally, or even more effective than matching to the actual self-schema in some circumstances given how the ideal schema concept is defined (e.g., Sentis & Markus, 1986; Sirgy, 1982). For example, Sentis and Markus (1986) stated that "Possible selves represent motivations within the self-concept. They give specific cognitive form and meaning to an individual's hopes, fears, goals, and motives (Markus & Nurius, 1986).

It is important to assess these aspects of the self-schema because they function as incentives for future behavior” (p. 173).

To date, there is only one study (Brannon & Brock, 1994) discussing research relating to the topic of tailoring to the ideal schema, and it discusses comparing the effectiveness of tailoring persuasive messages to the actual self-schema versus the ideal schema. Though little research has investigated it, the role of the ideal self-schema in persuasion may be important. Brannon and Brock (1994) investigated schema correspondence theory in relation to advertising appeals. They compared persuasive appeals tailored to an individual’s actual self-schema, their ideal self-schema, or a non-matched message. They found that matching to the actual self-schema was more effective than not matching to self-schema. Sometimes using either type of self-schema matching was more effective than the non self-schema matched message. In some circumstances, matching to actual and ideal self-schema was equally effective, but sometimes matching to ideal self-schema was less effective.

Given that only one study to date has investigated tailoring to the ideal schema compared to the actual self-schema, more exploratory research on this topic is warranted. It would be interesting to determine if matching to the ideal or actual self-schema is more effective when attempting to persuade students to drink responsibly. Generally speaking, it is expected that matching to the actual self would be more effective because it is a better fit with the person’s perceived self-concept. Although not the focus of the present dissertation, the issue of matching messages to recipient’s actual versus ideal self-schemas raises a variety of interesting issues.

Future research might examine if there are any situations where matching to the ideal self-schema would be more effective (e.g., if those who drink to transform into someone more similar to their ideal schema would be more persuaded by a message tailored to that ideal schema).

Additionally, studies can explore whether those who have matching actual and ideal schemas (i.e., they perceive themselves to be the person they would prefer to be) are more persuaded by a message tailored to their self-schema compared to those whose actual and ideal self-schema are different. Future studies could investigate which type of matching would be more effective if the person's actual and ideal self-schema are discrepant.

While the schema distinction used to match individuals' personalities in tests of schema correspondence theory are meaningful to people and more fully descriptive than previous schema distinctions (e.g., masculine/feminine; high/low self-monitor), Brannon and Brock (1994) suggest that using a more refined measure of schema (or, personality) may have the potential to increase message effectiveness. They suggest that using a personality measure that is focused on more aspects of the person's schema could be more persuasive than the more global schema types used in their research.

While tailoring to an individual's self-schema is very personalized because it aims the message at how adopting a behavior is consistent with their core values, there may be more personalized ways to tailor to an individual's personality. The schema cards utilized in tests of schema correspondence theory are based on a simplified version of the Myers-Briggs Type Indicator (MBTI). While the MBTI is one of the most widely used personality assessments in industry settings, there are other scientifically rigorous and empirically derived personality assessments available for personality assessment. Most recently, personality theory has focused on trait theories. Some of these trait measures (e.g., the Minnesota Multiphasic Personality Inventory and the Big Five Inventory) are very well-respected, scientifically supported personality inventories. These inventories would potentially encompass more aspects of the person's tendencies than a simple choice of one of four possible schema types. Thus, a message

based on participants' responses to such inventories would be considered more personalized, and it is thought they may be more effective, than messages based on a simple self-schema selection.

Tailoring to the Big Five Traits

Although matching a message to a person's self-schema should increase its effectiveness, there are other ways of conceptualizing the self (such as in terms of individual traits) that might also be considered in terms of their usefulness for message tailoring. One widely accepted way of assessing personality is with the Big Five Traits which measure a more thorough depiction of a person's self-concept and their related behavioral tendencies. The BFI is based on trait theory, and traits are accepted as the most scientifically supported units of personality. The general consensus is that there are five personality traits that influence behavior in a variety of situations (John & Srivastava, 1999)¹.

The Big Five traits are Extraversion, Neuroticism, Conscientiousness, Agreeableness, and Openness. An individual has some level of each of the Big Five traits, which predispose them to behavioral tendencies. While the situation can also influence a person's behavior, people with the following levels of each personality trait will generally be observed acting in the following manners. The Big Five traits will be defined with terms with which they are assessed with the BFI. If a person is high on *Extraversion*, they tend to be talkative, full of energy, outgoing, social, enthusiastic, and assertive. Alternately, people low on Extraversion (or Introverted) tend to be reserved, quiet, and sometimes shy and inhibited. If people have a high level of *Neuroticism* (also known as Emotional Instability), they tend to be depressed or blue, tense, moody, a worrier, and they get nervous easily. On the other hand, those low in Neuroticism tend

¹ Although researchers prefer to measure continuous personality traits (like the Big Five), other believe that focusing on personality types, or clusters of personality attributes that go together, provides more useful information (e.g., Asendorf & van Aken, 1999; Brannon & McCabe, 2002; De Fruyt, Mervielde, & Van Leeuwen, 2002; Pease, Brannon, & Pilling, 2006; Pilling & Brannon, 2007 ; Rammstedt, Rienann, Angleiter, & Borkenau, 2004).

to be relaxed and handle stress well, emotionally stable and not easily upset, and they remain calm in tense situations. Individuals with high levels of *Openness* tend to be original, inventive, and come up with new ideas; curious about many things, like to reflect and play with ideas, and be deep thinkers; and they value artistic and aesthetic experiences. Those low in *Openness* are quite the opposite as they tend to prefer work that is routine and have few artistic interests. People high on *Conscientiousness* tend to be thorough, organized, persistent, reliable, and efficient when doing a job. Those with low levels of *Conscientiousness*, on the other hand, tend to be somewhat careless, lazy, and easily distracted from tasks. High levels of *Agreeableness* are associated with behavioral tendencies like being helpful, considerate, kind, unselfish, cooperative, and trusting and forgiving of others. Those low in *Agreeableness* tend to find fault with others, start quarrels with others, are cold and aloof, and sometimes rude (John & Srivastava, 1999).

These five traits were discovered through two distinct traditions (i.e., the lexical and questionnaire traditions), and the fact that these two traditions found converging evidence for the Big Five traits suggests that these five traits are important. Both traditions achieved the goal of trait psychology, which is to identify the traits present in a general descriptive taxonomy of personality. The traits found by both traditions are Extraversion, Neuroticism, Openness, Conscientiousness, and Agreeableness. The Big Five personality traits are stable across different methodologies and data sources (Goldberg, 1981, 1982, 1990) and relatively stable across different languages and cultures, at least other Western cultures (Angleitner, Ostendorf, & John, 1990; Costa & McCrae, 1997; DeRadd, Mulder, Kloosterman, & Hofstee, 1988; Hofstee, Kiers, DeRadd, Goldberg, & Ostendorf, 1997, see De Radd, Perugini, Hrebickova, & Szarota, 1998 for a review). Every person can be described as having a level of each of these traits. Each trait is

continuous, and we can gain the most general knowledge of an individual from knowing where they exist on each of the Big Five trait continua. We can use this knowledge to compare and differentiate among people's average behaviors across various times and places (John & Srivastava, 1999).

John, Donahue, and Kentle's (1991) Big Five Inventory (BFI) is one of several inventories available for assessing the Big Five traits². The BFI uses 44 short phrases based on trait adjectives that are known to represent the Big Five well (John, 1989, 1990) in order to assess individuals' levels of the Big Five traits. The BFI is shorter than other inventories, which is an advantage given that shorter questionnaires are more time efficient and reduce participant boredom and fatigue. Its use of adjective phrases rather than single adjectives is also an advantage because such items that contain elaboration are answered more consistently (Goldberg & Kilkowski, 1985). For example, instead of using the adjective "persevering" to measure Conscientiousness, the BFI has the phrase "perseveres until the task is finished" which is still simple, yet helps reduce ambiguity (John & Srivastava, 1999).

The BFI subscales each contain between 8 and 10 items, and they have good content coverage of the traits and good psychometric properties. The internal consistency reliabilities for the BFI subscales average at 0.85 (ranging between 0.75 to 0.90). Test-retest reliability averages 0.85 (ranging from 0.80 to 0.90) for a 3-month period. Excellent convergent and divergent validity exists between the BFI and other Big Five instruments (John & Srivastava, 1999).

² There are several different instruments that can be used to assess the Big Five traits, but the BFI is the most commonly used instrument in research settings where there is a concern for time. The BFI is less complex than the NEO scales which use a full sentence format, and it provides more helpful context than other scales that use single adjectives rather than adjective phrases (e.g., TDA by Goldberg, 1992), and the BFI also takes approximately one-third of the time to administer (5 minutes versus 15 minutes) (John & Srivastava, 1999). Based on their comparison of the NEO, BFI and TDA, John & Srivastava (1999) suggest that the 240-item NEO-PI-R be used only when time is not a big issue, when participants are well-educated and experienced test takers, and the research question calls for assessing multiple facets for each of the Big Five. However, in other cases, they recommend using the 44-item BFI because it offers a measure of the core attributes assessed by the NEO and it is time-efficient and easily understood.

Importance of Context in Message Effectiveness

The context within which incoming information is presented influences the way it is interpreted, comprehended, and remembered (Sahakian, 1982). The context in which a message is embedded influences how the message is processed (Chaiken & Stangor, 1987; Cooper & Croyle, 1984). The same person presenting the same persuasive message to the same audience will achieve varying levels of success depending on the context in which the message appears.

Relevance of a message to the surrounding context is important. In fact, past research indicates that when information is perceived as irrelevant (rather than relevant) to a particular context, people exert a limited effort in processing that information (Hastie & Kumar, 1979; Srull, Lichtenstein, & Rothbart, 1985), they do not recall the information as well (Heckler & Childers, 1992), and they have less favorable attitudes related to the information (Lee & Mason, 1999). On the other hand, research shows that relevant information is more thoroughly processed and is better available for recall (Rumelhart & Ortony, 1976), and it leads to more favorable attitudes and actual behavior change relevant to the information presented (Haberland & Dacin, 1992).

Advertising context affects message recipients' judgments of the advertised product (Puto, 1987; Smith, 1996; Woodside & Singer, 1994). The individual generally selects the information medium, so it is likely that they would evaluate ads that match the media context (e.g., an ad for fishing poles in *Field & Stream* magazine) as more valuable and intrinsically interesting than messages that are unrelated to the context they selected (e.g., an ad for a luxury car in *Field & Stream*). Individuals have a preference for their selected context and things that are relevant to that context (Aaker & Brown, 1972; Cannon, 1982). As such, advertisement context has been established as a very important factor in decision making related to ad

placement (Anderson & Ortony, 1975; Chook, 1985; Kennedy, 1971; McClung, Park, & Sauer, 1985; Soldow & Principe, 1981; Tulving & Thompson, 1973).

Media context influences ad recipients' attention to and processing of the message. The context can motivate the message recipient to pay closer attention to the ad by making certain needs more salient (MacInnis, & Jaworski, 1989; Petty & Cacioppo, 1986). Derks and Aurora (1993) and Perry, Jenzowsky, King, and Yi (1997) suggest that some contexts may be more appropriate for certain types of advertisements and advertisements can be made more effective by selecting the appropriate context for the ad.

Various context factors influence the effectiveness of ads embedded in those contexts. For example, the mood induced by the context (such as a sad or happy tv program) has been found to influence ad effectiveness (Goldberg & Gorn, 1987; Kamins, Marks, & Skinner, 1991; Schumann, 1986). Goldberg and Gorn (1987) found that people remembered ads better when they were embedded in happy rather than sad program contexts. Similarly, the emotional arousal or excitement induced by the context (i.e., an action-filled or an erotic program vs. a sitcom) influences ad effectiveness (Pavelchak, Antil, & Munch, 1988; Singh & Churchill, 1987). The involving nature of the context (such as a highly involving mystery or suspense show vs. a less involving situational comedy) has also been found to influence ad effectiveness (Bryant & Comisky, 1978; Lloyd & Clancy, 1991; Park & McClung, 1986; Soldow & Principe, 1981; Thorson & Reeves, 1986). Also, whether an online ad is placed on a "gateway" page (i.e., a page that just has links to other pages, but no real content of its own) versus a "content" page (i.e., a page containing information like a news story) influence ad effectiveness such that ads on content pages are rated more favorably (Moe, 2006). Bruner & Kumar (2000) investigated the role of website complexity on ad effectiveness and found that website complexity increases

perceptions that the website is interesting, but makes attitudes toward the site less favorable.

These results support the use of ad/context placement strategies, which have long been used in print media (Janiszewski, 1990; Yi, 1990), television (Murry, Lastovicka, & Singh, 1992; Park & McClung, 1986; Singh & Churchill, 1987; Soldow & Principe, 1981), and more recently online (Sherman & Deighton, 2001).

Ad/Context Congruency

Ad/context congruency may also influence the effectiveness of the advertisement, and this is of interest in the current study. An ad is congruent with the context if they both share a similar style or content. The focus is on the degree of physical or editorial similarity between the ad and the program context. For example, ad/context congruency would be achieved if a rational ad was placed in a rational news program or if a funny ad was placed in a situational comedy. Clearly, an ad and context would be incongruent (ad/context contrast) if a funny ad was embedded in a news program. A limited number of studies have investigated the effect of ad/context matching or mismatching, and the results are mixed as to how it influences ad effectiveness. While most studies find increased ad effectiveness (indicated by a more positive attitude toward the ad and greater ad recall) using ad/context congruency, some studies find reduced ad effectiveness or no difference.

Support for Increasing Congruence

Russell (2002), in the investigation of product placement directly in television shows, examined the influence of the modality (visual or audio) of product placement and the congruency between a product and the plot of a television show on recipients' memory and persuasion. Results showed that, in terms of visual placement of products, the product is more *memorable* when it is connected to the plot context, but it is more *persuasive* (i.e., participants

have more favorable attitudes toward the product) when it is not connected to the show's plot context. On the other hand, audio placements of products are more memorable than visual placements in general, regardless of their connection with the plot, and they are more persuasive when they are highly connected to the plot. Therefore, the advertisement's congruency with the plot matters, though the results vary based on modality of presentation.

Looking at stimulus/context congruity in general rather than in terms of advertising, Whittlesea (1993) found that congruency of a word with its sentence context influences people's judgments toward the word such that people rate words more favorably when they have high sentence congruency. On a computer screen, participants were exposed to a series of words that formed a complete sentence. The words were presented rapidly, and the final word of the sentence was either conceptually fluent with the sentence context (e.g., "The stormy sea tossed the boat.") or neutral with respect to the sentence context (i.e., "He saved up his money and bought a boat."). In the conceptually fluent condition, the sentence would be considered semantically predictive of the target word, while the word in the neutral condition could easily be replaced with a wide array of other words (e.g., the person could have saved up to buy a house or a car). He concluded that people form more favorable attitudes toward a target when it is presented in a conceptually fluent (i.e., congruent) context.

In a series of experiments, Lee and Labroo (2004) found that increasing conceptual fluency (i.e., presenting the target within a congruent context) improves participants' ratings of pleasantness of the target. They first replicated Whittlesea's findings in a pilot, and then extended his research by utilizing multiple levels of conceptual fluency. They presented participants with words that were either semantically predictive or neutral. Then, participants were asked to indicate how pleasant they felt toward the target word; the target word could be

either the same as the final word they had seen, semantically related to the word they had seen (e.g., they were asked to rate the word “tree” when they had seen “leaf”), or unrelated to the word they had seen. They found that participants preferred the semantically predictive words over the neutral words, and they found that participants rated the semantically related words more favorably than words that were unrelated to the target word. They also looked at the effect of context congruency in a marketing context using consumer products as targets. They exposed participants to a series of story boards that either were or were not conceptually fluent (congruent) with the target product. For example, the storyboards would be considered conceptually fluent with the product if the target product was ketchup and the storyboards presented pictures of the inside of a restaurant, a cook preparing a hamburger, then the ketchup bottle. The storyboards would not be conceptually fluent if they included pictures of the inside of a grocery store, and other products like soap and cereal prior to presenting the ketchup bottle. They found that participants evaluated the target products (e.g., the ketchup) more favorably when storyboard presentations were conceptually fluent with the product. Participants also evaluated a target product more favorably when the storyboard featured a related product (e.g., the storyboard presented a bottle of beer and they were later asked to rate a specific brand of bottled beer). They conclude that conceptual fluency (i.e., context congruence) leads to more favorable attitudes of the target products. Lee and Labroo (2004) are the only researchers to date who have looked at different levels of congruence (instead of just comparing 2 levels: congruence/ noncongruence). While they did compare context congruency to context contrast, they also compared liking of related products to non-related products. However, they did not compare all three types of congruency.

Aaker and Brown (1972) investigated ad/context congruency in print media and found ads were more effective when matched to the context. Cannon (1982) also found increased effectiveness of ads when using contexts congruent to the values expressed in the ad. Perry, Jenzowsky, King, and Yi (1997) found improved effectiveness of advertising in humorous contexts by using humorous ads. Kamins, Marks, and Skinner (1991) found that happy ads were rated more favorably when they were placed in happy programs and sad ads were preferred when they were placed in sad programs.

Sanbonmatsu and Fazio (1991) suggest that placing ads in congruent contexts may increase their effectiveness because the style or content of the context has already served to activate (or prime) knowledge structures in the brain necessary for processing the similar style or content of the ad. These activated knowledge structures will be readily accessible, so they will be used to easily process and remember the ad. Thus, they state that advertisers should select programs that prime mental representations related to the ad. This positive effect of ad/context congruency can be explained by priming (Herr, 1989; Yi, 1990b) or construct accessibility (Anderson, 1976). The mood the context evokes can also serve as a primer to facilitate processing of an ad that contains references to those emotions (Goldberg & Gorn, 1987; Perry, Jenzowsky, King, & Li, 1997).

Evidence against Increasing Congruence

On the other hand, some studies found no improvements in ad effectiveness utilizing congruent contexts or found ad/context congruency decreased message effectiveness (Cantor & Venus, 1980; Derks & Arora, 1993). Research on contrast effects (Myers-Levy & Tybout, 1997) suggests that ads that are novel or that present unexpected information would be perceived as more interesting. Research on stimulus distinctiveness (Hunt, 1995) suggests that an incongruent

ad would be more distinctive and stand out in the mind of the viewer. The theory of cognitive interference would suggest that congruent ads and program context would seem to merge together in the mind of the viewer, and thus the ad would be less memorable (Bryant & Zillmann, 1994). The expectancy disconfirmation literature would suggest that a message that is inconsistent with a message recipient's expectations would actually increase message processing (Maheswaran & Chaiken, 1991). When a person's expectations are disconfirmed, they tend to spend time thinking about it to try to resolve the conflict.

DePelsmacker, Geuens, & Anckaert (2002) suggest that the inconsistency in past results of research on the effects of ad/context congruency and researchers ability to explain both sets of results is due to an involvement moderator. Specifically, they state that the recipient's involvement in the product category influences their motivation to process the message. Thus, the recipient's low or high involvement in the product category will determine whether ad/context congruency increases or decreases ad effectiveness. People who are low (versus high) in involvement perceive the importance of or the risks involved in a decision as less relevant to themselves, they are not as interested in gathering product information, and they do not pay as much attention to the ad, instead relying on more peripheral cues to make their decision (Zaichkowsky, 1985). For example, when a person is anticipating making an expensive purchase, like a car, they should be high in category involvement because there are definite risks involved in such a purchase, thus most people are interested in gaining the most information possible before making the purchase. Most people would be much lower in product involvement when trying to decide what to have for an afternoon snack (of course, if someone is on a strict diet, they might be high in involvement on a product category such as a snack). As described above, a person's involvement depends on their perceptions of the importance of the risks

involved and how interested they are in gaining information about the product. In tests using print and television ads, they found it was not ad/context congruency itself that increased or decreased ad effectiveness. However, for low involvement recipients, ad/context congruency increased perceptions of ad likeability and clarity. On the other hand, for high involvement participants, ad/context contrast increased perceptions of ad likeability and clarity. Recipients who are low in involvement are unmotivated to process information deeply, and the researchers conclude that making the ad congruent with the context serves as a peripheral cue and makes it easier to and more likely they will process the message. On the other hand, the ad/context contrast is thought to further stimulate those who are already involved and motivated to deeply process the ad. The current study has similarities with this study because they both tested the effectiveness of messages in varying levels of context congruency. Because undergraduates are expected to have low involvement for the topic of “responsible” drinking (they are not highly motivated to think deeply about it), they should find PSAs more likeable when they are congruent with website context. However, it is possible that participants differ in their involvement with the issue (which may be related to how much they currently drink), and that this influences which congruency/contrast approach is more effective. It was expected that if participants are highly involved in the topic, a contrasting context may be preferable.

Shamdasani, Stanaland, and Tan (2001) investigated how matching the advertisement to the website context influences attitudes, intentions, and behavior related to the advertisement. They also looked at an involvement moderator, but it was defined differently than that of DePelsmacker, Geuens, and Anckaert (2002). They found that for high-involvement products (i.e., products that are more expensive and require more consideration before purchase), having congruence between the ad and the content of the website improves attitudes, intentions, and

behaviors (and using a reputable website improves this effect further). Ad-website congruency also influences attitudes, intentions, and behaviors for low-involvement products (i.e., lower cost products that do not require much thought prior to purchase), but only when the website does not have an established reputation. The results are consistent with predictions of the Elaboration Likelihood Model of Persuasion (Petty & Cacioppo, 1986). Evaluations of high-involvement items would occur through the central route. Those who are elaborating on the content of the website would expect the ad to be relevant to the website, so an incongruent ad might cause reactance. On the other hand, persuasion for low-involvement items would occur through the peripheral route. Therefore peripheral cues such as reputation of the website would be relied on instead of the relevance of the ad to the website context. In the absence of such a peripheral cue, relevance, or ad congruence, does have an impact. The current study had similarities to that of Shamdasani, Stanaland, and Tan (2001) as they both tested the effectiveness of messages on websites with varying levels of context congruency. The website used in the current study would not have an established reputation as it was created for the purposes of this study. Therefore, based on their results, it was expected that placing messages in a context congruent with the message would increase its effectiveness.

Exposing people to pop-ups ads during an online goal-oriented task, Edwards, Hairong, and Lee (2002) studied the effect of ad/context congruency on perceptions of intrusiveness, which are known to contribute to perceptions of irritation and ad avoidance. They found that although ad/context congruency increases reactance to the ad, it decreased perceptions of intrusiveness and increased perceptions of ad informativeness.

Gunter, Baluch, Duffy, and Furnham (2002) investigated the influence of the congruency between a television ad and the surrounding program context on children's memory of the ad.

They found support for the importance of incongruency, or stimulus distinctiveness, as children demonstrated better memory for non-cartoon ads when they were embedded in a cartoon program environment. Further, in one of their two studies, they also found that cartoon ads were remembered better when presented in a non-cartoon program environment.

The results of the literature relating to the influence of ad/context congruency are mixed, with some researchers supporting the use of congruent ads and contexts and others concluding that it is more effective to utilize ad/context incongruence. The situation is even more confusing given the ease of explaining all these conflicting results with sound psychological phenomena or theory. The current dissertation explored this issue further by examining four levels of context congruency, rather than comparing context congruence to context noncongruence. The current study also contributed to the literature by comparing the relative effectiveness of person matching and context matching in persuasion.

Use of the Internet to Convey Health Communications

Due to its many advantages over traditional media, the Internet is becoming quite popular for conveying health information anonymously to people who may not have access to it otherwise (Robinson, Patrick, Eng, & Gustafson, 1998). The Internet can communicate information to people on a large scale. Billions of people have access to it. It is also relatively inexpensive when compared to the budget necessary for mass mailings or personal counseling sessions. The Internet is also completely anonymous, which is a definite advantage when dealing with health information of a sensitive nature.

People may prefer the anonymity of the Internet if they are uncomfortable discussing health problems in a face-to-face setting. In a college sample, Kypri, Saunders, and Gallagher (2003) found that problem drinkers were more likely to choose an anonymous Internet-based

alcohol use assessment than a face-to-face practitioner-led assessment. It could be that these students were attempting to avoid possible stigmatization that may come from discussing socially sensitive information with another person. The general population also shows such a preference for computer-based assessment (Koski-Jannes & Cunningham, 2001). Using such anonymous assessments could contribute to increased accuracy when reporting sensitive information. In fact, Duffy and Waterton (1984) found that people reported consuming 33 percent more alcohol when disclosing this personal information on a computer compared to their reports in a face-to-face interview.

Although the Internet has the advantage of not requiring a potentially uncomfortable face-to-face encounter, it still offers many advantages of a face-to-face meeting. The Internet is able to gather personal information from individuals then provide immediate, tailored feedback based on this information (Kreuter, Farrell, Olevitch, & Brennan, 2000). For example, an individual who is concerned about their own alcohol use can respond to on-line alcohol use survey questions, and the computer program can calculate and provide the results to the individual, describing whether they have a problem and how bad it might be, and detail what steps they need to seek to help the problem. The Internet is also adaptable; the needs and preferences of a person are likely to change over time, and the Internet can automatically tailor information to their specified needs (Rimal & Adkins, 2003). The Internet is also very interactive, and it allows a person to have many choices and control over their options, which increases the effectiveness of tailored messages (Brug, Campbell, & van Assema, 1999). The Internet offers clear advantages over traditional face-to-face methods for disseminating health information; it has wide reach, low costs, less potential for perceived stigmatization, less time

pressure, greater control by the user, and it is adaptive and has great potential for tailoring health messages to individuals.

Research evaluating approaches to reduce college student binge drinking have used the Internet for its tailoring potential in the past, and it would benefit from continuing to pursue this communications medium in the future (Walters, Miller, & Chiauzzi, 2005). For example, the CHUG (Walters, 2000; Walters, Bennet, & Miller, 2000) is now on the Internet and is called e-CHUG. Alcohol use interventions using the e-CHUG website have motivated heavy college drinkers to cut their alcohol consumption in half (www.e-chug.com). MyStudentBody.com is another website program used to reduce college students' problem drinking; it is available only to students of colleges that are willing to pay for access to it (www.inflexxion.com). These on-line alcohol intervention programs allow students to assess their personal drinking risks and negative consequences they personally experience from drinking (e.g., calories consumed and money spent due to alcohol), and they give students an informational resource on alcohol use and abuse. Saitz et al. (2007) found success at reducing college student drinking using a web-based assessment and feedback intervention. Wallace, Linke, Murray, McCambridge, and Thompson (2006) report an interactive, web-based alcohol treatment intervention was effective at reducing problem behavior in a general adult population (from 33 drinks to 23 drinks per week). Pilling and Brannon (2007), mentioned previously for the study's success at showing the effectiveness of two personally tailored approaches over non-tailored approaches in promoting responsible drinking in college students, used an Internet simulation to convey the responsible drinking PSAs to the students. In all conditions, participants' personal information was collected with anonymous computer-based surveys, and in the most effective conditions the computer program tailored the students' PSAs to their personal information/their self-schema (the less effective

PSAs were not tailored to this personal information). Given the significant advantages offered by the Internet beyond traditional communications media, and the success of online alcohol interventions at decreasing irresponsible drinking among undergraduates, the current studies used an Internet simulation to present responsible drinking PSAs to college students.

Assessing the Effectiveness of Interventions to Reduce Binge Drinking

Ultimately, anti-binge drinking PSAs have the goal of reducing drinking behavior. However, during preliminary stages of research, it is necessary to first assess intervention effectiveness with measures of acceptance of the communication (e.g., do the students report learning from the message, do they find it attractive, etc.) and intentions for drinking behavior (DeJong & Langford, 2002). Traditionally, small-scale interventions are conducted to assess students' perceptions of an intervention before pursuing larger, behavior change studies (Erllich, Haque, Swisher-McClure, & Helmkamp, 2006; Rudy, Rosenfeld, Galassi, Parker & Schanberg, 2001). Effectiveness of the alcohol interventions have been assessed using measures of attitudes toward the intervention (Koski-Jannes & Cunningham, 2001; Kypri, Saunders, & Gallagher, 2003). Beyond alcohol interventions, this technique is used in the area of advertising; copytesting involves asking consumers to rate multiple advertisements and selecting the ad they like the best (Haley & Baldinger, 2000; MacKenzie, Lutz, & Belch, 1986).

Alcohol interventions also focus on changing behavioral intentions as an initial step to changing drinking behavior. Intentions are considered the best predictor of behavior, given the person experiences no barriers to performing the behavior (Ajzen, 1991). Drinking intentions have been found to be strongly positively related to later drinking behavior (Fishbein, Ajzen, & McArdle, 1980; Glindemann, Geller, & Ludwig, 1996; Shim & Maggs, 2005). For example, Glindemann, Geller, and Ludwig (1996) investigated the association between students' drinking

intentions and their behavior measured by Blood Alcohol Content in a field setting. They found positive correlations of .54 for estimations made for a week in the future and .63 for estimations made for later that evening. Shim & Maggs (2005) had participants estimate their future drinking behavior, and they found a strong positive relationship between the estimates and students' self-reported drinking behavior at a later time. Although it would be optimal to be able to demonstrate a change in actual drinking behavior, changes in intentions appear very helpful to demonstrate the effectiveness of drinking interventions.

Overview of the Research

This research investigated factors that may increase the effectiveness of persuasive messages. The research was conducted within the context of discouraging binge drinking among college students. The two studies involved presenting public service announcements (PSAs) to students within a website simulation to observe the effectiveness of the message in terms of student acceptance of the PSA, improved attitudes about responsible drinking, and reduced intentions for binge drinking. Given that students viewing a persuasive message over a mass medium like the Internet will not all be binge drinkers, the researchers were interested in gauging the reactions of all college students in general to the messages. While the messages can serve to discourage binge drinking for those who already drink alcohol, they also can reinforce other students' non-drinking behavior, which is important given that college is a risky time for students to begin drinking.

Experiment 1

The purpose of Experiment 1 was to investigate one factor (Message Personalization) that may increase the effectiveness of PSAs created to discourage binge drinking among college students. Participants were told that they would be evaluating a new website about activities in

town. In a between-subjects design, within a website simulation, participants were exposed to a PSA that was either tailored to their Big Five traits, tailored to their actual self-schema, tailored to their ideal self-schema, or they received a non-tailored control message. This manipulation allowed testing the hypothesis that a higher degree of message personalization will increase the effectiveness of the PSA. After viewing the website simulation and PSA, participants indicated their acceptance of the PSA, and their attitudes and intentions for binge drinking.

Experiment 2

The purpose of Experiment 2 was to investigate three factors (*Message Personalization*, and *Topic Matching* and *Values Matching*, which are two ways to manipulate Message/Context Congruency) that may increase the effectiveness of anti-binge drinking PSAs. Participants were told they would be evaluating a new website about activities in town. In a between-subjects design, within a website simulation, participants received a PSA that either was or was not tailored to their self-schema, and the PSA was presented within one of four possible webpages that varied in level of congruency with the topic and values of the PSA. This allowed testing the influence of these three factors on students' acceptance of the PSA, as well as their attitudes and intentions related to binge drinking.

Predictions

Experiment 1

The aim of Study 1 was to compare the effectiveness of messages to reduce binge drinking among college students at different levels of personalization (i.e., based on the thoroughness of the personality representation of the inventory used). The four message conditions from most to least personalized are the BFI-matched message, the actual self-schema matched message, the ideal schema matched message, and the neutral control message.

Person Matching Main Effect: It was hypothesized that the more thoroughly personalized the message is to the individual, the more effective it will be. Specifically, it was hypothesized that, out of all four conditions, students in the BFI matched message condition would have the most favorable attitudes toward their messages and would have more favorable attitudes and intentions toward drinking responsibly, followed by the actual self-schema matched message being next effective, then the ideal schema matched, and finally the neutral control message as the least effective (having the least favorable attitudes and intentions).

Experiment 2

The aim of Study 2 was to compare the effectiveness of matching the message to the person (using self-schema) and matching the message to the context (i.e., matching the PSA to the topic or values of the web page) and to determine if matching in both ways adds anything above and beyond matching to just one or the other. As in Study 1, Study 2 defined effectiveness in terms of more favorable attitudes toward the PSA and favorable attitudes and intentions for responsible drinking.

Person Matching Main Effect: Based on past literature, it was hypothesized that matching to the person will be more effective than not matching to the person. Therefore, all conditions in which the PSA is matched to the participants' self-schema were expected to result in more favorable attitudes toward the PSA compared to those conditions in which the participants receive a non-matched control message.

Topic Matching Main Effect: It was hypothesized that participants presented with a PSA in the most congruent context will have the most favorable attitudes toward the PSA. Therefore, it was hypothesized that receiving the PSA on a Topic Matching web page would be more effective than receiving the message on a Topic Non-Matching web page.

Values Matching Main Effect: For the same reason, it was hypothesized that receiving the PSA on a Values Matching web page would be more effective than receiving the message on a Values Non-Matching web page.

Person Matching X Topic Matching and Person Matching X Values Matching

Interactions: There were no expected interactions between Person Matching and the two Context Matching factors.

CHAPTER 2 - Experiment 1

Experiment 1 Method

Pretesting of the Messages

The messages used in Experiment 1 were pretested. Refer to Appendix A for the exact wording of the selected messages. The messages were tested to ensure that they were perceived as representative of their intended schema or trait. Each message used in the Big Five trait condition was composed of five short paragraphs (each paragraph dealt with one of the five traits). Several short paragraphs promoting responsible drinking were created to reflect the needs and values of people possessing different levels of each of the Big Five traits. These paragraphs were pretested in order to select the paragraphs that were implemented in the Big Five tailoring condition. Specifically, short paragraphs were written to reflect the traits of Extraversion, Neuroticism, Conscientiousness, Agreeableness, and Openness. Paragraphs were written to address the needs and values of those who possess high levels of the trait while other paragraphs were written to address the needs and values of those who possess low levels of the trait. In other words, for example with the trait of Extraversion, a paragraph was created aimed at those who would be considered extraverted and another was created for those who would be considered introverted. Paragraphs also were created to aim at those considered high and low in Conscientiousness, Neuroticism, Agreeableness, and Openness. Additionally, schema-based messages and control messages similar to those used in past responsible drinking promotion research also were included in the pretesting.

All paragraphs were pretested in a repeated-subjects design. For class credit, thirty General Psychology student participants were tested in classroom settings, in one of several group sessions. Each participant received a pretesting booklet that contained messages designed to represent the Big Five dimensions, schema types, and a control. See Appendix B for a complete pretesting booklet. The researcher informed participants that there was an interest in creating responsible drinking messages tailored to students' personalities. Participants received descriptions of the two poles of each of the Big Five traits (for ten trait definitions total) and descriptions of the four schema types. Then they were given instructions to read each message and provide ratings of where the message fell on several continua. Directly after reading the message, the participant was asked to rate the extent to which it reflects each personality trait or schema type. For example, after reading a paragraph created to reflect Extroversion, the participant was asked to rate to what extent the message was written to aim at people who are Extraverted, Introverted, Open, Closed, Agreeable, Disagreeable, Neurotic, Emotionally Stable, Conscientious, Unmotivated, responsible schema, curious schema, communicative schema, or adventuresome schema. Participants made their ratings on a series of 7-point Likert scales (e.g., anchored at 1 = not at all Extraverted to 7 = completely Extraverted; 1 = not at all responsible schema, 7 = completely responsible schema). They were told to refer back to the descriptions provided on each trait and schema type to help make their ratings. If a participant read an adventuresome schema-based message, it was expected that they would rate this message higher for being adventuresome schema-based than they would rate it as corresponding to any of the other traits or schemas.

The pretest data was examined to confirm that each message was more representative of their intended appeal than any other type of appeal. A series of within-subjects ANOVAs were

performed with the ratings of each message on all possible types of appeals. The ANOVA for each message was significant; each of the messages was found to reflect the intended appeal more than any other type of appeal, all $ps < .05$ (see Table 2). The pretest data was also examined to confirm that the messages equally represented their intended appeal. A one-way within-subjects analysis of variance compared the ratings on the intended appeals as the dependent variable. There was one value being compared for each message, the rating it received on the appeal it was supposed to match. (In other words, the comparison was between the “Responsible Schema” rating for the “Responsible Schema” message, the “Extraversion” rating for the “Extraversion” message, etc.). The main effect for message was non-significant, $F(13, 17) = 0.98, p = .509$, indicating that the messages were equally representative of their intended appeals.

Experiment 1 Overview

Study 1 tested the relative effectiveness of tailoring persuasive health messages to various levels of individuals’ personality, in a website context. The message the participant was exposed to varied in terms of how closely it targeted that individual’s needs and values. It was hypothesized that the more personally tailored a message is to an individual, the more effective it would be in persuading them to drink responsibly (i.e., not binge drink).

Independent Variable

The one independent variable in this study was level of Message Personalization, with four levels: BFI matched, actual self-schema matched, ideal schema matched, and a non-personalized control message. The level of personalization reflects different ways of assessing an individual’s needs and values, and personality tendencies, in order to tailor a message to that individual. See Table 1 for a description of the four schema types. The self-schema matched

condition presented the individual with one of the four possible messages that matched their reported self-schema; the ideal schema matched condition presented participants with one of the four possible messages that matched their reported ideal self-schema; the BFI matched condition presented participants with a 5-part message matched to their level of each of the Big Five traits; and the control condition presented participants with a message designed to be neutral with respect to all other conditions (not reflect any BFI or schema in particular). This message manipulation varied the extent of message personalization such that the BFI-matched message was most personalized, followed by schema-matched, then ideal schema-matched, and then the control as the least personalized.

Dependent Variables

The dependent variables of interest are measures of attitudes toward the message, beliefs about binge drinking, and drinking intentions. The dependent measures assessing attitudes toward the message included items related to how interesting and informative the message is, which were all measured on 7-point Likert scales (1 = Disagree Strongly, 7 = Agree Strongly): “The message on the website about binge drinking was interesting;” “I learned something from the message;” and “I received new information from the message.” Also included were items related to how attractive the message is: “I (1 = dislike / 7 = like) the message;” “I react (1 = unfavorably/ 7 = favorably) to the message;” and “I feel (1 = negatively/ 7 = positively) to the message.” Beliefs about binge drinking were assessed with the following items: “I (1 = like/ 7 = dislike) binge drinking;” “I feel (1 = positive/ 7 = negative) toward binge drinking;” and “Binge drinking is (1 = nice/ 7 = awful).” The drinking intention dependent measure was assessed by asking participants how many alcoholic drinks they plan on having on occasions when they go out drinking, as well as how many alcoholic drinks they plan on having on occasions when they

stay in drinking, in the next week. Drinking while in and drinking while out were measured separately because drinking out may be influenced by a variety of social factors, while drinking in may be determined more by personal attitudes toward drinking. Because drinking in different contexts may be influenced by different factors, it was important to explore the effects of the PSA on intentions in both drinking situations.

Again, attitudes and intentions toward the behavior were measured because intentions are considered the most proximal predictor of behavior. In fact, intentions are considered sufficient for producing behavior if no barriers exist for performing the behavior (Fishbein et al., 2001). Intentions related to drinking have also been found to be strongly positively related to actual drinking behavior (Fishbein, Ajzen, & McArdle, 1980; Glindemann, Geller, & Ludwig, 1996; Shim & Maggs, 2005). Attitudes are thought to influence behavior either directly (Eagly & Chaiken, 1998; Petty & Wegener, 1998b) or through their influence on intentions (Ajzen & Fishbein, 1980). Further, attitudes toward the message are also considered indicators of message acceptance (a first step for message effectiveness). When conducting a preliminary study to test the effects of a communication intervention, it is traditional to assess attitudes toward the message/intervention before conducting a larger behavior change study (e.g., Erlich, Haque, Swisher-McClure, & Helmkamp, 2006; Rudy, Rosenfeld, Galassi, Parker, & Schanberg, 2001). In fact, attitudes about alcohol interventions have been used to assess intervention effectiveness in research with both college students (Kypri, Saunders, & Gallagher, 2003) and a wider audience (Koski-Jannes & Cunningham, 2001). Often used in advertising, this technique of copytesting involves having an audience view several advertisements and asking them to select their favorite one because consumers' attitudes toward the advertisement is accepted as the best predictor of purchasing behavior (Haley & Baldinger, 2000; MacKenzie, Lutz, & Belch, 1986).

Therefore, as this is a preliminary study assessing the effectiveness of various responsible drinking interventions, attitudes toward the message as well as drinking intentions are used as indications of message acceptance and message effectiveness.

Although participants' intentions for drinking behavior were measured, given how much drinking is an integral part of college culture, the brief one-time messages were not expected to have a strong effect on drinking intentions. Therefore, the primary dependent measures were the participants' ratings of how interesting, informative, and attractive the messages are (participants' attitudes toward the message) and their beliefs about whether binge drinking is a good or bad behavior.

Procedure

Two-hundred sixteen general psychology undergraduates served as participants and received class credit for their time. Participants signed-up to participate on a voluntary basis. The sign-up sheets displayed the study title "Life in Manhattan Website Evaluation" and described the study as involving the student viewing a website about things to do for fun in Manhattan, filling out multiple surveys regarding their thoughts about the website and their own health-related behaviors (particularly eating and drinking behavior, including their behavior relating to drinking alcohol). See Appendix C for the sign-up sheet. Individuals were required to be at least 18 years old to participate. While there was an expectation that many of the participants would not be of legal drinking age, past research has consistently shown that underage people do not have concerns about reporting their drinking behavior. It was further expected that underage participants would feel comfortable enough to report their behavior on a topic that may be of a potentially sensitive nature due to the anonymous nature of the computer-based data collection.

The data was collected in several group sessions; up to nine students were able to participate at one time. When participants arrived for the study, they were randomly assigned to a computer work station which would determine their Message Personalization condition. Before participating, students signed two consent forms (one for the experimenter to retain as a record and one for the participant to take with them). See Appendix D for the consent form. Each computer terminal contained a series of computer-based surveys and a website simulation containing descriptions of activities and services available in town. Specifically, the website simulation had links to web pages with information about local bars, health-related organizations, spiritual organizations, and points of interest in Manhattan. After signing the consent forms, participants were given verbal instructions to begin viewing the website. All further instructions were contained within the website simulation.

Pre-intervention surveys. The instructions on the first page provided the cover story. It told participants that the experimenters were attempting to implement the use of a new website about activities available in town. Participants were informed that they would be asked to view the website and evaluate it so the experimenter could determine if college students find the website interesting and useful. The participants also completed some demographic information such as age, gender, and fraternity/sorority membership. After reading the instructions and completing the demographics, the participant clicked a button that took them to the next page.

The order of the following two web-based surveys depended on the condition to which the participant had been randomly assigned. These two surveys included a schema selection (including items assessing both self-schema and ideal schema) and the BFI. Whichever condition they were assigned would be the first survey they completed. Specifically, the order of surveys for those in the self-schema matched condition were schema selection (where they were

asked to first indicate their self-schema, then their ideal schema) followed by the BFI. Those in the ideal schema condition received the schema selection survey (though they were asked to first indicate their ideal schema, then their self-schema) followed by the BFI. Those in the BFI matching condition completed the BFI, then the schema selection (with self-schema followed by ideal schema items as it seemed more straightforward for them to select a schema they already possess compared to a schema they would ideally like to have). Those in the control condition received the schema selection survey followed by the BFI because it was thought that the simple selection of a schema would be less likely to influence responses to the more detailed BFI than vice versa. In addition to asking about more detailed aspects of personality, the BFI is a longer survey, so the participant would be required to spend more time thinking about their needs and values with that survey. Thus, thoughts about more detailed aspects of their personality and the longer time reflecting on their specific needs and values were expected to more strongly influence the global selection of personality using the schemas than vice versa.

The schema selection survey contained a large graphic of the four self-schema types. The graphic was divided into four boxes, with each box containing one schema type description. As in past research using these self-schemas, each box (or schema card) contained four trait adjectives, pictures of people whose activities and attire reflect that schema type, and a few sentences describing the values of people with that schema type. See Table 1 for descriptions of the four schema types. The schema types were displayed on the computer. The participants were instructed to familiarize themselves with all four schema types and then consider which one of the four schema (or personality) types best describes them as well as which personality type they would most like to have. As part of the cover story, they were told that making this indication would allow the researcher to determine if the website is interesting to different types

of people. At the bottom of the page, participants were prompted to indicate which one of the four schema types best fits their own personality as well as which of the self-schemas is most representative of the type of person they would most like to be (as mentioned in the previous paragraph, the order of these indications depended on which condition the participant is assigned). The participants' responses to these questions allowed the computer program to tailor the message to their self-schema or ideal self-schema if they were randomly assigned to either one of those conditions. Then, participants clicked on a button to take them to the next page.

Participants were asked to complete the Big Five Inventory (Appendix E). The BFI contains 44 items that participants respond to on 5-point Likert scales (1 = Disagree Strongly, 5 = Agree Strongly). Each item is a description of an aspect of a person's disposition or personality (e.g., "is talkative," "is a reliable worker," "worries a lot"). Participants were instructed to identify a number on the scale for each item to indicate their level of agreement that the item describes them. The BFI is comprised of five subscales that measure major personality traits: Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness. Participants were told that they were being asked to complete the survey because the experimenters are interested in knowing more about the students who are evaluating the website.

Participants' responses to the BFI items allowed the computer program to tailor a message to the participant if they had been randomly assigned to the BFI matched condition. The messages for participants in the BFI condition were comprised of 5 short paragraphs (1 for each trait). Further, if the BFI scoring indicated the person was high in a trait, they received a different paragraph for this trait than had it been indicated that the person was low in that trait. The participant was identified as high or low on a trait by a simple median split. When completed with the BFI items, the participant clicked to the next page.

The next page was an Activities and Interests Survey (Appendix F). Participants were instructed to complete the survey keeping in mind the activities they take part in in-town. The cover story was that the website they would be viewing involved activities and services available in town, the researchers were interested in gaining a better understanding of their current interests and behaviors. They were asked to indicate how many times a week they engaged in each behavior. They were asked to report on relevant behaviors like how many times a week they stay in drinking alcohol or go out drinking alcohol and how many drinks they have on each of these occasions. Distracter items included activities such as exercising, playing pool, going to the library, and visiting the health center. This survey allowed the researcher to obtain the participants' baseline drinking behaviors. After completing this survey, they clicked on a button that took them to the main website.

Personality Matching PSAs. The next page was the homepage of the website simulation, and it welcomed the students and contained an introduction to the website. The students were told to look through the website links in a consistent manner so as to not miss any information because they would be asked about it later. The homepage was split-screen. The larger right-hand panel contained the welcome and instruction, while the smaller left-hand panel contained the links to pages relating to drinking establishments, points of interest, health organizations, and spiritual organizations. Participants were allowed to browse through the links at their leisure. On the last available link (the information on drinking establishments), the participant was exposed to one of the messages designed to discourage binge drinking. The screen on this last link was split; the drinking establishment information was on the larger panel on the right side, while the responsible drinking message was contained in the smaller, left-side panel. Depending on which condition they had been randomly assigned, the participant received either a message

matched to their self-schema, a message matched to their ideal schema, a message matched to their BFI, or a non-matched control message.

For example, if the participant was randomly assigned to the self-schema matched condition and they selected the “Adventuresome” self-schema, they were presented with a message within the website simulation like the following: “You value being a competitive, skillful, spontaneous, and adventuresome person. One or two drinks should not interfere with your ability to show off your skills and win competitions; however, binge drinking will negatively impact such valued aspects of your life. While a couple of drinks might help you settle some nerves before attempting your next adventure, too many drinks may seriously hurt your ability to exhibit your true skills and you may lose your competitive edge. Too much alcohol may make you spontaneous in a bad way -attempting a dangerous stunt you normally wouldn’t try. Alcohol is actually a depressant, and when too much is consumed, it dulls the senses and slows a person down, thereby making it impossible for them to act spontaneously. Binge drinking actually limits the amount of fun and excitement you can experience in a night. Drinking responsibly will help you hold on to your skills and competitive edge. Live the Exciting Life, Don’t Binge Drink!” On the other hand, if the participant selected any of the other three self-schema types, he/she was presented with a message tailored to those values. If the person was randomly assigned to the ideal schema condition, they would receive a message matched to their selected ideal schema.

If the participant was randomly assigned to the BFI matched condition, they received a five paragraph message tailored to their level of each of the Big Five traits. Specifically, if the participant was Extraverted they received the following paragraph: “You tend to be an outgoing, friendly person. Binge drinking may make you less friendly and approachable, or it may make

you even more social, but in a bad way. It could push you over the top and make you loud and obnoxious, and less socially effective. You don't need alcohol to help you be social." On the other hand if the participant was Introverted, they received the following paragraph: "You tend to be relatively quiet and prefer the company of close friends. Having a drink or two may help you be social, but binge drinking may make it easier for others to break through your social boundaries or lead you to do something silly that people will be talking about the next day." They also received four other paragraphs for the other four traits, which worked similarly, with there being a high and low level version for each of those paragraphs. For example, if the participant was high in each of the Big Five traits, they would receive the following message:

"You tend to be an outgoing, friendly person. Binge drinking may make you less friendly and approachable, or it may make you even more social, but in a bad way. It could push you over the top and make you loud and obnoxious, and less socially effective. You don't need alcohol to help you be social." [High Extraversion]

"You sometimes tend to feel moody and anxious, and you worry about a lot of things. While having a couple of drinks may help to take the edge off and help you relax, binge drinking makes some people anxious and tends to contribute to serious problems that anyone would worry about. Avoid more serious worries." [High Neuroticism]

"You tend to be reliable and organized. While having a couple of drinks shouldn't affect the care you take in your daily activities, binge drinking can get you in trouble by making you less able to focus on details and allowing you to let things fall through the cracks. Keep your life organized." [High Conscientious]

"You tend to be considerate, kind, and cooperative. Binge drinking can make you less likely to take other people's feelings into consideration and more likely to argue or start fights with others, which could permanently hurt your friendships. You value being kind and considerate to others." [High Agreeableness]

“You tend to like new and creative activities and ideas. While a couple drinks may even contribute to your creative experiences, binge drinking can reduce coordination and mental acuity, thus limiting your capacity for enjoying new things. Keep your mind and body ready for new experiences. Don’t binge drink!” [High Openness]

Those randomly assigned to the control condition received the following message:

“Drinking to excess leads to many problems in a person’s life. Different types of people experience different types of problems, but most people who drink to excess experience a variety of difficulties. Binge drinking leads to problems like missing class and getting behind in school work, unplanned sexual activity, unintentional injuries that require medical attention, arguments with friends, regrets over things you did while intoxicated, and worries associated with forgetting where you were or what you did. All of these problems can seriously interfere with a person’s quality of life. For example, it can get them killed, in trouble with the police, kicked out of school, or it can damage important relationships. Drinking in moderation allows a person to carry on life normally, without the extra hassles that come from excessive drinking. People already have enough to think about in their life from school, work and family, you really don’t need anything more like having these issues to think about, not to mention getting sick or hungover. Don’t binge drink!” Although this control message might have had some points that overlapped with issues that are particularly relevant for certain personalities or schemas, it was designed to be general and not focus very much on any one specific point like the personality matching messages were. Rather, the control described several negative consequences that may arise from excessive drinking.

When the participant finished viewing the website simulation, they clicked to continue on to complete more computer-based surveys.

Post-intervention surveys. The first survey that participants completed after viewing the website was an evaluation of the website (Appendix G). It said “Thanks a lot for viewing our new website. Now we would really appreciate it if you let us know what you think about it.” This survey asked their opinions on each link and the website as a whole, and it asked whether they would use a website like it to select an activity for the daytime or evening.

The next survey asked participants to indicate their intended behaviors over the next week (Appendix H). It said “You have been viewing a website and reading about several activities to do in Manhattan. You may not have been aware of some of these options before, so we would like to see if you are planning on doing any of these behaviors in the near future. Please indicate how many times you intend to engage in the following behaviors in the next week by placing a number in the space provided.” Some questions asked them to indicate their intended drinking behavior. For example, they were asked how many drinks they think they will have on occasions in which they go out drinking and how many drinks when staying in drinking. This indication allowed the researcher to determine if exposure to the message influenced drinking intentions. Distracter items included the same behaviors they were asked about in the original “Activities and Interests Survey” (e.g., going to the library, exercising, going out dancing).

Next, participants completed a survey assessing their attitudes about the responsible drinking message they read (Appendix I). The dependent measures assessing attitudes toward the message included ratings of how interesting and informative the message is [“The message on the website about binge drinking was interesting;” “I learned something from the message;” “I received new information from the message.” all measured on 7-point Likert scales (1 = Disagree Strongly/ 7 = Agree Strongly)] and ratings of how attractive the message is [“I (1 =

dislike / 7 = like) the message;” “I react (1 = unfavorably/ 7 = favorably) to the message;” “I feel (1 = negatively/ 7 = positively) to the message.”].

Next, beliefs about how bad of a behavior binge drinking is were assessed with the following items (Appendix J): “I (1 = like/ 7 = dislike) binge drinking;” “I feel (1 = positive/ 7 = negative) toward binge drinking;” and “Binge drinking is (1 = nice/ 7 = awful).”

Next, participants completed the Social Desirability Scale (Appendix K) and answered questions assessing suspicion of the purpose of the study (Appendix L).

After completing all surveys, the participants were debriefed with a statement on the computer screen (Appendix M). They were told “In this experiment, we were interested in how people interpret messages concerning health–relevant behaviors (in particular, drinking alcohol), depending upon their own personality. We predicted that individuals would respond best to the aspects of a message that best reflected their personality.” Participants were also given the experimenter’s contact information and were told that they should talk to the experimenter if they had concerns about their own or a friend’s alcohol use.

Experiment 1 Results

Participant Characteristics

Of the 216 undergraduate participants, 165 (76.4%) were female, and 51 (23.4%) were male. Also, 201 (93.1%) were underage, and 15 (6.9%) were of legal drinking age. Participants’ average age was 19.0 years ($SD = 3.2$). While 120 students (55.6%) were not binge drinkers, 96 students (44.4%) were binge drinkers. Additionally, the random assignment was successful. Each group was observed to have similar mean age as well as similar distributions of genders, binge/nonbinge students, and underage/of age students.

Behavioral Intention

Two 4 (Message Personalization Type: Big-Five matched/self-schema matched/ideal schema matched/control) X 2 (Gender: males/females) between-subjects Analyses of Covariance (ANCOVA) were performed on the behavioral intention measures. Again, intentions for drinking while in and drinking while out are explored separately because drinking in these different contexts may be influenced by separate factors, and there was interest in gauging the effectiveness of the PSA on intentions for both types of drinking situations. One ANCOVA was performed on the dependent measure of how many alcoholic beverages the participant intended to drink on occasions when they go out drinking during the next week³⁴. The two covariates in the analysis included a pre-treatment indication of the number of alcoholic beverages typically consumed by the participant when going out drinking⁵ and the participant's social desirability score⁶. Consistent with expectations, the ANCOVA was not significant for Message Personalization Type [$F(3, 206) = 0.64, ns; \text{partial } \eta^2 = .009$]. Those in the BFI matching ($M = 3.68, SE = 0.60$), self-schema matching ($M = 2.66, SE = 0.69$), ideal schema matching ($M = 3.06, SE = 0.64$), and control ($M = 2.59, SE = 0.66$) all intended to drink a similar amount on occasions when going out drinking in the next week. There was also no main effect for Gender [$F(1, 206) = 0.001, ns; \text{partial } \eta^2 = .000$]. After controlling for typical number of drinks consumed (which

³ Drinking intentions were analyzed as typical number of drinks consumed on each occasion when going out drinking or staying in drinking because the definition of binge drinking is based on a number of drinks consumed on an occasion. The number of drinks consumed in one sitting is an important indication of problem drinking because when a person reaches the number of drinks considered to be "binging", the likelihood they will experience negative consequences of drinking greatly increases.

⁴ Although a majority of participants were underage, they still found the phrase "going out drinking" to be meaningful, as more underage participants indicated that they go out drinking than stay in drinking. While the phrase was clearly meaningful to participants, the researchers are not exactly sure how it was interpreted (e.g., using a fake id to gain access to a bar, attending a fraternity or house party, etc.).

⁵ Pre-intervention drinking was covaried to control for initial differences in drinking behavior.

⁶ The participant's social desirability score was covaried because some students might be motivated to adjust (lower) their actual drinking behavior to appear more responsible and students might report feeling positively toward the message just to seem helpful and socially responsible.

is related to gender, such that males tend to drink more than females), males ($M = 2.99$, $SE = 0.59$) and females ($M = 3.00$, $SE = 0.31$) intended to drink a similar amount when going out drinking in the next week. Refer to Table 3 for means and standard errors for this analysis.

A second ANCOVA was performed on the dependent measure of how many alcoholic beverages the participant intended to drink on occasions when staying in drinking during the next week. The two covariates in the analysis included a pre-treatment indication of the number of alcoholic beverages typically consumed by the participant when staying in drinking and the participant's social desirability score. Again, consistent with expectations, this ANCOVA was not significant for Message Personalization Type [$F(3, 206) = 0.44$, ns ; partial $\eta^2 = .006$]. Those in the BFI matching ($M = 1.69$, $SE = 0.44$), self-schema matching ($M = 1.02$, $SE = 0.50$), ideal schema matching ($M = 1.07$, $SE = 0.47$), and control ($M = 1.30$, $SE = 0.49$) all intended to drink a similar amount on occasions when staying in drinking in the next week. There were also no main effects for Gender [$F(1, 206) = 1.00$, ns ; partial $\eta^2 = .005$]. After controlling for typical number of drinks consumed (which is related to gender such that males tend to drink more than females), males ($M = 1.52$, $SE = 0.43$) and females ($M = 1.02$, $SE = 0.23$) intended to drink a similar amount on occasions when staying in drinking in the next week. Refer to Table 4 for means and standard errors for this analysis. See Tables 5 and 6 for the complete ANCOVA tables corresponding to the analyses described above. Not surprisingly, participants' intentions for drinking (both while going out or staying in) were not influenced by the Message Personalization treatment. Given that drinking alcohol can be an integral part of a college student's life, it is not surprising that a one-time presentation of a message designed to discourage binge drinking will not influence changes in the students' intended behavior.

Beliefs about Binge Drinking and Attitudes Regarding Message Persuasiveness

A 4 (Message Personalization Type: Big-Five matched, self-schema matched, ideal schema matched, control) X 2 (Gender: males, females) between-subjects Multivariate Analysis of Covariance (MANCOVA) was performed on the dependent measures assessing participants' attitudes toward the message and beliefs toward binge drinking. These dependent measures included a composite of three items assessing participants' beliefs about how good or bad binge drinking is ($\alpha = 0.95$) [Exact wording of the three items in the composite: "I (1 = like/7 = dislike) binge drinking," "I feel (1 = positive/7 = negative) toward binge drinking," and "Binge drinking is (1 = nice/7 = awful)"], a composite of three items measuring how interesting and informative the message is ($\alpha = 0.78$) [Exact wording of the three items in the index are "The message on the website about binge drinking was interesting," "I learned something from the message," and "I received new information from the message" all measured on 7-point Likert scales (1 = Disagree Strongly / 7 = Agree Strongly)], and a composite of three items assessing how attractive or likeable the message is ($\alpha = .86$) [Exact wording of the three items in the composite: "I (1 = dislike/7 = like) the message," "I react (1 = unfavorably/7 = favorably) to the message," and "I feel (1 = negatively/7 = positively) to the message"]. The three covariates included in the analysis were a pre-treatment indication of the number of alcoholic beverages typically consumed by the participant when going out drinking, a pre-treatment indication of the number of alcoholic beverages typically consumed by the participant when staying in drinking, and the participant's social desirability score. The MANCOVA was significant for Message Personalization Type [Wilks' $\Lambda = .90$; $F(9, 494) = 2.42$, $p < .01$; partial $\eta^2 = .034$] and Gender [Wilks' $\Lambda = .95$; $F(3, 203) = 3.96$, $p < .01$; partial $\eta^2 = .055$]. Refer to Table 7 for the complete MANCOVA table corresponding to this analysis.

To further explore the significant effects, a series of three 4 (Message Personalization Type: Big-Five matched, self-schema matched, ideal schema matched, control) X 2 (Gender: males, females) between-subjects ANCOVAs were performed on the individual dependent measures related to beliefs about binge drinking and attitudes toward the message. The covariates in these ANCOVAs were the same as used in the MANCOVA (i.e., a pre-treatment indication of the number of alcoholic beverages typically consumed by the participant when going out drinking, a pre-treatment indication of the number of alcoholic beverages typically consumed by the participant when staying in drinking, and the participant's social desirability score).

Beliefs about Binge Drinking

Belief about Binge Drinking Being a Good or Bad Behavior. The ANCOVA related to participants' beliefs about binge drinking being a good or bad behavior was significant for Message Personalization Type [$F(3, 205) = 3.30, p < .05$; partial $\eta^2 = .046$] and Gender [$F(1, 205) = 10.12, p < .01$; partial $\eta^2 = .047$]. Again, the exact wording of the items in the composite were "I (1 = like/7 = dislike) binge drinking," "I feel (1 = positive/7 = negative) toward binge drinking," and "Binge drinking is (1 = nice/7 = awful)." Refer to Table 8 for means and standard errors for this analysis. Participants who received the self-schema matched message ($M = 5.95, SE = 0.20$) believed binge drinking to be a worse behavior to engage in than those receiving the ideal schema matched message ($M = 5.31, SE = 0.19$) or the Big-Five matched message ($M = 5.27, SE = 0.17$). Those who received the control message ($M = 5.78, SE = 0.19$) believed binge drinking to be a worse behavior compared to those receiving the Big-Five matched message. Males ($M = 5.90, SE = 0.17$) thought that binge drinking is a worse behavior than females ($M = 5.26, SE = 0.09$). See Table 9 for the complete ANCOVA table corresponding to the analysis.

Attitudes about Message Persuasiveness

How Interesting and Informative the Message Is. The ANCOVA related to participants' perceptions of how interesting and informative the message is was significant for Message Personalization Type [$F(3, 205) = 3.18, p < .05$; partial $\eta^2 = .044$]. Again, the exact wording of the items was "The message on the website about binge drinking was interesting," "I learned something from the message," and "I received new information from the message" all measured on 7-point Likert scales (1 = Disagree Strongly / 7 = Agree Strongly). Refer to Table 10 for means and standard errors for this analysis. Participants receiving the self-schema matched message ($M = 4.54, SE = 0.23$) or the Big-Five matched message ($M = 4.55, SE = 0.20$) thought the message was more interesting and informative than those who received the control message ($M = 3.73, SE = 0.22$). Those receiving the ideal schema matched message ($M = 4.18, SE = 0.21$) did not differ from any groups in their perceptions of how interesting and informative the message was. There was no main effect for Gender [$F(1, 205) = 1.79, ns$; partial $\eta^2 = .009$]. Females ($M = 4.40, SE = 0.10$) and males ($M = 4.10, SE = 0.20$) perceived the message as equally interesting and informative.

How Attractive the Message Is. The ANCOVA performed on the index related to how attractive the message is was not significant for Message Personalization Type [$F(3, 205) = 0.31, ns$; partial $\eta^2 = .005$]. The exact wording of the items was "I (1 = dislike/7 = like) the message," "I react (1 = unfavorably/7 = favorably) to the message," and "I feel (1 = negatively/7 = positively) to the message." Refer to Table 11 for means and standard errors for this analysis. Those receiving the self-schema matched message ($M = 5.14, SE = 0.21$), ideal schema matched message ($M = 4.26, SE = 0.19$), Big-Five matched message ($M = 5.01, SE = 0.18$), and non-matched control message ($M = 5.13, SE = 0.20$) thought the message was similarly attractive. There was also no significant main effect for Gender [$F(1, 205) = 0.11, ns$; partial $\eta^2 = .001$].

Females ($M = 5.17$, $SE = 0.09$) and males ($M = 5.10$, $SE = 0.18$) thought the message was similarly attractive. See Tables 12 and 13 for complete ANCOVA tables corresponding to these analyses.

Suspicion Questions

Of all participants ($n = 216$), when asked if they were suspicious of anything in the experiment, 87.5 % answered “No.” On the follow-up question asking the participant to describe what they had been suspicious of, some participants indicated that there had been more questions about drinking alcohol than they expected, although none of the 27 participants who indicated suspicion described the real purpose of the experiment (tailoring the responsible drinking message to their personality). When prompted to indicate to what extent they thought the purpose of the experiment dealt with the drinking message, participants on average indicated that it was about equally likely that the purpose did or did not deal with the drinking message ($M = 4.66$, $SD = 1.82$). It is surprising that this number was not higher given that instructions on the survey assessing attitudes toward the message stated that one of the interests of the researchers involved presenting PSAs on the website, and that is why they were being asked about the message. Thus, when participants indicated they thought the purpose of the experiment dealt with the drinking message, they were not telling us anything more than what they had been told during the experiment.

Next, when prompted to indicate the extent they thought the purpose of the experiment dealt with the message being tailored to their earlier responses related to personality and behavior, participants reported that they had not particularly thought this was the purpose ($M = 3.79$, $SD = 1.74$). In both questions, the participants responded near the midpoint of the scale (near 4), so it appears they were not suspicious of the purpose of the study. Further, when asked

to describe what they thought the purpose had been, none of the participants were able to describe the real purpose of the experiment.

Experiment 1 Discussion

In Study 1, four groups were compared based on a Message Personalization treatment; participants received either a Big-Five Matched message, a self-schema matched message, an ideal schema matched message, or a non-matched control message. The Message Personalization manipulation influenced participants' ratings of how interesting and informative the message was and their beliefs about how good or bad of a behavior binge drinking is. Participants who received the self-schema matched message believed binge drinking to be a worse behavior to engage in than those receiving the ideal schema matched message or the Big-Five matched message, and participants receiving the self-schema matched message or the Big-Five matched message thought the message was more interesting and informative than those who received the control message. However, the Message Personalization manipulation did not influence participants' ratings of how attractive/likeable the message is or their intended drinking behavior for the next week (when going out or staying in). Males and females were also compared on these dependent measures, and when controlling for the amount of alcohol typically consumed on drinking occasions, gender influenced participants' ratings of how good or bad a behavior binge drinking is (males thought it was a worse behavior to engage in), but not their ratings of how interesting or informative the message was, how attractive the message was, nor their intended drinking behavior (for staying in or going out drinking) for the next week.

Comparative Utility of Matching to Self-Schema vs. Big Five

The current study compared self-schema matching to Big Five matching because it was thought that matching to participants' levels of the Big Five personality traits would be a more

comprehensive way of tailoring a message to the person, thus it was expected to be more effective than merely matching to one of four possible self-schema types. The results suggest that matching to the Big Five is no more effective than matching to the simple selection of a self-schema type. In fact, participants who received the self-schema matched message believed binge drinking to be a worse behavior to engage in than those receiving the Big-Five matched message. The Big-Five tailoring was not effective in persuading participants that binge drinking is a bad behavior.

Also, related to participants' reactions to the messages, those receiving the self-schema matched message or the Big-Five matched message thought the message was more interesting and informative than those who received the control message. While in this comparison self-schema matching and Big Five matching were similarly persuasive, the fact that the Big Five matching was not rated significantly more interesting or informative suggests that it is not worth spending the extra time and effort to match to the Big Five compared to the simple self-schema selection. For ratings of how attractive the message was, those receiving the self-schema matched message or Big-Five matched message thought the message was similarly attractive. Participants in the self-schema matching group and the Big-Five matching groups also intended to drink a similar number of alcoholic beverages when going out or staying in during the next week.

In all instances, tailoring to the Big Five personality traits is no more effective than tailoring to the self-schema. This lends great support for the use of the simple self-schema selection as a personality assessment tool in this type of research. Making a selection of one of four possible self-schema types is much simpler, faster, and more enjoyable for participants than completing a 44-item survey. While the results suggest that personalizing a message increases

its effectiveness, the results also appear to suggest that there may be some threshold of personalization that is required to increase message effectiveness. The extra effort required to tailor more comprehensively to the Big Five traits is not necessary. Matching to the needs and values of one of four simple self-schemas is sufficient to increase message effectiveness.

An alternate way to interpret these results may be related to the face validity of the self-schemas versus the Big Five dimensions. While the Big Five better represents who the person actually is, it may be that aspects of this representation are not actually part of the person's self-concept. For example, some of the Big Five dimensions have threatening qualities. In effect, a person's self-concept may not include being Closed, Neurotic, and Disagreeable, even though that is what scientists would describe them as being. It may be that individuals would tend to describe themselves in a manner that is more similar to one of the self-schemas (e.g., as responsible, or adventurous). In other words, while the Big Five matching may more scientifically represent the individual's personality, it may not do a better job of matching to their self-concept (i.e., the way they see themselves). Future research should further investigate the extent to which a person's actual self, as defined by a psychometrically rigorous personality scale, is similar to their self-concept. Research could determine if these alternate ways of describing the self are always the same, or if they are not, under what conditions they are different. For example, the Extraversion/Introversion dimension may be more a part of a person's self-concept than the Openness/Closedness dimension. Further research could identify implications of these potential differences. For example, is it better to tailor a persuasive message to who an individual actually is (as determined by a scientific scale), or is it better to tailor to who they think they are (as represented by self-schema)? In other words, if a person is closed-minded but considers himself/herself to be open-minded, should the message target open-

or closed-minded values? Or, is it better to tailor to only the scientific personality dimensions that are consistent with the person's self-concept? The current research suggests that individuals' self-perceptions may be as important as their actual personality dimensions.

Utility of Matching to Actual Self-Schema vs. Ideal Self-Schema

Matching to the ideal self-schema was also investigated in this study as another possible way to tailor to personality instead of using the actual self-schema. It was thought that tailoring to the ideal self-schema may be helpful in research related to undergraduate binge drinking because students might drink to transform into someone more like their ideal self. In fact, Treise, Wolberg, and Otnes (1999) mentioned drinking for transformation, or escape from reality, as one of three major reasons undergraduates drink. Also, the ideal self-schema condition was included because very little research has compared the utility of matching to the ideal schema versus actual self-schema, and no research had done so in the context of persuading undergraduates to drink responsibly.

The current results suggest that matching to the ideal self-schema is no more helpful than matching to the actual self-schema. Participants who received the self-schema matched message believed binge drinking to be a worse behavior to engage in than those receiving the ideal schema matched message. Those in the actual self-schema matching group and the ideal schema matching groups rated the message as similarly interesting and informative; however, the actual self-schema matching group rated the message significantly more interesting and informative than the control, while the ideal schema matching group rated it no differently from the control. Those receiving the actual self-schema matched message and those receiving the ideal schema matched message also thought the message was similarly attractive and they reported similar intentions for their drinking behavior (both for staying in and going out drinking) in the next

week. These results show that matching to the ideal self-schema does not improve message persuasiveness compared to matching to the actual self-schema, which has already been shown to be effective in past research studies (Pease, Brannon, & Pilling, 2006; Pilling & Brannon, 2007).

General Utility of Self-Schema Matching

While the results clearly indicate that actual self-schema matching should not be replaced by Big-Five matching or ideal schema matching, the actual self-schema matching manipulation affected some attitudes and beliefs more than others. Schema matching was effective at increasing participants' beliefs that binge drinking is a bad behavior to engage in compared to the other types of matching. Those receiving a schema matching message also believed that the message was more interesting and informative than the control. However, those receiving a schema matched message did not believe that the message was more attractive than did those receiving the control. It does not seem problematic to the researchers that these participants did not think the message was more attractive than the control given that 1) the means are in the correct direction and 2) they did think that the message was more interesting and informative, and schema matching was the best appeal for convincing students that binge drinking is a bad behavior in which to engage. While these participants might not state they find the message attractive, it still influenced them.

It should be noted that although self-schema matching was more effective than the other types of matching at persuading students that binge drinking is a bad behavior, it was not better than the control at doing so. Possibly, this result is due to the control message being somewhat more compelling than a normal control message would be in that it presented strong arguments rather than neutral filler information. The control message used in the current study listed very

specific negative consequences experienced by binge drinkers (i.e., “Binge drinking leads to problems like missing class and getting behind in school work, unplanned sexual activity, unintentional injuries that require medical attention, arguments with friends, regrets over things you did while intoxicated, and worries associated with forgetting where you were or what you did. All of these problems can seriously interfere with a person’s quality of life. For example, it can get them killed, in trouble with the police, kicked out of school, or it can damage important relationships.”). This information was included in the control message merely to increase its length. This increased length was necessary given the required length of the Big-Five message which had to tailor to five separate dimensions. A normal control would usually be much vaguer about the problems that binge drinking causes, like in the control message used in Study 2 (i.e., “Drinking to excess leads to many problems in a person’s life. Different types of people experience different types of problems, but most people who drink to excess experience a variety of difficulties. These can interfere with the person’s quality of life.”). While the specific information was included merely to increase length, including it probably made the message much more compelling and thought-provoking. However, while those in the schema matching condition did not differ from the control in beliefs about how bad of a behavior binge drinking is, those in the schema matching condition did rate the message as significantly more interesting and informative than the control.

Average Drinking Behavior, Beliefs about Drinking, and Attitudes toward the Message

It also should be noted that in looking at the overall means for the dependent measures, it appears participants tended to believe, on average, that binge drinking is a somewhat bad behavior in which to engage ($M = 5.40, SD = 1.44$). Participants also, on average, believed that the message was slightly interesting and informative ($M = 4.33, SD = 1.34$). This is consistent

with past research reporting participants' ratings of how interesting such anti-binge drinking PSAs are (Pilling & Brannon, 2007). The participants, on average, perceived the message to be somewhat attractive overall ($M = 5.15$, $SD = 1.21$). It is promising that students are receptive to responsible drinking PSAs and they are willing to report finding the messages attractive given that 44.4% of participants (96 of 216) in this study qualified as binge drinkers. This was determined by summing the number of males who indicated they drink five or more drinks on an occasion (either when staying in or going out drinking) and the number of female participants who indicated they drink four or more drinks on an occasion, dividing by the total number of participants, then multiplying by 100. Separating the genders, 60.8% (31 out of 51) of male participants qualified as binge drinkers, and 39.4% (65 out of 165) of female participants qualified as binge drinkers. When students go out drinking, males tended to drink 6.1 alcoholic beverages and females consumed 3.9 drinks on average, suggesting there is room for improvement in terms of reducing college students' drinking behaviors.

Limitations / Implications for Future Research

Effectiveness of the drinking interventions was assessed with measures related to attitudes toward the message, beliefs about the behavior, and intentions toward the behavior. No indications of actual behavior change were collected. While these measures were appropriate given the preliminary nature of the research study, future research should pursue changes in actual drinking behavior. Reports of drinking behavior may be assessed by asking the participants to keep a drinking journal, and bringing it to the laboratory for the study. This type of study would be quite intensive as far as how much is asked of the participant. It would also require a longitudinal design, in order to assess change in behavior over time as a result of the intervention.

It is suggested that future research not pursue Big Five matching in responsible drinking interventions given it was not found to be superior to self-schema matching in the current study. Future research should continue to assess student reactions to drinking interventions. It is recommended, if the study does not require it, to use more brief messages than used in the current study. Shorter messages have been found to be effective in the past. Using shorter messages should help fix the potential issue related to the “strong” control message experienced in this study. As mentioned, it is possible that some of the expected self-schema matching effects were drowned out due to supplementing the control message with information to make it a similar length to the Big Five messages.

The current study indicates that matching to the ideal self-schema is not more effective than matching to the actual self-schema in relation to discouraging college student drinking. Future research might further examine if there are any situations where matching to the ideal self-schema would be more effective. For example, research could investigate whether those who drink to transform (see Treise, Wolburg, & Otnes, 1999) into someone more similar to their ideal schema would be more persuaded by a message tailored to that ideal schema. Additionally, studies can explore whether those who have matching actual and ideal schemas (i.e., they perceive themselves to be the person they would prefer to be) are more persuaded by a message tailored to their self-schema compared to those whose actual and ideal self-schema are different. Future studies could also investigate which type of matching would be more effective if the person’s actual and ideal self-schema are not the same.

Conclusions / Implications

Study 1 demonstrated the effectiveness of matching to self-schema is not outdone by matching to the Big-Five personality traits or matching to ideal self-schema when discouraging

irresponsible college drinking. It appears there may be a threshold of personalization that is sufficient when tailoring anti-binge drinking messages. This is an encouraging finding given the simplicity of self-schema matching and how participants like to select the schema cards. It is suggested that researchers continue pursuing utilization of the self-schema cards for anti-binge drinking interventions. However, there are other simple manipulations that might influence message persuasiveness, and one of these would be manipulating the context in which the persuasive message appears. Study 2 sought to determine how schema matching in combination with taking into account the congruence of the message within the context it is presented may influence message persuasiveness.

CHAPTER 3 - Experiment 2

Experiment 2 Method

Study 1 describes matching messages to an individual's personality as one way to increase the effectiveness of a persuasive message. Persuasive messages can also be matched to the context in which they are presented. Matching to the context (i.e., ensuring context congruence) refers to the extent to which the context is relevant to the topic or values of the message. For example, a PSA encouraging students to drink responsibly would be congruent with the topic of the context if it is presented within a party flier or webpage related to drinking alcohol. A PSA would be congruent with the values of website if they both seem to be sending the same overall message, such as acting responsibly (e.g., a PSA about drinking responsibly could be presented on a webpage with information about spiritual organizations). While the topics differ, the values are similar. A responsible drinking PSA would not be congruent with the context if it is presented in a newspaper section or webpage with information about some other topic unrelated to drinking (e.g., financial aid information, points of interest in town). The current study examined context matching with different combinations of *Topic Matching* and *Values Matching*.

Experiment 2 Overview

The aim of Study 2 was to determine which type of matching (person or context) is more important when presenting PSAs online and whether these types of matching have additive effects. It is very easy to ensure the congruency between a message and the website context (e.g., placing an ad for a car on a car-related website). The present study attempted to determine

whether making that small effort makes the message sufficiently persuasive, whether matching the message to the recipient's personality is more effective, or whether using a combination of matching simultaneously will significantly improve the effectiveness of the message. It was hypothesized that Person-Matching exerts more influence on message effectiveness because it makes the messages more personalized to the individual, so all levels of Person-Matching were expected to be more effective than Non-Matching conditions. It was also expected that adding Context *Values Matching* or Context *Topic Matching* to Person-Matching would improve the effectiveness of the message. In terms of the two Context Congruence manipulations, it was expected that Topic Matching and Values Matching would be more effective than Topic NonMatching or Values NonMatching.

The schema cards found effective in Study 1 lend themselves well to the testing of this particular hypothesis. The schema cards have been found to be effective in past research on binge drinking and they are straightforward, easy to use, and enjoyable for participants.

Independent Variables

This study has three independent variables. One independent variable is level of *Schema Matching*, with 2 levels: Schema Matched (the message is matched to the participant's self-schema), and Schema NonMatched (the participant receives a non-matched control message). The messages used in the current study have been pretested and published previously (Pilling & Brannon, 2007), therefore, there was no need to pretest them for this study. Message/context congruence was also manipulated two ways: *Topic Matching* (Matched or NonMatched) and *Values Matching* (Matched or NonMatched), with four combinations: Topic Matched/Values NonMatched context (a drinking message is presented on a drinking activities webpage), Topic Matched/Values Matched context (a drinking message is presented on a webpage with

information about Health Organizations –some promoting responsible drinking), Topic NonMatched/Values Matched context (a drinking message is presented on a web page with information about spiritual organizations), and a Topic NonMatched/ Values NonMatched control context (a drinking message is presented on a webpage about social activities/points of interest that do not involve drinking alcohol). The topic of the PSA is “drinking alcohol” and the value is “behaving responsibly”, thus the selection of these conditions.

Dependent Variables

The dependent variables of interest were measures of attitudes toward the message, beliefs about binge drinking, and intentions for drinking. Most of these dependent variables are the same as those used in Study 1. As a reminder, the dependent measures assessing attitudes toward the message included items related to how interesting and informative the message is, which were all measured on 7-point Likert scales (1 = Disagree Strongly/ 7 = Agree Strongly): “The message on the website about binge drinking was interesting;” “I learned something from the message;” and “I received new information from the message.” Also included were items related to how attractive the message is: “I (1 = dislike / 7 = like) the message;” “I react (1 = unfavorably/ 7 = favorably) to the message;” and “I feel (1 = negatively/ 7 = positively) to the message.” A new set of items was also included to assess the extent to which the participant believed the message was appropriate in the context of the website: “How appropriate is the message in the context of the website you viewed?” (1 = Very Inappropriate/ 7 = Very Appropriate); “How relevant was the message to the content of the website you viewed?” (1 = Very Irrelevant/ 7 = Very Relevant). Beliefs about binge drinking were assessed with the following items: “I (1 = like/ 7 = dislike) binge drinking;” “I feel (1 = positive/ 7 = negative) toward binge drinking;” and “Binge drinking is (1 = nice/ 7 = awful).” A new item was added to

assess how important of a decision the participant believed binge drinking to be: “Decisions about your drinking behavior require (1 = Little/ 7 = A lot of) thought.” It was thought that presenting the PSA on web pages of varying levels of congruence may influence participants’ thoughtfulness. Specifically, the context/message incongruence could potentially stimulate thinking (Maheswaran & Chaiken, 1991).

The drinking intention dependent measure was again assessed by asking participants how many alcoholic drinks they plan on having on occasions when they go out drinking, as well as how many alcoholic drinks they plan on having on occasions when they stay in drinking, in the next week. Intentions for drinking while out and drinking while staying in were measured separately because it was thought that the different drinking situations could influence drinking behavior. Specifically, drinking while out may be influenced more by social pressures, while drinking in may be influenced more by personal attitudes about drinking. Thus, different types of appeals may be most effective for intentions in different drinking contexts. Number of drinks was investigated because the definition of binge drinking is stated in terms of number of drinks. Once the number of drinks is reached to be considered binging, there is an increased likelihood that the individual will experience negative consequences.

As in Experiment 1, drinking intentions and attitudes were assessed rather than actual drinking behavior. Assessing students’ acceptance of (attitudes toward) the messages in a preliminary study is important because it will allow the researcher to determine whether conducting a larger, more expensive behavior change study is worthwhile (Erlich, Haque, Swisher-McClure, & Helmkamp, 2006; Rudy, Rosenfeld, Galassi, Parker, & Schanberg, 2001). This method of assessing perceptions of drinking interventions has been used in the past (Koski-Jannes & Cunningham, 2001; Kypri, Saunders, & Gallagher, 2003). Further, attitudes are

thought to influence behavioral intentions, and intentions are considered the best predictor of behavior (Ajzen & Fishbein, 1980). In fact, students' drinking intentions have been found to be highly positively related to their later drinking behavior (Fishbein, Ajzen, & McArdle, 1980; Glindemann, Geller, & Ludwig, 1996; Shim & Maggs, 2005).

Procedure

One hundred eighty-four general psychology students served as participants and received class credit for their participation. Students signed up to participate on sheets identical to those of Study 1 (See Appendix C). As a reminder, the study was labeled "Life in Manhattan Website Evaluation" and described the study as involving the students viewing a website about activities in town and completing surveys about their opinions of the website and about their activities (especially eating and drinking behaviors, including habits relating to drinking alcohol).

Similar to Study 1, the data was collected in several group sessions in which up to ten students participated simultaneously. Upon arrival at the lab, participants were randomly assigned to a computer work station which determined their assignment to the Person Matching and two types of Context Congruence conditions (Topic and Values Matching). Each computer terminal again contained computer-based surveys and a website simulation containing descriptions of activities available in town. The website simulation had links to web pages giving information about bars, health organizations, spiritual organizations, and points of interest in town. After signing the two consent forms (one for them to keep and one for the researcher's files; Appendix D), participants began viewing the website.

Pre-intervention surveys. The first survey page was the schema selection survey. It instructed participants to familiarize themselves with descriptions of the four schema types, and it asked them to indicate which schema type they most identify with (which one is most like their

own personality). The cover story was the same as in Study 1: the experimenters were interested in developing a new website about activities in town and they want student feedback on what they had developed. In addition to indicating their self-schema, they also were asked to complete demographic information such as gender and fraternity/sorority membership. The participants' identification of their self-schema allowed the computer program to tailor the message to their self-schema if randomly assigned to a self-schema matching condition.

The next survey page was the same Activities and Interests Survey from Study 1 (Appendix F). This survey included inquiries about the behavior of interest (e.g., how many drinks they have on occasions when going out drinking and how many drinks when staying in drinking) amongst distracter activity items. This survey allowed the researcher to obtain the participants' baseline drinking behaviors.

PSAs and Contexts. The next page was the homepage of the website simulation. The homepage was similar to that of Study 1. As a reminder, the homepage had a split-screen. The larger right-hand panel contained a welcome to the website and instructions that they should look around the website in a consistent fashion given that they will be asked about it at a later time. The smaller left-side panel contained the links to the web pages on the website. These four links varied in the two types of Context Congruence; they were web pages about Bars (Topic Matching/Values NonMatching), Health Organizations (Topic Matching/Values Matching), Spiritual Organizations (Topic NonMatching/Values Matching), and Points of Interest in town (Topic NonMatching/Values NonMatching). See Appendix N for further descriptions of the four contexts. The order of the four links depended on the two types of Context Congruence to which the participant was randomly assigned. For example, if the participant was randomly assigned to the Bars condition (Topic Matching/Values NonMatching), the link for Bars was presented as the

last link. If the participant was randomly assigned to the Points of Interest condition (Topic NonMatching/Values NonMatching), the Points of Interest web page was presented as the last of the four links on the left-hand panel. It worked similarly for the other two Context Congruence conditions; whichever Context Congruence condition the participant was randomly assigned to, that webpage link was listed last on the left-hand panel. When the participant clicked on the final link (the one that contains the responsible drinking message), that webpage was split-screen. The larger right-hand panel contained the content of the webpage (which varied depending on the condition the participant was assigned to), and the smaller left-hand panel contained the responsible drinking message. Depending on the participants' level of Self-Schema Matching, the message was either matched to their self-schema or not matched to their self-schema. For example, if the participant selected the "Adventurous" self-schema they received the following message: "Alcohol is actually a depressant. When too much is consumed, alcohol dulls the senses and slows a person down, thereby making it impossible for them to be the life of the party. Binge drinking actually limits the amount of fun and excitement you can experience in a night. Live the Exciting Life, Don't Binge Drink!" On the other hand, if the participant selected the "Curious" self-schema, they received the following message: "Consuming excess alcohol kills brain cells (especially in those younger than 25), thus significantly reducing one's cognitive capacity. It makes people less mentally capable and curious. It's important to be rational and in control of your mind. Don't let too many drinks change your ability to think. Drink Smart, and Don't Binge Drink."

It should be noted that messages used in Study 2 were shorter than those used in Study 1. It was necessary for the Study 1 messages to be longer because all messages had to be consistent with the length of the BFI messages (the Study 1 BFI messages were longer because they had

five short paragraphs to address five separate characteristics of the individual). When the participant finished viewing the website simulation, they clicked to the next page to complete more computer-based surveys.

Post-intervention surveys. The participants in Study 2 completed the same surveys after viewing the website as did the participants in Study 1. Participants first completed an evaluation of the website (Appendix G). The survey asked their opinions on each web page link as well as the website as a whole. This helped to reinforce the cover story about the researchers wanting feedback about the new website.

The next survey was the survey asking them to indicate their intended behaviors over the next week (Appendix H). They were asked to indicate their intended drinking behavior for the next week (i.e., how many alcoholic drinks they think they will have on occasions when they go out drinking and when they stay in drinking, in the next week). They also were asked to indicate intended behaviors related to other activities they had viewed on the website. They were told that the researchers wanted to know if viewing the website made the students want to try new activities they may not have been aware of before.

Next, participants completed the survey relating to their attitudes about the drinking message they read (Appendix I). They were told that another interest of the researchers was to use the website to display health-related PSAs, and the researchers wanted to know what the student thought of the one they had viewed. As a reminder, the dependent measures assessing attitudes toward the message included items related to how interesting and informative the message is, which were all measured on 7-point Likert scales (1 = Disagree Strongly, 7 = Agree Strongly): “The message on the website about binge drinking was interesting;” “I learned something from the message;” and “I received new information from the message.” Also

included were items related to how attractive the message is, also measured on 7-point scales: “I (1 = dislike/ 7 = like) the message;” “I react (1 = unfavorably/ 7 = favorably) to the message;” and “I feel (1 = negatively/ 7 = positively) to the message.” A new set of items assessed the extent to which the participant believed the message was appropriate in the context of the website: “How appropriate is the message in the context of the website you viewed?” (1 = Very Inappropriate/ 7 = Very Appropriate); and “How relevant was the message to the content of the website you viewed?” (1 = Very Irrelevant/ 7 = Very Relevant).

Next, beliefs about binge drinking were assessed with the following items (Appendix J): “I (1 = like/ 7 = dislike) binge drinking;” “I feel (1 = positive/ 7 = negative) toward binge drinking;” and “Binge drinking is (1 = nice/ 7 = awful).” Another new item assessed how important a decision the participant believed binge drinking to be: “Decisions about your drinking behavior require (1 = Little/ 7 = A lot of) thought.”

Participants then completed the Social Desirability Scale (Appendix K), questions assessing the extent to which they were suspicious of the purpose of the study, and some manipulation checks (Appendix L). After the participants completed all the surveys, they were debriefed the same way as in Study 1 (Appendix M). They were told that the researchers were investigating how matching health messages to an individual’s personality will influence their interpretation of the message. These participants were also given the experimenter’s contact information and told that they should talk to the experimenter if they have concerns about their own or a friend’s alcohol use.

Experiment 2 Results

Manipulation Check

Two questions served as manipulation checks to ensure the Topic Matching and Values Matching manipulations were perceived appropriately. In other words, the questions served to check whether the Topic Matching or Values Matching contexts were perceived to match the topic or values of the message more than the Topic NonMatching and Values NonMatching contexts. The manipulations were successful. The Topic Matching web pages ($M = 5.08$, $SD = 1.31$) were perceived to match the topic of the message better than the Topic NonMatching web pages ($M = 3.12$, $SD = 1.70$); $F(1, 182) = 76.21$, $p < .001$. Also, the Values Matching web pages ($M = 4.79$, $SD = 1.45$) were perceived to match the values of the message better than the Values NonMatching web pages ($M = 3.77$, $SD = 1.82$); $F(1, 182) = 17.72$, $p < .001$.

Participant Characteristics

Of the 184 undergraduate participants, 95 (51.6%) were female, and 89 (48.4%) were male. Also, 164 (89.1%) were underage, and 20 (10.9%) were of legal drinking age. Participants' average age was 19.4 years ($SD = 1.8$). While 90 students (48.9%) were not binge drinkers, 94 students (51.1%) were binge drinkers. Additionally, the random assignment to conditions was effective. The mean age of participants, distribution of genders, distribution of binge/nonbinge students, and distribution of underage/of age students were statistically similar for those in the schema-matched and control groups, the topic matched and topic nonmatched groups, and the values matched and values nonmatched groups.

Behavioral Intentions

Two 2 (Schema Matching: Matched/NonMatched Control) X 2 (Topic Matching: Matched/NonMatched) X 2 (Values Matching: Matched/NonMatched) X 2 (Gender:

males/females) between-subjects Analyses of Covariance (ANCOVA) were performed on the behavioral intention measures. One ANCOVA was performed on the dependent measure of how many alcoholic beverages the participant intended to drink on occasions when they go out drinking during the next week⁷, and one ANCOVA was performed on how many alcoholic beverages the participant intended to drink on occasions when they stay in drinking during the next week^{8,9}. The two covariates in the analyses included a pre-treatment indication of the number of alcoholic beverages typically consumed by the participant on the drinking occasion¹⁰ (either when going out drinking or staying in drinking) and the participant's social desirability score¹¹.

An ANCOVA was performed on the dependent measure of how many alcoholic beverages the participant intended to drink on occasions when going out drinking during the next week. The two covariates in the analysis included a pre-treatment indication of the number of alcoholic beverages typically consumed by the participant when going out drinking and the participant's social desirability score. The ANCOVA was significant for Topic Matching [$F(1, 160) = 4.85, p < .05$; partial $\eta^2 = .029$]. Refer to Table 14 for means and standard errors for this analysis. Participants receiving their message on a Topic Matching web page (i.e., Bars or Health

⁷ Although a majority of participants were underage, they still found the phrase “going out drinking” to be meaningful, as more underage participants indicated that they go out drinking than stay in drinking. While the phrase was clearly meaningful to participants, the researchers are not exactly sure how it was interpreted (e.g., using a fake id to gain access to a bar, attending a fraternity or house party, etc.).

⁸ Drinking intentions were measured as number of drinks consumed on a drinking occasion because that is how binge drinking is defined. Once a person reaches the number of drinks considered binge drinking, their likelihood of experiencing negative consequences increases.

⁹ As in Study 1, intentions for drinking while out and drinking while in were investigated separately because it is thought that drinking in these different situations may be influenced by different factors. For example, drinking while out may be influenced more by social pressures, and drinking while in may be influenced more by personal preferences related to drinking.

¹⁰ Typical drinking behavior was covaried to control for differences in initial levels of drinking.

¹¹ Social desirability was controlled for because some students may be more inclined to report reduced drinking intentions or more favorable attitudes toward the messages because they want to appear helpful or more socially responsible.

Organizations) ($M = 3.59, SE = 0.12$) intended to drink fewer drinks when going out drinking than those who viewed a message on a Topic NonMatching webpage (i.e., Spiritual Organizations, Points of Interest) ($M = 3.97, SE = 0.12$). There was also a significant interaction between Schema Matching and Gender [$F(1, 160) = 4.27, p < .05$; partial $\eta^2 = .026$]. While females who received a schema-matched message ($M = 3.87, SE = 0.17$) did not differ much in their intended drinking behavior for going out drinking from females who received a non-matched control message ($M = 3.79, SE = 0.17$), males who received a schema-matched message ($M = 3.41, SE = 0.18$) intended to drink fewer drinks when going out compared to males who received a non-match control message ($M = 4.04, SE = 0.18$). The ANCOVA did not show significant main effects for Schema Matching [$F(1, 160) = 2.47, ns$, partial $\eta^2 = .015$], Values Matching [$F(1, 160) = 0.22, ns$, partial $\eta^2 = .001$], or Gender [$F(1, 160) = 0.34, ns$, partial $\eta^2 = .002$]. Participants receiving a schema matched message ($M = 3.64, SE = 0.12$) intended to drink a similar amount when going out drinking to those who received a non-matched control message ($M = 3.91, SE = 0.12$). Those receiving the message in a Values Matching web page ($M = 3.82, SE = 0.12$) intended to drink a similar amount when going out drinking to those who received it on a Values NonMatching web page ($M = 3.74, SE = 0.13$). Also, after controlling for typical drinking behavior (which is associated with gender such that males tend to drink more than females), females ($M = 3.83, SE = 0.12$) intended to drink a similar amount while going out drinking as males did ($M = 3.72, SE = 0.13$).

A second ANCOVA was performed on the dependent measure of how many alcoholic beverages the participant intended to drink on occasions when staying in drinking during the next week. The two covariates in the analysis included a pre-treatment indication of the number of alcoholic beverages typically consumed by the participant when staying in drinking and the

participant's social desirability score. This ANCOVA had a significant main effect for Schema Matching [$F(1, 160) = 4.54, p < .05$; partial $\eta^2 = .028$]. Refer to Table 15 for means and standard errors for this analysis. Participants receiving a self-schema matched message ($M = 1.75, SE = 0.16$) reported intentions to drink fewer alcoholic beverages on occasions when they stay in drinking in the next week, compared to participants who viewed a non-matched control message ($M = 2.22, SE = 0.16$). There were no main effects for Topic Matching [$F(1, 160) = 0.23, ns$, partial $\eta^2 = .001$], Values Matching [$F(1, 160) = 0.14, ns$, partial $\eta^2 = .001$], or Gender [$F(1, 160) = 0.92, ns$; partial $\eta^2 = .006$]. Participants who viewed the message on a Topic Matching web page ($M = 1.93, SE = 0.16$) intended to drink a similar amount to the participants who viewed the message on a Topic NonMatching web page ($M = 2.04, SE = 0.16$) when staying in drinking. Those who received a message on a Values Matching web page ($M = 2.03, SE = 0.15$) intended to drink a similar amount when staying in drinking to those who received the message on a Values NonMatching web page ($M = 1.94, SE = 0.16$). After controlling for typical drinking behavior (which is associated with gender such that males tend to drink more than females), females ($M = 1.87, SE = 0.16$) and males ($M = 2.10, SE = 0.16$) intended to drink a similar number of alcoholic beverages on occasions when they stayed in drinking in the next week. See Tables 16 and 17 for the complete ANCOVA tables corresponding to these analyses. Given that drinking alcohol can be such an integral part of a college student's life, it is surprising that a short, one-time presentation of a message designed to discourage binge drinking can influence students' intended drinking behavior. Interestingly, drinking intentions for going out and staying in were influenced by different types of matching (topic matching reduced intentions for drinking while going out, and schema matching reduced intentions for drinking while staying in).

Beliefs about Binge Drinking and Attitudes about Message Persuasiveness

A 2 (Schema Matching: Matched/NonMatched Control) X 2 (Topic Matching: Matched/NonMatched) X 2 (Values Matching: Matched/NonMatched) X 2 (Gender: males/females) between-subjects Multivariate Analysis of Covariance (MANCOVA) was performed on the dependent measures assessing participants' attitudes toward the message and beliefs toward binge drinking. These dependent measures included a composite of three items assessing participants' beliefs about how good or bad binge drinking is ($\alpha = 0.93$) ["I (1 = like/ 7 = dislike) binge drinking;" "I feel (1 = positive/ 7 = negative) toward binge drinking;" and "Binge drinking is (1 = nice/ 7 = awful)"], a composite of three items measuring how interesting and informative the message is ($\alpha = 0.79$) ["The message on the website about binge drinking was interesting;" "I learned something from the message;" and "I received new information from the message" all measured on 7-point Likert scales (1 = Disagree Strongly/ 7 = Agree Strongly)], a composite of three items assessing how attractive or likeable the message is ($\alpha = 0.74$) ["I (1 = dislike / 7 = like) the message;" "I react (1 = unfavorably/ 7 = favorably) to the message;" and "I feel (1 = negatively/ 7 = positively) to the message."], an item related to the importance of the decision to binge drink ["Decisions about your drinking behavior require (1 = Little/ 7 = A lot of) thought."], and an index of two items related to how appropriate or relevant the message was in the context it was presented ($\alpha = 0.83$) ["How appropriate is the message in the context of the website you viewed?" (1 = Very Inappropriate/ 7 = Very Appropriate); "How relevant was the message to the content of the website you viewed?" (1 = Very Irrelevant/ 7 = Very Relevant)]. The three covariates included in the analysis were a pre-treatment indication of the number of alcoholic beverages typically consumed by the participant when going out drinking, a pre-treatment indication of the number of alcoholic beverages typically consumed by the participant when staying in drinking, and the participant's social desirability score. The MANCOVA

indicated a significant main effect for Topic Matching [Wilks' $\Lambda = .86$; $F(5, 161) = 5.30$, $p < .001$; partial $\eta^2 = .141$], and the Topic Matching X Values Matching interaction [Wilks' $\Lambda = .92$; $F(5, 161) = 2.80$, $p < .05$, partial $\eta^2 = .080$], and it approached significance for Schema Matching main effect [Wilks' $\Lambda = .94$; $F(5, 161) = 2.04$, $p = .076$; partial $\eta^2 = .060$]. See Table 18 for the complete MANCOVA table corresponding to the analysis.

To further explore the significant effects, a series of 2 (Schema Matching: Matched/NonMatched Control) X 2 (Topic Matching: Matched/NonMatched) X 2 (Values Matching: Matched/NonMatched) X 2 (Gender: males/females) between-subjects ANCOVAs were performed on the individual dependent measures related to beliefs about binge drinking and attitudes toward the message. The covariates in these ANCOVAs were the same as used in the MANCOVA (i.e., a pre-treatment indication of the number of alcoholic beverages typically consumed by the participant when going out drinking, a pre-treatment indication of the number of alcoholic beverages typically consumed by the participant when staying in drinking, and the participant's social desirability score).

Beliefs about Binge Drinking

Belief about Binge Drinking Being a Bad or Good Behavior. The ANCOVA related to participants' beliefs about binge drinking being a good or bad behavior was not significant for Schema Matching [$F(1, 165) = 0.02$, *ns*; partial $\eta^2 = .000$], Topic Matching [$F(1, 165) = 0.04$, *ns*; partial $\eta^2 = .000$], Values Matching [$F(1, 165) = 0.08$, *ns*, partial $\eta^2 = .000$], or Gender [$F(1, 165) = 0.43$, *ns*; partial $\eta^2 = .003$]. The exact wording of these items were "I (1 = like/ 7 = dislike) binge drinking;" "I feel (1 = positive/ 7 = negative) toward binge drinking;" and "Binge drinking is (1 = nice/ 7 = awful)." Refer to Table 19 for means and standard errors for this analysis. Participants who received the self-schema matched message ($M = 5.53$, $SE = 0.12$) and

non-matched control message ($M = 5.55$, $SE = 0.12$) believed binge drinking to be a similarly bad behavior in which to engage. Those viewing the message on a Topic Matching web page ($M = 5.56$, $SE = 0.12$) thought the behavior of binge drinking was similarly bad to engage in as those who viewed the message on a Topic NonMatching web page ($M = 5.52$, $SE = 0.12$). Those receiving the message on a Values Matching web page ($M = 5.57$, $SE = 0.12$) thought it was a similarly bad behavior to engage in as those receiving the message on a Values Nonmatching web page ($M = 5.52$, $SE = 0.12$). Females ($M = 5.60$, $SE = 0.12$) and males ($M = 5.48$, $SE = 0.13$) thought that binge drinking is similarly bad as a behavior in which to engage.

Belief about the Decision to Binge Drink Being an Important Decision. The ANCOVA related to participants' beliefs about the decision to binge drink being an important decision that requires a lot of thought indicated a significant main effect for Schema Matching [$F(1, 165) = 4.45$, $p < .05$; partial $\eta^2 = .026$] and a Topic Matching X Values Matching interaction [$F(1, 165) = 5.82$, $p < .05$; partial $\eta^2 = .034$]. The wording of this item was "Decisions about your drinking behavior require (1 = Little/ 7 = A lot of) thought." Refer to Table 20 for means and standard errors for this analysis. Participants who received the self-schema matched message ($M = 4.78$, $SE = 0.20$) reported that the decision to binge drink was a more important decision that requires a lot of thought, compared to the participants who viewed the non-matched control message ($M = 4.17$, $SE = 0.20$). When there was Values NonMatching, it did not seem to matter whether there was Topic Matching ($M = 4.46$, $SE = 0.29$) or Topic NonMatching ($M = 4.27$, $SE = 0.28$). However, when there was Values Matching, participants who viewed the message on a Topic NonMatching web page ($M = 5.17$, $SE = 0.28$) thought the decision to binge drink required more thought than the participants who viewed the message on a Topic Matching web page ($M = 4.00$, $SE = 0.28$). The main effects for Topic Matching [$F(1, 165) = 2.97$, ns , partial $\eta^2 = .018$],

Values Matching [$F(1, 165) = 0.61, ns, \text{partial } \eta^2 = .004$]; and Gender [$F(1, 165) = 0.43, ns, \text{partial } \eta^2 = .003$] were not significant. Those viewing the message on a Topic Matching web page ($M = 4.23, SE = 0.20$) and Topic NonMatching web page ($M = 4.72, SE = 0.20$) thought the decision to binge drink required a similar amount of thought. Those viewing the message on a Values Matching web page ($M = 4.58, SE = 0.20$) and Values NonMatching web page ($M = 4.36, SE = 0.20$) thought the decision to binge drink required a similar amount of thought. Females ($M = 4.57, SE = 0.20$) and males ($M = 4.38, SE = 0.21$) believed the decision to binge drink to be similarly important. See Tables 21 and 22 for the complete ANCOVA tables corresponding to the analyses.

Attitudes about Message Persuasiveness

How Appropriate or Relevant the Message Is in the Web Page Context. The ANCOVA related to participants' perceptions of how appropriate or relevant the message was in the context of the web page indicated a significant main effect for Topic Matching [$F(1, 165) = 18.59, p < .001; \text{partial } \eta^2 = .101$]. The exact wording of the items was "How appropriate is the message in the context of the website you viewed?" (1 = Very Inappropriate/ 7 = Very Appropriate) and "How relevant was the message to the content of the website you viewed?" (1 = Very Irrelevant/ 7 = Very Relevant). Refer to Table 23 for means and standard errors for this analysis.

Participants who viewed the message on a Topic Matching web page ($M = 4.73, SE = 0.17$) believed the message to be more appropriate in the context it was presented compared to those receiving the message on a Topic NonMatching web page ($M = 3.71, SE = 0.17$). There was also a significant Topic Matching by Values Matching interaction [$F(1, 165) = 5.90, p < .05, \text{partial } \eta^2 = .034$]. If the message was presented on a Topic Matching web page, participants thought it was more appropriate if the message was Values NonMatching ($M = 4.98, SE = 0.25$)

instead of Values Matching ($M = 4.48, SE = 0.23$). When the message was presented on a Topic NonMatching web page, participants thought it was more appropriate if it was Values Matching ($M = 4.03, SE = 0.23$) instead of Values NonMatching ($M = 3.39, SE = 0.23$). It appears the participants thought it was more appropriate if the message was congruent with the web page context in only one way (either topic congruent or values congruent, but not both). However, participants believed it was more appropriate for it to be congruent in some way rather than no way. The most appropriate message was on a Topic Matching and Values NonMatching web page. There were no main effects for Schema Matching [$F(1, 165) = 0.01, ns, \text{partial } \eta^2 = .000$], Values Matching [$F(1, 165) = 0.09, ns, \text{partial } \eta^2 = .001$], or Gender [$F(1, 165) = 0.00, ns, \text{partial } \eta^2 = .000$]. Participants receiving a self-schema matched message ($M = 4.21, SE = 0.17$) or a non-matched control message ($M = 4.24, SD = 0.17$) perceived the message to be similarly appropriate to the context in which it was presented. Those viewing the message in a Values Matching context ($M = 4.26, SE = 0.17$) and a Values NonMatching context ($M = 4.19, SE = 0.17$) believed it was similarly appropriate. Females ($M = 4.22, SE = 0.17$) and males ($M = 4.22, SE = 0.18$) also perceived the message to be similarly appropriate to the context in which it was presented.

How Interesting and Informative the Message Is. The ANCOVA related to participants' perceptions of how interesting and informative the message is was not significant for any of the main effects, including Schema Matching [$F(1, 165) = 1.20, ns, \text{partial } \eta^2 = .007$], Topic Matching [$F(1, 165) = 0.04, ns, \text{partial } \eta^2 = .000$], Values Matching [$F(1, 165) = 0.004, ns, \text{partial } \eta^2 = .000$], or Gender [$F(1, 165) = 0.40, ns, \text{partial } \eta^2 = .002$]. The wording of these items was "The message on the website about binge drinking was interesting;" "I learned something from the message;" and "I received new information from the message." All items

were measured on 7-point Likert scales (1 = Disagree Strongly/7 = Agree Strongly). Refer to Table 24 for means and standard errors for this analysis. Participants receiving the self-schema matched message ($M = 3.54$, $SE = 0.16$) and the non-matched control message ($M = 3.30$, $SE = 0.15$) thought the message was similarly interesting and informative. Those viewing the message on a Topic Matching web page ($M = 3.44$, $SE = 0.15$) and a Topic NonMatching web page ($M = 3.40$, $SE = 0.15$) thought the message was similarly interesting and informative. Those viewing the message on a Values Matching webpage ($M = 3.43$, $SE = 0.15$) and a Values NonMatching webpage ($M = 3.41$, $SE = 0.15$) thought it was similarly interesting and informative. Females ($M = 3.49$, $SE = 0.16$) and males ($M = 3.35$, $SE = 0.16$) perceived the message as equally interesting and informative.

How Attractive the Message Is. The ANCOVA performed on the index related to how attractive the message is had a significant main effect for Gender [$F(1, 165) = 5.74$, $p < .05$; partial $\eta^2 = .034$]. Wording of these items is “I (1 = dislike / 7 = like) the message;” “I react (1 = unfavorably/ 7 = favorably) to the message;” and “I feel (1 = negatively/ 7 = positively) to the message.” Refer to Table 25 for means and standard errors for this analysis. Females ($M = 5.03$, $SE = 0.12$) thought the message was more attractive than males ($M = 4.60$, $SE = 0.12$). There was also a significant Topic Matching X Values Matching interaction [$F(1, 165) = 5.08$, $p < .05$, partial $\eta^2 = .030$]. Participants reported the message as more attractive if it was Topic Matching only ($M = 4.97$, $SE = 0.17$) or Values Matching only ($M = 5.04$, $SE = 0.16$), rather than high in both types of matching ($M = 4.57$, $SE = 0.16$), or low in both types ($M = 4.69$, $SE = 0.17$). There were no significant main effects for Schema Matching [$F(1, 165) = 3.16$, ns , partial $\eta^2 = .019$], Topic Matching [$F(1, 165) = 0.30$, ns , partial $\eta^2 = .002$], or Values Matching [$F(1, 165) = 0.02$, ns , partial $\eta^2 = .000$]. Those receiving the self-schema matched message ($M = 4.67$, $SE = 0.12$)

or non-matched control message ($M = 4.97, SE = 0.12$) thought the message was similarly attractive. Those receiving the message on a Topic Matching web page ($M = 4.77, SE = 0.12$) or a Topic NonMatching web page ($M = 4.86, SE = 0.12$) thought the message was similarly attractive. Those viewing the message on a Values Matching web page ($M = 4.81, SE = 0.12$) and a Values NonMatching web page ($M = 4.83, SE = 0.12$) thought the message was similarly attractive. See Tables 26 through 28 for the complete ANCOVA tables corresponding to the analyses.

Suspicion Questions

When asked to indicate if they were suspicious of anything in the experiment, about 75% of participants indicated they were not suspicious. Of the 45 participants who indicated they were suspicious of something, 28 indicated there were more questions about binge drinking than they had anticipated, but none of them described the real purpose of the study when asked to report what they were suspicious of. When prompted to report the extent to which they thought the purpose of the experiment dealt with the drinking message, participants on average indicated that they were not very suspicious ($M = 4.73, SD = 1.70$). This is a similar level to that reported by Study 1 participants. Again, it is surprising that this number is not higher given that the experimenters stated within survey instructions that they were interested in using the website to present students with PSAs and that is the reason they were being asked about their opinion regarding the PSA. Perhaps the students do not report being “suspicious” of the purpose being related to the PSA because the researchers stated that this was one purpose of the study, so there was not much to be suspicious of.

When prompted to indicate the extent to which they thought the purpose of the experiment dealt with the message being located on a specific webpage for a specific reason, on

average participants reported that they also were not particularly suspicious about that ($M = 4.18$, $SD = 1.70$). As in Study 1, participants' responses to both of these questions were around the midpoint of the scale (a 4), so it did not appear that they were suspicious of the purpose of the study. When asked next to report what they thought the purpose was, nine participants suggested that perhaps we thought the messages would be more effective if presented on one type of web page compared to others. Because participants did not describe the purpose of the study until prompted with the purpose in the previous question, there was no concern that participants saw through the cover story. Additionally, the same pattern of results emerged when these nine participants were removed from the analyses.

Experiment 2 Discussion

In Study 2, three types of message matching were investigated. As in Study 1, Schema Matching was utilized, with some participants receiving a message matched to their reported self-schema, and other receiving a non-matched control message. There were also two types of Context Matching manipulations, with 1) matching the context to the topic of the message (drinking), and 2) matching the context to the values of the message (acting responsibly). There was an interest in determining which type of matching may be most influential when attempting to persuade undergraduates to drink alcohol responsibly as well as how these types of matching might interact with each other. It would be useful to determine whether simply matching the context to the message helps the message be sufficiently persuasive, or if the extra effort is needed to actually match a message to the individual person.

Schema Matching

Schema matching influenced participants' intentions for drinking while staying in during the next week, and it influenced their beliefs that the decision to binge drink is an important one

that requires a lot of thought. Those receiving a self-schema matched message intended to drink fewer alcoholic beverages while staying in during the next week, and they also reported the decision to binge drink being a more important decision requiring a lot of thought, compared to those receiving a non-matched control message. Schema matching did not influence participants' intentions for drinking when going out in the next week, their beliefs that binge drinking is a bad behavior, or their attitudes that the message was interesting and informative, attractive, or appropriate to the context in which it was presented.

Topic Matching

Topic Matching influenced participants' intentions to drink when going out in the next week and their attitudes related to how appropriate the message was in the context in which it was presented. Those receiving the message on a Topic Matching web page intended to drink fewer alcoholic beverages on occasions when going out drinking in the next week, and they thought the message was more appropriate in the web page context, compared to those receiving the message on a Topic NonMatching web page. Topic Matching did not influence participants' intentions for drinking when staying in during the next week, their beliefs that binge drinking is a bad behavior, their beliefs that the decision to binge drink is an important one that requires a lot of thought, or their attitudes that the message was interesting and informative, or attractive.

Topic Matching by Values Matching Interaction

Values Matching did not influence any of the dependent measures through main effects. However, Topic Matching and Values Matching interacted for the dependent measures of beliefs that binge drinking is an important decision that requires a lot of thought, their attitudes about how appropriate the message was in the context in which it was presented, and how attractive the message was. When there was Values Matching, participants who viewed the message on a

Topic NonMatching web page (Spiritual Organizations) thought the decision to binge drink required more thought than the participants who viewed the message on a Topic Matching web page (Health Organizations), but when there was Values NonMatching, those viewing the message on a Topic Matching or Topic NonMatching reported the decision to binge drink being similarly important. If the message was presented on a Topic Matching web page, participants thought it was more appropriate if the message was Values NonMatching (Bars) instead of Values Matching (Health Organizations). When the message was presented on a Topic NonMatching web page, participants thought it was more appropriate if it was Values Matching (Spiritual Organizations) instead of Values NonMatching (Points of Interest). Similarly, participants reported the message as more attractive if it was Topic Matching only (Bars) or Values Matching only (Spiritual Organizations), rather than high in both types of matching (Health Organizations), or low in both types (Points of Interest).

Drinking Intentions

Surprisingly, there were significant main effects of matching for drinking intentions. Interestingly, the type of matching found to be significantly influencing drinking intentions was different for intentions for occasions when going out drinking and intentions for occasions when staying in drinking. For intentions for occasions when staying in drinking, participants were influenced by Schema Matching. Those receiving a schema matching message intended to drink fewer alcoholic beverages when staying in than did those viewing a non-matched control message. However, for intentions for occasions when going out drinking, participants were influenced by Topic Matching. Those receiving a Topic Matching message intended to drink fewer alcoholic beverages on occasions when going out drinking in the next week, compared to those viewing a Topic NonMatching message. In both cases, those who received a matched

message intended to drink fewer alcoholic beverages on drinking occasions in the next week.

These differences are possibly explained by the fact that the intentions are for different *drinking contexts*. When staying in drinking, it is more likely that there will be fewer outside social pressures to drink, so appealing to the individual's core values is effective at persuading them to drink less. On the other hand, when going out drinking, matching the message to the topic is more persuasive at convincing them to drink less. When going out drinking, the drinking context is a bar, so presenting the message on a web page with information about bars or drinking-related information is more congruent with that "going out" drinking context, and that may be why matching to the topic is more effective. When going out drinking, it is more likely that people will be among a group of friends and there will be more social pressures to drink a certain way or a certain amount. In this drinking context, appealing to the individual's core values may not be as effective because there are more people/influences involved in the drinking situation.

The schema matching intervention had a greater influence on males than females in terms of intentions for drinking when staying in. While females did not intend to drink fewer drinks when receiving the schema matched message compared to the control, males did intend to drink fewer drinks on occasions when staying in drinking when they received the schema matched message. This effect may be occurring because males' reported baseline drinking behavior was higher than females. At baseline (without the covariates), females on average reported drinking few drinks on occasions when staying in drinking ($M = 1.18$, $SD = 1.85$), thus we may have experienced a floor effect. There was not much room for females, on average, to decrease their reported drinking. Females seem to do their heaviest drinking while they are out.

That the students reported intentions to drink fewer drinks as a function of the matching interventions is very encouraging. While the ultimate goal of research such as this is to decrease

actual drinking behavior, it is often difficult to get effects for intentions for behavior. Often, research involving encouraging undergraduates to drink responsibly must rely on ratings of the likeability or attractiveness of the messages, or how interesting the message is, instead of actual decreases in intentions to drink, as indications of the persuasiveness of the messages/interventions.

Ratings of Message Persuasiveness

Of course, we did collect ratings of message persuasiveness. Results of the current study suggest that even though participants are reporting reduced intentions for drinking both when going out and staying in, they are not reporting the message influenced them (e.g., they do not think the message influenced how bad of a behavior they think binge drinking is). However, in research like this, the purpose of the message is to influence behavior. If the message can influence behavior or intentions, even without people realizing they are being influenced, that would achieve one of the goals of the PSAs. Future research could further explore participants' perceptions in order to determine what exactly about the messages is influencing them and why they do not realize how much they are being influenced. It is possible that students do not like messages that are obviously trying to influence them, or perhaps they just do not realize that the message is influencing them. While this information would be interesting to explore, the fact that the PSAs are influencing intentions, the most proximal predictor of behavior, is very promising. The PSAs are reducing intentions to drink on occasions when both staying in and going out drinking.

Importance of the Decision to Binge Drink. The matching manipulations did influence participants' beliefs regarding how important the decision is to binge drink. Participants who received the self-schema matched message reported that the decision to binge drink was a more

important decision that requires a lot of thought, compared to the participants who viewed the non-matched control message. There was also an interaction effect for Topic Matching and Values Matching: when there was Values NonMatching, it did not seem to matter whether there was Topic Matching (Bars) or Topic NonMatching (Points of Interest); however, when there was Values Matching, participants who viewed the message on a Topic NonMatching (Spiritual Organizations) web page thought the decision to binge drink required more thought than the participants who viewed the message on a Topic Matching (Health Organizations) web page.

It is possible that combining both types of context matching (topic and values) by presenting a message discouraging binge drinking on a website specifically related to Health Organizations promoting healthy alcohol consumption and healthy nutrition may be perceived in a negative fashion; it may come across as a lecture and the information is being forced on them (we kept presenting them with the same message: the PSA plus the information about the health organizations).

It is also possible that because the message and the web page provided the same type of information, the students did not gain anything extra from the message. In this context, the message did not add anything to what participants would expect on the health organizations web page, so it was redundant with the implied content on the page. If the PSA just overlapped with the general content of the web page, it should not necessarily be expected to have much more of an effect than the web page itself.

On the other hand, participants may think the decision to binge drink requires more thought when the message is presented on a Values Matching/Topic NonMatching web page (the Spiritual Organizations web page) because it invokes ideas about the students' own spirituality and their thoughts about what is "right vs. wrong" and what they "should" do. This type of

website context may make the student more thoughtful, thus more likely to report that the decision to binge drink is important and requires more thought.

Another reason students may become more thoughtful when receiving the PSA on the Topic Non-Matching web page could be due to expectancy disconfirmation (Maheswaran & Chaiken, 1991). It is possible that because the PSA topic does not match the Spiritual Organizations web page that it creates an expectancy violation, which increases participants' processing of the message. On the other hand, receiving the PSA on the Topic Matching web page related to Health Organizations would be consistent with expectancies given that the message and web page present the same type of information, and thus processing of the message would not increase.

Appropriateness of the Message to the Context. The matching interventions also influenced participants' perceptions of how appropriate the message was in the context it was presented. Students think it is more appropriate to view a message encouraging them to drink responsibly on a Topic Matching website (Bars or Health Organizations) rather than Topic NonMatching webpage (Points of Interest or Spiritual Organizations). Expectancy confirmation may be playing a role in this effect. Students are more likely to expect to be presented with a PSA discouraging binge drinking on a Topic Matching web page, thus they perceive these contexts as more appropriate for the message.

Further, students think only one type of context matching is appropriate, instead of matching both or neither. Participants thought the most appropriate context was the Bars web page (Topic Matched / Values NonMatched), and the least appropriate context was Points of Interest (Topic NonMatched/ Values NonMatched). Not surprisingly, students perceived the message to be more appropriate on a Topic Matching web page; however, it is interesting that

they specifically thought it was more appropriate to see it on the Bars webpage, which is a Values NonMatched context compared to a context that was promoting similar values (i.e., an overall similar message as in the Health Organization web page). In the Bars context, participants received competing values (i.e., go drinking, but drink responsibly). It is possible that they considered the Bars web page a more appropriate context than Health Organizations because, again, the message was redundant with the information already provided on the Health Organizations page. Perhaps students think such redundancy is inappropriate. It would be similar to presenting a PSA encouraging students to perform breast self-exam on the American Cancer Society website which already provides information related to breast self-exam. Again, in this case, the PSA would be redundant with the web page content and could be perceived as inappropriate.

An additional explanation could be that students prefer this type of context with competing values because, again, rather than being presented with a lecture promoting health and responsible drinking (as in the Health Organizations web page), the overall presentation on the Bars web page is suggesting “We know you are going to drink, but try to be responsible about it”, which suggests that they are adults that can make their own decisions rather than children that need to be lectured to.

Message Attractiveness. There was a similar effect for participants’ perceptions of how attractive the message is. Students think the message is more attractive in the Bars context or Spiritual Organizations context, rather than the Health Organizations or Points of Interest contexts. In other words, students prefer one type of matching rather than both types of matching being used simultaneously or no matching being used at all. It seems as though participants’ perceptions of the attractiveness or likeability of the message may be influenced by

their perceptions of how appropriate it is in the context. It could be that people have difficulty distinguishing between what is “good” in general and what is appropriate given the context. Participants’ judgments about appropriateness may influence their perceptions of “goodness” or attractiveness of the message, which could explain why participants’ attitudes about the message are more influenced by the context matching manipulations compared to the schema matching.

A possible explanation for students not finding the message attractive when presented on the Health Organizations web page is that the message was redundant with the information on the web page. The students viewed a message discouraging binge drinking on a web page about organizations that discourage drinking and encourage making healthy choices. It could be that because the message was congruent with both the topic and values of the web page, it did not add anything extra to the web page, and students easily dismissed it and did not find the message particularly memorable.

Again, students may also find the message more attractive when it is not being presented as a lecture. In the Health Organizations context, the message discouraging binge drinking may seem like a demand or order, instead of a helpful suggestion. Instead when the message is presented in the Bars or Spiritual Organizations contexts, it may be perceived more like a request or suggestion rather than an authority figure telling them what to do. In situations such as this, it is understandable that the student may show reactance if perceiving they are being presented with a lecture and that they would not find the message attractive or likeable.

Participants also do not like the message as much if it is presented in a context that matches neither the topic nor values of the message (Points of Interest). This suggests that it is important to make some effort in matching the context when presenting a message.

How Interesting and Informative the Message Is. The matching interventions had no influence on participants' perceptions of how interesting and informative the message was. Generally it is expected that schema matching messages are perceived as more interesting than schema non-matched messages (e.g., Pilling & Brannon, 2007; see also Study 1 Results). That this was not found in Study 2 is not concerning given that the schema matching manipulation and the two context manipulations were introduced simultaneously. The context matching effects may have washed out any effects expected if we had investigated schema matching alone. As mentioned in the previous section, the context manipulations may be influencing how students are evaluating message quality which may drown out the schema matching effect. Schema matching may not be found to influence students' perceptions of the message because the context manipulations are influencing their perceptions of the messages.

Support for Schema Matching

Although main effects for schema matching may not have been found for the dependent measures related to attitudes about the message, main effects for schema matching were found for drinking intentions when staying in and the belief about binge drinking being an important decision that requires a lot of thought. Although students may report that the schema matching manipulation did not influence them, clearly it did by way of a reduced intention to drink while staying in during the next week and an increased belief that the decision to binge drink is important and requires a lot of thought. They do not have to like the messages to be influenced by the messages. This can be illustrated by an example of people's reaction to a graphic anti-abortion advertisement. People may report that they do not like an ad which includes a picture of an aborted fetus, but they still may be influenced by it in terms of their attitudes and behaviors.

They may begin to think that abortion is a more serious decision than they first thought, and they may be more likely to advise people against seeking an abortion in the future.

Support for Topic Matching

Matching the topic of the context was found to reduce students' intentions for drinking on occasions when going out drinking. As mentioned in the Results section, it is quite promising (and uncommon) to find that such short, one-time presentations of messages can be found to influence participants' drinking *intentions* because intentions are considered the most proximal predictor of actual behavior (Ajzen, 1991).

In terms of the context manipulations, it appears that Topic Matching is more important than Values Matching within this research situation of presenting PSAs to discourage irresponsible drinking among undergraduates. However, Values Matching may be more important if research is tapping at something more value-related, or an issue that is very thoughtful. Results indicated that participants did not believe binge drinking to be a particularly important decision that requires a lot of thought ($M = 4.48$, $SD = 1.92$); the average indication is just above the midpoint, suggesting that students, on average, do not put a lot of thought into the decision to binge drink. While it is difficult to say whether the topic of binge drinking is value related or not (drinking may be value related for some students, but it probably is not so for all college students), it seems that there could be other behaviors that may be consistently value-related for students in general. Perhaps values matching would be more effective if the behavioral topic of the PSA was more consistently value-related for students. For example, the decision of cheating on a test or class assignment may be more influenced by a message set in a Values Matching context (such as the Spiritual Organizations web page used in this study).

Results also suggest that introducing a values-matching message on a web page will probably be more effective if it deals with a topic or issue that is not the primary focus of the webpage (e.g., presenting a PSA discouraging cheating on a Spiritual Organizations web page rather than a web page about the University Honors System –which would be values and topic matching). Students appear to not react well to both Values and Topic matching, perhaps because it provides information that is redundant to that on the web page being viewed. The non-matching context may violate the message recipient's expectancies, which influences them to think more about the message.

Average Drinking Behavior, Beliefs about Drinking, and Attitudes toward the Message

On average, students tended to think that binge drinking is a somewhat bad behavior in which to engage ($M = 5.55$, $SD = 1.45$; possible range from 1 to 7 with higher numbers indicating it is a worse behavior), and they tended to think the decision to binge drink is slightly important and requiring thought ($M = 4.48$, $SD = 1.92$). They tended to think that the message is not all that interesting and informative ($M = 3.42$, $SD = 1.44$, and they thought it was slightly attractive ($M = 4.82$, $SD = 1.14$).

Ninety-four out of 184 (51.1%) of the participants in this study qualify as binge drinkers. This figure was calculated by summing the number of males indicating they drink five or more alcoholic beverages on occasions they drink (either when going out or staying in) and the number of females indicating they drink four or more alcoholic beverages on occasions they drink, dividing by the total number of participants, then multiplying by 100. With gender analyzed separately, 62.9% (56 out of 89) of males would qualify as binge drinkers, and 40.0% (38 out of 95) of females would qualify as binge drinkers. When students go out drinking, on average, males drink 6.2 alcoholic beverages and females drink 4.3 alcoholic beverages. These

statistics, as do the figures presented in Study 1, provide evidence that more effort is needed to curb college student drinking.

Limitations / Implications for Future Research

Although these results are interesting to observe, the results are descriptive. It is difficult to explain why we observed the results we have. For example, it would be interesting to further determine why different types of matching are effective for reducing intentions to drink while staying in (schema matching is more effective) and intentions to drink when going out (topic matching is more effective). It makes sense that these results may be a function of the amount of social pressures for drinking present in the different drinking situations. However, it would be worthwhile to investigate these effects further and gain some insight into why college students are more receptive to different types of matching interventions for intentions to drink in different locations. Another pattern of results that needs more explanation is the Values Matching by Topic Matching interaction. It appears that students do not prefer being exposed to both types of matching. Therefore, more matching is not always better. We have attempted to explain possible reasons for these results, from violation of expectancies to a dislike of redundancy. However, further research should be conducted to gain insight to why more matching does not increase message effectiveness.

It is very promising that these matching interventions influenced students' intentions for drinking alcohol. Schema Matching reduced intentions for drinking while in, and Topic Matching reduced intentions for drinking while out. Ultimately, it would be even more promising if a change in actual behavior can be demonstrated as a result of these simple interventions. Further research can be conducted with the goal of measuring changes in actual drinking behavior. As it is unfeasible to follow students around to observe their drinking

behavior, the best option may be to have participants keep a drinking journal. Researchers can determine whether baseline drinking levels decrease after exposure to these interventions. If the interventions are found to be effective in reducing drinking behavior, they can be implemented on a larger scale on campuses.

Conclusions

Both Schema Matching and the two Context Matching factors are important to consider for interventions to discourage college student binge drinking. However, it is also important to take into account the drinking situation (going out or staying in) in attempts to reduce drinking. In terms of Context Matching factors, it seems that Topic Matching is more important than Values Matching. It appears that when discouraging behavior related to drinking while out, perhaps matching to the topic of the web page is sufficient, and the effort of schema-matching is unnecessary. Given the additional dangers associated with drinking while out (e.g., increased likelihood of drunk driving) compared to drinking while in, it is promising that perhaps including a PSA discouraging binge drinking on a web page advertising bar specials may be enough to get the student thinking about the issue and reduce their drinking intentions for that evening. The PSA also could be presented alongside the bar advertisements/alcohol specials posted in the college newspaper.

CHAPTER 4 - General Discussion

Overview of Research Issues

The current research used a website simulation to explore various factors that may be utilized to improve the effectiveness of Public Service Announcements (PSAs) to discourage irresponsible drinking among college students. One factor investigated in both studies was tailoring the PSA to the individual's personality. Tailoring to the actual self-schema has been found to be effective in past research (e.g., Pease, Brannon, & Pilling, 2006; Pilling & Brannon, 2007), but this research explored whether matching more thoroughly to the individual's personality (with the Big Five traits) or matching to who the individual would most like to be (with ideal self-schema) would be more effective. It was expected that tailoring to the more complicated and time-consuming Big Five personality traits would be more effective than matching to a simple selection of one of four possible self-schemas. However, contrary to expectations, in no instance was any other matching condition (Big Five or ideal self-schema) more effective than matching to actual self-schema. There appears to be a threshold of personalization related to PSAs, and matching beyond this point does not improve message effectiveness. Given that matching to the self-schema is much more simple and enjoyable for participants, it is suggested that future research continue to pursue matching to the self-schema.

Study 2 also investigated person matching using self-schema. The internet is a useful medium for presenting personalized PSAs because a computer program can easily tailor a message to an individual's previous responses. When presented over the internet, the PSA exists in a web page context, and it also is possible to match the PSA to this context. In Study 2, the

message (with the topic of drinking) was matched to the topic of the web page by presenting it with information related to bars/drinking or with information about health organizations that promote responsible drinking. The message (with values of behaving responsibly) was matched to the values of the web page by presenting it with information related to health organizations promoting responsible drinking (thus it was also matched to topic) or with information related to spiritual organizations on campus. Matching to context factors is easier than matching to each individual's personality. When matching to personality, the message for each recipient may be different. However, when matching to context factors, the message remains the same, but its placement may change. It is important to look at both Person Matching and Context Matching simultaneously to determine which is most influential on message effectiveness. Study 2 explored the relative effectiveness of Person Matching, Topic Matching, and Values Matching to evaluate whether matching to a context factor is sufficient, or whether matching to the individual person is necessary to improve message effectiveness. It was expected that context factors would also be important in the design of PSAs. Results reveal that both person matching and context matching factors are important when tailoring PSAs using the internet. Further, when matching to context factors, there also appears to be a threshold of personalization. More matching is not always better, as students did not react well to PSAs that were matched too thoroughly (are too redundant) to the website context.

The following section briefly describes the major findings of Study 1 and Study 2 separately. Next, the effectiveness of the person matching and context matching interventions investigated in this research are discussed, and practical implications for the implementation of PSAs discouraging binge drinking are suggested. Finally, limitations and suggestions for future research are discussed.

Experiment 1 Major Findings

Experiment 1 investigated the effects of one factor on students' attitudes and intentions for drinking: the extent to which the message was personalized to the recipient's personality or core values (Message Personalization). Message Personalization was manipulated such that a participant was assigned to one of four groups: the Big-Five matched message, the actual self-schema matched message, the ideal schema matched message, or the non-personalized control message. The purpose was to evaluate the relative effectiveness of different methods of personalizing a message to a student to discourage irresponsible drinking. The Big-Five condition was the most personalized (because it tailored the message most thoroughly to the participant), followed by the actual self-schema condition (because it tailored the message to the individual's current core needs and values, but in a more general way than the Big-Five condition), followed by the ideal schema condition (which matched the message to who the person would most like to be, rather than the person they currently believe themselves to be), and the control condition as least personalized. Matching to the actual self-schema has been shown to be effective in past research on discouraging binge drinking among college students (Pease, Brannon, & Pilling, 2006; Pilling & Brannon, 2007). The purpose of Experiment 1 was to evaluate whether matching more thoroughly to the person (using the Big Five personality traits) or matching to who the person would most like to be (using the ideal schema) would be even more effective than matching to the actual self-schema.

Experiment 1 results reveal that Big Five matching and ideal schema matching are not more effective than matching to the actual self-schema. Participants receiving the self-schema matched message believed binge drinking to be a worse behavior to engage in compared to participants receiving the other types of matching messages. Those receiving either the self-schema matched message or the Big-Five matched message thought the message was more

interesting and informative than those receiving the control message, while those receiving the ideal schema matched message did not differ from the control. The groups did not differ in terms of their intentions for drinking (for both going out and staying in) in the next week or their ratings of how attractive the message was. Because in no instance was matching to the Big Five or matching to ideal schema better than matching to the actual self-schema, it is suggested that future research related to discouraging binge drinking among college students continue to utilize the self-schema cards and match messages to the students' actual self-schema.

Experiment 2 Major Findings

Experiment 2 continued investigating *Person Matching*, this time just using a self-schema matched or non-matched message. However, a different type of message matching, *Context Matching*, was also explored in two ways, by matching a message to the *Topic* of the context and matching a message to the implied *Values* of the context. The relative effectiveness of person matching and these two types of context matching were investigated. There was an interest in determining whether the context makes a difference in message effectiveness. It was expected that context factors would be important in designing PSAs. The purpose of the research was to evaluate whether matching a message to the message context is sufficiently effective (which is very easy), whether taking the extra effort to tailor the message to an individual person is necessary to increase the effectiveness of the message, or whether using both types of matching (person and context) is the most effective.

Experiment 2 results revealed that *Person Matching* and both *Context Matching* factors are important when implementing anti-binge drinking interventions. The different types of matching were effective in different ways. *Self-schema Matching* was effective in reducing participants' intentions for drinking while staying in during the following week and in

convincing students that the decision to binge drink is an important one that requires a lot of thought. However, Topic Matching was effective in reducing intentions for drinking when going out in the next week, and it also increased how appropriate the message was perceived to be in the context it was presented. In terms of the context matching factors, matching a message to the topic of the context appears to be more important than matching it to the implied values of the context. In three instances there was a Topic by Values interaction; generally it appears that utilizing both types of context matching simultaneously is not received well by students. In other words, more matching is not always better. Matching to both the topic and values of the context led students to rate the message as less attractive, less appropriate, and believe that binge drinking is less an important behavior that requires a lot of thought. As there is a threshold of personalization in terms of matching to the person, there also appears to be a threshold to matching to the message context. Too much overlap or redundancy with the webpage itself may undermine the message's effectiveness. A message that is matched too thoroughly to the webpage context does not offer the viewer anything beyond the information already provided on the webpage. A message that is redundant with the webpage content appeared to be easily dismissed and unmemorable.

Assessing the Effectiveness of the Interventions

There are several ways to assess message persuasiveness, which vary in the stage of intentions toward the behavior. First, participants can indicate they have learned from the message. While this is steps away from actual intention to comply with the message, it indicates that the message recipient did receive new information, and if they think about this information more, over time it could influence them (Tesser, 1978). Next, participants can indicate that they like the message. This is better than indicating they learned something new from the message,

but it still is not an indication of intending to comply with the message. If message recipients like the message, they are more likely to remember it and be persuaded by it over time. Message acceptance (liking the message) is traditionally measured prior to implementing more time-consuming behavior change studies (Erlich, Haque, Swisher-McClure, & Helmkamp, 2006; Koski-Jannes & Cunningham, 2001; Kypri, Saunders, & Gallagher, 2003; Rudy, Rosenfeld, Galassi, Parker & Schanberg, 2001).

The next way a participant can indicate message persuasiveness is through a change in their beliefs, or attitudes, about the target behavior. While they might not intend to change their own behavior at this point, they have begun thinking differently about the behavior, and this is very likely to influence their actual behavior in time. As mentioned in the introduction, attitudes are assessed because they are thought to influence behavior either directly (Eagly & Chaiken, 1998; Petty & Wegener, 1998b) or through their influence on intentions (Ajzen & Fishbein, 1980). Then, as a further indication of message effectiveness, participants can actually indicate a reduced intention to engage in the target behavior. As intentions are thought to be the most proximal predictor of behavior, this is considered the best change to make without actually observing a change in behavior. If people intend to do something, they generally will do it, if they have control over doing it (Ajzen, 1991). More importantly, if people do not intend to do something, it is very unlikely that they will do it. DeJong and Langford (2002) note that preliminary, yet necessary, steps in drinking interventions are to influence participants' knowledge, attitudes, and intentions toward drinking. Measuring participants' changes in intentions for drinking is an accepted way of assessing intervention effectiveness (Koski-Jannes & Cunningham, 1996; Kypri, Saunders, & Gallagher, 2003).

The results of the current studies are very promising because we not only found indications that participants learned from the messages, they also indicated changes in their beliefs about the behavior and reductions in intentions to binge drink. Intentions for drinking were influenced in Study 2. Intentions to drink while in were reduced as a result of viewing a schema matched message, and intentions to drink while out were reduced as a result of viewing a topic matched message. Beliefs about binge drinking were influenced in both studies. In Study 1, participants who received the self-schema matched message believed binge drinking to be a worse behavior to engage in than those receiving the ideal schema matched message or the Big-Five matched message. In Study 2, participants who received the self-schema matched message reported that the decision to binge drink was a more important decision that requires a lot of thought, compared to the participants who viewed the non-matched control message. In Study 1, the self-schema matched message and the Big-Five matched message were more interesting and informative than the control message.

Support was demonstrated for the self-schema matching interventions in both Study 1 and Study 2, and support was demonstrated for the importance of context matching factors in Study 2. Results suggest that pursuit of Big Five matching is not warranted for interventions discouraging binge drinking in college students. In no instance did students react more favorably to the Big Five matching compared to the self-schema matching. Self-schemas offer an easy and enjoyable way to tailor a message to an individual's personality, and matching to them is sufficiently effective. Study 2 demonstrated that care must be taken when matching a message to both the topic and values of a web page; as a rule, it should not be done because it makes the message too redundant with the webpage. Further, Study 2 brings attention to the possibility that drinking in different contexts (when staying in or going out) need to be addressed with different

types of matching. Self-schema matching messages reduced intentions to drink while staying in, but topic matching messages reduced intentions for drinking when going out. Perhaps the best option for discouraging binge drinking across the board is to have self-schema matched messages on web pages with information about bars and drinking. However, given that drinking while out may be associated with more serious consequences, it would be useful to even present non-personalized PSAs on websites related to bars. This would be very simple, as it would not require tailoring the message to each individual viewing the website.

The results also suggest that the schema matching effect found consistently in past research may not be as robust if other manipulations are made simultaneously. Some schema matching effects found in Study 1 were not found in Study 2. For example, students in Study 2 did not report the schema matched messages were more interesting and informative than the control message. The schema matching effects may have been drowned out by the context manipulations. Another possible reason the schema matching effect was not as consistent in Study 2 is that the messages were significantly shorter than those used in Study 1. Perhaps because the messages were so short, participants in Study 2 were less likely to think they were influencing them, even though they still were (in beliefs about binge drinking being an important decision that requires a lot of thought, and in intentions for drinking when staying in). Even though the students in Study 2 did not appear to show increased acceptance of the schema matching messages, the researchers were not overly concerned given that the students did report reduced intentions for drinking while staying in. Intentions are the best predictor of behavior (Ajzen, 1991). The schema matching messages in Study 2 also increased students' thoughtfulness about the decision to binge drink.

Practical Implications

The results of the two studies have important implications for the design and implementation of Public Service Announcements. The results of Study 1 support that the message should be personalized to make it more effective. However, it also appears that there is probably some “threshold” of personalization that is required. The schema matching appears to be as effective as taking the extra effort to match to an individual’s Big Five traits. As long as the message clearly reflects the person’s needs and values sufficiently, adding more personalization might not be necessary.

Topic matching messages tend to be effective as well. If unable to match a message to the individual’s schema, topic matching can increase effectiveness of the message. Context matching factors may even be more important in certain situations, like when the student’s drinking is more influenced by the drinking context instead of their personal values. However, it also is important to keep in mind that, as with personality matching, with context matching factors there may be a threshold of matching. Although students respond well to topic matching messages, their reaction becomes less favorable when the message matches too closely to the web page (i.e., when both the topic and values of the web page match the message). When designing PSAs, it is important to avoid redundancy and not match the web page too well. Then, the message will be more likely to attract the viewer’s attention and be processed.

Limitations/ Implications for Future Research

In the current investigation, participants were required to view the public service announcement in the context of web pages chosen by the researcher. A more realistic situation would be to present the PSA in the context of real websites the student chooses to view during their own web surfing. In real life, students choose the websites they visit, and they might not

choose to visit a health web page or a spiritual web page. There may be differences in the reactions to the PSAs of people who would visit the type of web page that they viewed the message on compared to people who normally would never visit that type of web page. It is possible that people who would surf that type of web page in real life would react more favorably to a PSA presented on that web page. Future research could involve a field study in which participants are presented with the PSA in the context of a web page they select themselves.

Future research using the context matching PSAs could investigate varying levels of topic matching. It is likely that there are more than just two levels of topic matching (i.e., not just Topic Matching and Topic Non-Matching). Instead, it makes sense that there would be some intermediate level of Topic Matching. In the current study, the topic matching message was specifically related to drinking and the web page context topic was also mostly related to responsible drinking organizations. A different health behavior PSA (e.g., discouraging smoking, encouraging physical exercise) presented on this health web page could still match the topic of “health” but not match the topic as much as the PSA used in the current study. Alternately, the anti-binge drinking PSA could be presented on a web page describing health organizations not specifically related to discouraging drinking, like the Recreational Center and the Counseling Center. In this way, the PSA could match the topic of health, but not match to the exact health-related topic, thus being an intermediate topic match. This discrepancy between topics may be enough to violate expectancy and promote increased processing of the message (Maheswaran & Chaiken, 1991). It could be that the current health web page overlapped with the topic of binge drinking more than it needed to.

Instructions on the current website told participants to look around the site in a consistent manner so they would not miss any information, as they would be asked about it at a later time. However, there is no way to evaluate how much time students spent viewing each web page, the website as a whole, or the PSA. Future research could measure the amount of time the participant spends viewing each web page. This time could be used as a proxy for processing of the information.

The current studies assessed intervention effectiveness with measures of attitudes toward the message, beliefs toward the behavior, and intentions toward the behavior. Given that these were preliminary studies testing the comparative effectiveness of these different types of interventions, these were the most appropriate dependent measures to utilize. However, with the results of the studies showing these interventions can influence attitudes and intentions, further research can be conducted which actually attempts to measure changes in drinking behavior.

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Table 1 - Self-Schema Card Summary Descriptions

Warm-Communicative-Compassionate-Feeling Self-Schema:

I need to search for the meaning and significance of life. I want to make my life count and matter, to become my own authentic self. Integrity, harmony, and honesty are very important to me. I feel that I am highly idealistic and spiritual by nature.

Drawing: image of romantic couple, poetry book, diary, flowers, doves

Adventuresome-Skillful-Competitive-Spontaneous Self-Schema:

I need to be free to act on a moments notice, impulsively and spontaneously. I believe that life is to enjoy, so I thrive on fun, variety, and excitement. Living in the moment, I act on every opportunity.

Drawing: image of cowboy, rodeo, motorcycle, hunters, tools

Versatile-Wise-Conceptual-Curious Self-Schema:

I need freedom to pursue knowledge and wisdom and to develop competency by acquiring skills and capabilities. I think life is something to make sense of, to be understood and explained.

Drawing: image of professor, scientist, statue of "the thinker," globe, book

Responsible-Dependable-Helpful-Sensible Self-Schema:

I need to be responsible. I want to fulfill my duties and obligations, to organize and structure my life as I see fit. I am practical, sensible, and punctual and believe that people should earn their way through work and service to others.

Drawing: image of businessman, nurse, newspaper, American flag, calendar, piggy bank

Table 2 - Pretest Message Ratings: Means and Standard Deviations

	Mean Likert Ratings													
Intended Appeal	Resp Schema	Comm Schema	Curious Schema	Adv Schema	E	I (low E)	C	U (low C)	N	ES (low N)	O	CI (low O)	A	D (low A)
Resp schema	6.77 <i>0.57</i>	3.13 <i>1.57</i>	3.77 <i>1.83</i>	1.93 <i>0.94</i>	3.63 <i>1.56</i>	3.43 <i>1.68</i>	5.50 <i>1.78</i>	2.17 <i>1.12</i>	2.87 <i>1.46</i>	4.13 <i>2.00</i>	4.03 <i>1.30</i>	3.23 <i>1.57</i>	4.47 <i>1.68</i>	2.70 <i>1.24</i>
Comm schema	3.03 <i>1.45</i>	6.93 <i>0.25</i>	2.97 <i>1.52</i>	2.67 <i>1.27</i>	4.20 <i>1.67</i>	3.23 <i>1.72</i>	4.23 <i>1.57</i>	2.40 <i>0.97</i>	2.90 <i>1.56</i>	4.10 <i>1.71</i>	4.13 <i>1.57</i>	2.80 <i>1.45</i>	4.93 <i>1.68</i>	2.53 <i>1.33</i>
Curious schema	3.73 <i>1.91</i>	3.13 <i>1.41</i>	6.77 <i>0.68</i>	2.97 <i>1.50</i>	3.80 <i>1.69</i>	3.30 <i>1.60</i>	4.63 <i>1.67</i>	2.33 <i>1.21</i>	3.20 <i>1.40</i>	3.97 <i>1.50</i>	4.43 <i>1.68</i>	2.70 <i>1.39</i>	4.13 <i>1.46</i>	2.60 <i>1.28</i>
Adv Schema	2.53 <i>1.33</i>	2.80 <i>1.49</i>	2.90 <i>1.42</i>	6.90 <i>0.31</i>	5.63 <i>1.69</i>	1.73 <i>0.83</i>	3.57 <i>1.59</i>	3.27 <i>1.39</i>	2.67 <i>1.60</i>	4.33 <i>1.79</i>	4.43 <i>2.01</i>	2.30 <i>1.26</i>	3.97 <i>1.69</i>	2.83 <i>1.18</i>
E	3.00 <i>1.44</i>	3.50 <i>1.70</i>	3.13 <i>1.53</i>	5.17 <i>1.78</i>	6.60 <i>0.67</i>	1.43 <i>0.77</i>	3.57 <i>1.43</i>	2.97 <i>1.59</i>	2.97 <i>1.59</i>	4.00 <i>1.70</i>	4.23 <i>1.70</i>	2.57 <i>1.19</i>	4.33 <i>1.75</i>	2.63 <i>1.25</i>
I (low E)	4.00 <i>1.93</i>	4.10 <i>1.75</i>	3.73 <i>1.55</i>	2.03 <i>1.10</i>	1.60 <i>0.86</i>	6.63 <i>0.49</i>	4.13 <i>1.70</i>	2.67 <i>1.35</i>	3.50 <i>1.63</i>	3.40 <i>1.38</i>	2.57 <i>1.10</i>	4.47 <i>1.63</i>	4.13 <i>1.61</i>	2.80 <i>1.32</i>
C	5.90 <i>1.58</i>	3.37 <i>1.22</i>	4.17 <i>1.62</i>	2.33 <i>1.09</i>	3.53 <i>1.28</i>	3.70 <i>1.34</i>	6.67 <i>0.48</i>	1.40 <i>0.56</i>	2.93 <i>1.46</i>	4.17 <i>1.46</i>	3.73 <i>1.31</i>	3.63 <i>1.56</i>	4.17 <i>1.39</i>	2.93 <i>1.28</i>
U (low C)	2.10 <i>1.49</i>	2.97 <i>1.38</i>	2.50 <i>1.38</i>	4.33 <i>2.12</i>	3.70 <i>1.64</i>	3.10 <i>1.58</i>	1.83 <i>0.79</i>	6.67 <i>0.48</i>	3.23 <i>1.57</i>	3.27 <i>1.66</i>	3.60 <i>1.65</i>	3.20 <i>1.73</i>	3.20 <i>1.42</i>	3.27 <i>1.51</i>
N	3.33 <i>1.92</i>	3.40 <i>1.83</i>	2.80 <i>1.42</i>	2.33 <i>1.37</i>	2.47 <i>1.17</i>	4.27 <i>1.41</i>	3.43 <i>1.59</i>	3.40 <i>1.40</i>	6.67 <i>0.55</i>	1.60 <i>0.67</i>	3.10 <i>1.37</i>	3.90 <i>1.45</i>	3.27 <i>1.55</i>	4.10 <i>1.45</i>
ES (low N)	4.40 <i>1.81</i>	4.10 <i>1.52</i>	3.80 <i>1.61</i>	2.37 <i>1.27</i>	3.53 <i>1.43</i>	3.27 <i>1.23</i>	4.50 <i>1.59</i>	2.33 <i>0.92</i>	1.57 <i>0.68</i>	6.60 <i>0.62</i>	4.07 <i>1.28</i>	2.87 <i>1.17</i>	4.63 <i>1.61</i>	2.23 <i>1.01</i>

O	3.13 <i>1.55</i>	3.17 <i>1.64</i>	4.30 <i>1.97</i>	4.03 <i>1.83</i>	4.80 <i>1.54</i>	2.30 <i>1.06</i>	4.17 <i>1.34</i>	2.40 <i>1.22</i>	2.57 <i>1.36</i>	4.17 <i>1.66</i>	6.70 <i>0.53</i>	1.37 <i>0.56</i>	4.30 <i>1.56</i>	2.40 <i>1.04</i>
Cl (low O)	4.77 <i>2.01</i>	3.00 <i>1.36</i>	3.37 <i>1.52</i>	2.40 <i>1.63</i>	2.83 <i>1.42</i>	4.37 <i>1.43</i>	4.30 <i>1.73</i>	2.73 <i>1.39</i>	3.53 <i>1.66</i>	3.13 <i>1.43</i>	2.00 <i>1.05</i>	6.60 <i>0.56</i>	3.53 <i>1.57</i>	3.30 <i>1.24</i>
A	3.93 <i>1.70</i>	5.43 <i>1.61</i>	3.53 <i>1.63</i>	2.63 <i>1.40</i>	3.90 <i>1.37</i>	3.23 <i>1.57</i>	4.53 <i>1.66</i>	2.30 <i>1.34</i>	2.47 <i>1.17</i>	4.23 <i>1.61</i>	4.40 <i>1.28</i>	2.70 <i>1.49</i>	6.67 <i>0.55</i>	1.43 <i>0.68</i>
D (low A)	3.47 <i>1.76</i>	2.60 <i>1.43</i>	3.30 <i>1.60</i>	2.73 <i>1.41</i>	3.00 <i>1.39</i>	3.93 <i>1.41</i>	3.80 <i>1.37</i>	2.97 <i>1.40</i>	4.20 <i>1.49</i>	2.87 <i>1.25</i>	3.13 <i>1.38</i>	3.87 <i>1.66</i>	2.10 <i>0.96</i>	6.53 <i>0.57</i>
Neutral	3.83 <i>2.12</i>	3.20 <i>1.73</i>	3.27 <i>1.87</i>	3.50 <i>1.74</i>	4.03 <i>1.77</i>	3.03 <i>1.35</i>	3.77 <i>1.94</i>	3.23 <i>1.65</i>	3.43 <i>1.77</i>	3.60 <i>1.87</i>	3.50 <i>1.68</i>	3.27 <i>1.64</i>	3.53 <i>1.74</i>	3.47 <i>1.59</i>

Note. Resp schema = Responsible Schema
Comm schema = Communicative Schema
Curious schema = Curious Schema
Adv schema = Adventurous Schema
E = Extraversion
I = Introversion (low Extraversion)
C = Conscientiousness
U = Unmotivated (low Conscientiousness)
N = Neuroticism
ES = Emotionally Stable (low Neuroticism)
O = Openness
Cl = Closed (low Openness)
A = Agreeable
D = Disagreeable (low Agreeableness)

Note. Wording of messages can be found in Appendix A.

Table 3 - Experiment 1: Intended Number of Alcoholic Beverages Consumed on Occasions When Going Out Drinking in the Next Week as a Function of Message Personalization and Gender: Estimated Marginal Means and Standard Errors

Gender	Message Personalization				Total
	Control	Ideal Schema Matched	Self-Schema Matched	Big-Five Matched	
Male					
Mean	2.01	3.50	2.63	3.79	2.99
SE	1.17	1.11	1.24	1.03	0.59
N	12	13	11	15	51
Female					
Mean	3.16	2.61	2.69	3.57	3.00
SE	0.60	0.65	0.63	0.62	0.31
N	44	39	41	41	165
Total					
Mean	2.59	3.06	2.66	3.68	
SE	0.66	0.64	0.69	0.60	
N	56	52	52	56	

Note. Exact wording of item was "How many drinks in one night (when going out drinking in the next week) ___". Covariates appearing in model are evaluated at the following values: Typical number of drinks consumed on occasions when going out drinking = 3.16 and Social desirability = 5.49.

Table 4 - Experiment 1: Intended Number of Alcoholic Beverages Consumed on Occasions When Staying In Drinking in the Next Week as a Function of Message Personalization and Gender: Estimated Marginal Means and Standard Errors

Gender	Message Personalization				<u>Total</u>
	Control	Ideal Schema Matched	Self-Schema Matched	Big-Five Matched	
Male					
Mean	1.57	1.29	1.24	1.98	1.52
SE	0.88	0.82	0.88	0.75	0.43
N	12	13	11	15	51
Female					
Mean	1.03	0.85	0.80	1.40	1.02
SE	0.44	0.47	0.46	0.46	0.23
N	44	39	39	41	165
Total					
Mean	1.30	1.07	1.02	1.69	
SE	0.49	0.47	0.50	0.44	
N	56	52	52	56	

Note. Exact wording of item was “How many drinks in one night (when staying in drinking in the next week) ___”. Covariates appearing in model are evaluated at the following values: Typical number of drinks consumed on occasions when staying in drinking = 1.06 and Social desirability = 5.49.

Table 5 - Experiment 1: Intended Number of Alcoholic Beverages Consumed on Occasions When Going Out Drinking in the Next Week as a Function of Message Personalization and Gender: ANCOVA

Source	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	Partial η^2
<i>Typical # drinks when out</i>	1.726	1	1.726	0.110	.001
<i>Social Desirability</i>	0.211	1	0.211	0.013	.000
Message Condition (M)	30.33	3	10.11	0.642	.009
Gender (G)	0.01	1	0.01	0.001	.000
M × G	20.59	3	6.86	0.436	.006
Error	3245.39	206			
Total	5269.25	216			

Note. Exact wording of item: “How many drinks in one night (when going out drinking in the next week) ___”.

Table 6 - Experiment 1: Intended Number of Alcoholic Beverages Consumed on Occasions When Staying In Drinking in the Next Week as a Function of Message Personalization and Gender: ANCOVA

Source	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	Partial η^2
<i>Typical # drinks when in</i>	19.46	1	19.46	2.30	.011
<i>Social Desirability</i>	2.15	1	2.15	0.254	.001
Message Condition (M)	11.30	3	3.77	0.444	.006
Gender (G)	8.44	1	8.44	0.996	.005
M × G	0.14	3	0.05	0.005	.000
Error	1745.44	206	8.47		
Total	2090.00	216			

Note. Exact wording of item: “How many drinks in one night (when staying in drinking in the next week) ___”.

Table 7 - Experiment 1: Overall Persuasiveness of Message as a Function of Message Personalization and Gender: MANCOVA

Source	<i>Wilks' Lambda</i>	<i>Hypothesized df</i>	<i>Error df</i>	<i>F</i>	Partial η^2
<i>Typical # drinks when out</i>	.71	3	203	27.47***	.29
<i>Typical # drinks when in</i>	.94	3	203	4.31**	.06
<i>Social Desirability</i>	.97	3	203	2.02	.03
Message Condition (M)	.90	9	494	2.42*	.03
Gender (G)	.95	3	203	3.96**	.06
M x G	.94	9	494	1.46	.02

Note. Dependent measures included in analysis are composites of how interesting and informative the message is [Exact wording of the three items in the index are “The message on the website about binge drinking was interesting,” “I learned something from the message,” and “I received new information from the message” all measured on 7-point Likert scales (1 = Disagree Strongly / 7 = Agree Strongly)], how attractive the message is [Exact wording of three items in the composite: “I (dislike/like) the message,” “I react (unfavorably/favorably) to the message,” and “I feel (negatively/positively) to the message” all measured on 7-point Likert scales], and a belief about how bad of a behavior binge drinking is [Exact wording of three items in composite: “I (like/dislike) binge drinking,” “I feel (positive/negative) toward binge drinking,” and “Binge drinking is (nice/awful)” all measured on 7-point Likert scales].

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

Table 8 - Experiment 1: Belief that Binge Drinking is a Bad Behavior as a Function of Message Personalization and Gender: Estimated Marginal Means and Standard Errors

Gender	Message Personalization				<u>Total</u>
	Control	Ideal Schema Matched	Self-Schema Matched	Big-Five Matched	
Male					
Mean	6.28	5.37	6.60	5.35	5.90
SE	0.35	0.32	0.36	0.30	0.17
N	12	13	11	15	51
Female					
Mean	5.29	5.26	5.31	5.18	5.26
SE	0.17	0.19	0.18	0.18	0.09
N	44	39	41	41	165
Total					
Mean	5.78	5.31	5.95	5.27	
SE	0.19	0.19	0.20	0.17	
N	56	52	52	56	

Note. Exact wording of three items in composite: “I (like/dislike) binge drinking,” “I feel (positive/negative) toward binge drinking,” and “Binge drinking is (nice/awful)” all measured on 7-point Likert scales. Covariates appearing in model are evaluated at the following values: Typical number of drinks consumed on occasions when going out drinking = 3.16, Typical number of drinks consumed on occasions when staying in drinking = 1.06, and Social desirability = 5.49.

Table 9 - Experiment 1: Belief that Binge Drinking is a Bad Behavior as a Function of Message Personalization and Gender: ANCOVA

Source	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	Partial η^2
<i>Typical # drinks when out</i>	106.96	1	106.95	81.82***	.29
<i>Typical # drinks when in</i>	16.26	1	16.26	12.44***	.06
<i>Social Desirability</i>	2.03	1	2.03	1.55	.01
Message Condition (M)	12.94	3	4.31	3.30*	.05
Gender (G)	13.22	1	13.22	10.12**	.05
M × G	9.57	3	9.57	2.44	.03
Error	267.98	205	1.31		
Total	6738.22	216			

Note. Exact wording of three items in composite: "I (like/dislike) binge drinking," "I feel (positive/negative) toward binge drinking," and "Binge drinking is (nice/awful)" all measured on 7-point Likert scales.

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

Table 10 - Experiment 1: How Interesting and Informative the Message Is as a Function of Message Personalization and Gender: Estimated Marginal Means and Standard Errors

Gender	Message Personalization				<u>Total</u>
	Control	Ideal Schema Matched	Self-Schema Matched	Big-Five Matched	
Male					
Mean	3.54	4.06	4.38	4.41	4.10
SE	0.40	0.37	0.41	0.34	0.20
N	12	13	11	15	51
Female					
Mean	3.93	4.30	4.69	4.70	4.40
SE	0.20	0.22	0.21	0.21	0.10
N	44	39	41	41	165
Total					
Mean	3.73	4.18	4.54	4.55	
SE	0.22	0.21	0.23	0.20	
N	56	52	52	56	

Note. Exact wording of the three items in the index are “The message on the website about binge drinking was interesting,” “I learned something from the message,” and “I received new information from the message” all measured on 7-point Likert scales (1 = Disagree Strongly / 7 = Agree Strongly).

Covariates appearing in model are evaluated at the following values: Typical number of drinks consumed on occasions when going out drinking = 3.16, Typical number of drinks consumed on occasions when staying in drinking = 1.06, and Social desirability = 5.49.

Table 11 - Experiment 1: How Attractive the Message Is as a Function of Message Personalization and Gender: Estimated Marginal Means and Standard Errors

Gender	Message Personalization				Total
	Control	Ideal Schema Matched	Self-Schema Matched	Big-Five Matched	
Male					
Mean	5.39	5.36	4.85	4.81	5.10
SE	0.36	0.34	0.37	0.31	0.18
N	12	13	11	15	51
Female					
Mean	4.88	5.16	5.43	5.21	5.17
SE	0.18	0.19	0.19	0.19	0.09
N	44	39	41	41	165
Total					
Mean	5.13	5.26	5.14	5.01	
SE	0.20	0.19	0.21	0.18	
N	56	52	52	56	

Note. Exact wording of three items in the composite: “I (dislike/like) the message,” “I react (unfavorably/ favorably) to the message,” and “I feel (negatively/positively) to the message” all measured on 7-point Likert scales. Covariates appearing in model are evaluated at the following values: Typical number of drinks consumed on occasions when going out drinking = 3.16, Typical number of drinks consumed on occasions when staying in drinking = 1.06, and Social desirability = 5.49.

Table 12 - Experiment 1: How Interesting and Informative the Message is as a Function of Message Personalization and Gender: ANCOVA

Source	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	Partial η^2
<i>Typical # drinks when out</i>	0.08	1	0.08	0.05	.00
<i>Typical # drinks when in</i>	0.18	1	0.18	0.10	.00
<i>Social Desirability</i>	5.98	1	5.98	3.48	.02
Message Condition (M)	16.36	3	5.45	3.18*	.04
Gender (G)	3.08	1	3.08	1.79	.01
M × G	0.11	3	0.03	0.02	.00
Error	352.00	205	1.72		
Total	4431.44	216			

Note. Exact wording of the three items in the index are “The message on the website about binge drinking was interesting,” “I learned something from the message,” and “I received new information from the message” all measured on 7-point Likert scales (1 = Disagree Strongly / 7 = Agree Strongly).

* $p < .05$

Table 13 - Experiment 1: How Attractive the Message Is as a Function of Message Personalization and Gender: ANCOVA

Source	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	Partial η^2
<i>Typical # drinks when out</i>	5.39	1	5.39	3.84*	.02
<i>Typical # drinks when in</i>	1.79	1	1.79	1.28	.01
<i>Social Desirability</i>	4.00	1	4.00	2.84	.01
Message Condition (M)	1.31	3	0.44	0.31	.01
Gender (G)	0.15	1	0.15	0.11	.00
M × G	7.09	3	2.36	1.68	.02
Error	288.18	205	1.41		
Total	6040.89	216			

Note. Exact wording of three items in the composite: “I (dislike/like) the message,” “I react (unfavorably/favorably) to the message,” and “I feel (negatively/positively) to the message” all measured on 7-point Likert scales.

* $p < .05$

Table 14 - Experiment 2: Intended Number of Alcoholic Beverages Consumed on Occasions When Going Out Drinking in the Next Week as a Function of Schema Matching, Topic Matching, Values Matching, and Gender: Estimated Marginal Means and Standard Errors

Relationship of Webpage to Message							
<i>Message</i>	Topic Non-Matching			Topic Matching			<u>Total</u>
	Values Non-Matching	Values Matching	Total	Values Non-Matching	Values Matching	Total	
Schema							
Non-Matching							
Male							
Mean	4.27	4.61	4.44	3.51	3.78	3.65	4.04
SE	0.34	0.35	0.25	0.38	0.34	0.26	0.18
N	12	11	23	9	12	21	44
Female							
Mean	3.81	3.87	3.84	3.82	3.64	3.73	3.79
SE	0.36	0.33	0.25	0.33	0.33	0.23	0.17
N	10	12	22	12	12	24	46
<i>Total</i>							
Mean	4.04	4.24	4.14	3.67	3.71	3.69	3.91
SE	0.25	0.24	0.17	0.25	0.23	0.17	0.12
N	22	23	45	21	24	45	90
Schema							
Matching							
Male							
Mean	3.57	3.40	3.49	3.02	3.62	3.32	3.41
SE	0.35	0.35	0.24	0.41	0.35	0.27	0.18
N	11	11	22	8	11	19	41
Female							
Mean	4.21	4.00	4.10	3.67	3.61	3.64	3.87
SE	0.34	0.35	0.24	0.33	0.33	0.24	0.17
N	12	11	23	12	12	24	47

<i>Total</i>							
Mean	3.89	3.70	3.79	3.35	3.62	3.48	3.64
<i>SE</i>	<i>0.24</i>	<i>0.24</i>	<i>0.17</i>	<i>0.26</i>	<i>0.24</i>	<i>0.18</i>	<i>0.12</i>
<i>N</i>	<i>23</i>	<i>22</i>	<i>45</i>	<i>20</i>	<i>23</i>	<i>43</i>	<i>88</i>
<hr/>							
TOTAL							
<hr/>							
Male							
Mean	3.92	4.01	3.96	3.27	3.70	3.49	3.72
<i>SE</i>	<i>0.24</i>	<i>0.25</i>	<i>0.17</i>	<i>0.28</i>	<i>0.24</i>	<i>0.19</i>	<i>0.13</i>
<i>N</i>	<i>23</i>	<i>22</i>	<i>45</i>	<i>17</i>	<i>23</i>	<i>40</i>	<i>85</i>
Female							
Mean	4.01	3.93	3.97	3.75	3.62	3.69	3.83
<i>SE</i>	<i>0.25</i>	<i>0.24</i>	<i>0.17</i>	<i>0.23</i>	<i>0.24</i>	<i>0.17</i>	<i>0.12</i>
<i>N</i>	<i>22</i>	<i>23</i>	<i>45</i>	<i>24</i>	<i>24</i>	<i>48</i>	<i>93</i>
Total							
Mean	3.96	3.97	3.97	3.51	3.66	3.59	
<i>SE</i>	<i>0.17</i>	<i>0.17</i>	<i>0.12</i>	<i>0.18</i>	<i>0.17</i>	<i>0.12</i>	
<i>N</i>	<i>45</i>	<i>45</i>	<i>90</i>	<i>41</i>	<i>47</i>	<i>88</i>	

Note. Exact wording of item was "How many drinks in one night (when going out drinking in the next week) ___".
Covariates appearing in model are evaluated at the following values: Typical number of drinks consumed on occasions when going out drinking = 3.99 and Social desirability = 5.20.

Table 15 - Experiment 2: Intended Number of Alcoholic Beverages Consumed on Occasions When Staying In Drinking in the Next Week as a Function of Schema Matching, Topic Matching, Values Matching, and Gender: Estimated Marginal Means and Standard Errors

Relationship of Webpage to Message							
<i>Message</i>	Topic Non-Matching			Topic Matching			<u>Total</u>
	Values Non-Matching	Values Matching	Total	Values Non-Matching	Values Matching	Total	
<i>Personalization</i>							
Schema							
Non-Matching							
Male							
Mean	2.57	2.41	2.49	2.03	2.85	2.44	2.46
SE	0.43	0.45	0.31	0.49	0.43	0.33	0.23
N	12	11	23	9	12	21	44
Female							
Mean	2.08	1.98	2.03	1.91	1.95	1.93	1.98
SE	0.47	0.43	0.32	0.43	0.43	0.30	0.22
N	10	12	22	12	12	24	46
<i>Total</i>							
Mean	2.33	2.19	2.26	1.97	2.40	2.19	2.22
SE	0.32	0.31	0.22	0.33	0.30	0.22	0.16
N	22	23	45	21	24	45	90
Schema							
Matching							
Male							
Mean	2.10	1.46	1.78	1.33	2.02	1.67	1.73
SE	0.45	0.46	0.32	0.50	0.45	0.34	0.23
N	11	11	22	9	11	20	42
Female							
Mean	1.76	1.94	1.85	1.76	1.60	1.68	1.76
SE	0.43	0.45	0.31	0.44	0.43	0.31	0.22
N	12	11	23	11	12	23	46

<i>Total</i>							
Mean	1.93	1.70	1.82	1.54	1.81	1.68	1.75
SE	0.31	0.32	0.22	0.33	0.31	0.23	0.16
N	23	22	45	20	23	43	88
<hr/>							
<i>TOTAL</i>							
<hr/>							
Male							
Mean	2.34	1.94	2.14	1.68	2.44	2.06	2.10
SE	0.31	0.32	0.23	0.35	0.31	0.24	0.16
N	23	22	45	18	23	41	86
Female							
Mean	1.92	1.96	1.94	1.83	1.78	1.81	1.87
SE	0.32	0.31	0.23	0.31	0.30	0.22	0.16
N	22	23	45	23	24	47	92
<i>Total</i>							
Mean	2.13	1.95	2.04	1.76	2.11	1.93	
SE	0.22	0.22	0.16	0.23	0.22	0.16	
N	45	45	90	41	47	88	

Note. Exact wording of item was "How many drinks in one night (when staying in drinking in the next week) ___". Covariates appearing in model are evaluated at the following values: Typical number of drinks consumed on occasions when staying in drinking = 2.00, and Social desirability = 5.20.

Table 16 - Experiment 2: Intended Number of Alcoholic Beverages Consumed on Occasions When Going Out Drinking in the Next Week as a Function of Schema Matching, Topic Matching, Values Matching, and Gender: ANCOVA

Source	SS	df	MS	F	Partial η^2
<i>Typical # drinks when out</i>	1675.97	1	1675.97	1283.61***	.89
<i>Social Desirability</i>	0.68	1	0.68	0.52	.00
Schema Matching (S)	3.22	1	3.22	2.47	.02
Topic Matching (T)	6.33	1	6.33	4.85*	.03
Values Matching (V)	0.29	1	0.29	0.22	.00
Gender (G)	0.44	1	0.44	0.34	.00
S x T	0.21	1	0.21	0.16	.00
S x V	0.08	1	0.08	0.06	.00
T x V	0.25	1	0.25	0.19	.00
S x T x V	1.02	1	1.02	0.78	.01
S x G	5.57	1	5.57	4.27*	.03
T x G	0.39	1	0.39	0.30	.00
S x T x G	2.53	1	2.53	1.94	.01
V x G	1.41	1	1.41	1.08	.01
S x V x G	0.00	1	0.00	0.00	.00
T x V x G	0.43	1	0.43	0.33	.00
S x T x V x G	0.14	1	0.14	0.11	.00
Error	208.91	160	1.31		
Total	4837.75	178			

Note. Exact wording of item was "How many drinks in one night (when going out drinking in the next week) ___".
 * $p < .05$; *** $p < .001$

Table 17 - Experiment 2: Intended Number of Alcoholic Beverages Consumed on Occasions When Staying In Drinking in the Next Week as a Function of Schema Matching, Topic Matching, Values Matching, and Gender: ANCOVA

Source	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	Partial η^2
<i>Typical # drinks when in</i>	<i>807.53</i>	<i>1</i>	<i>807.53</i>	<i>372.86***</i>	<i>.70</i>
<i>Social Desirability</i>	<i>2.64</i>	<i>1</i>	<i>2.64</i>	<i>1.22</i>	<i>.01</i>
Schema Matching (S)	9.83	1	9.83	4.54*	.03
Topic Matching (T)	0.50	1	0.50	0.23	.00
Values Matching (V)	0.31	1	0.31	0.14	.00
Gender (G)	2.00	1	2.00	0.92	.01
S x T	0.05	1	0.05	0.02	.00
S x V	0.19	1	0.19	0.09	.00
T x V	3.12	1	3.12	1.44	.01
S x T x V	0.01	1	0.01	0.01	.00
S x G	2.94	1	2.94	1.36	.01
T x G	0.03	1	0.03	0.02	.00
S x T x G	0.00	1	0.00	0.00	.00
V x G	0.39	1	0.39	0.18	.00
S x V x G	0.33	1	0.33	0.15	.00
T x V x G	4.29	1	4.29	1.98	.01
S x T x V x G	0.45	1	0.45	0.21	.00
Error	346.52	160	2.17	0.11	
Total	2122.00	178			

Note. Exact wording of item was "How many drinks in one night (when staying in drinking in the next week) ___".
 * $p < .05$; *** $p < .001$

Table 18 - Experiment 2: Overall Persuasiveness of Message as a Function of Schema Matching, Topic Matching, Values Matching, and Gender: MANCOVA

Source	<i>Wilks' Lambda</i>	<i>Hypothesized df</i>	<i>Error df</i>	<i>F</i>	Partial η^2
<i>Typical # drinks when out</i>	.74	5	161	11.45***	.26
<i>Typical # drinks when in</i>	.95	5	161	1.71	.05
<i>Social Desirability</i>	.96	5	161	1.24	.04
Schema Matching (S)	.94	5	161	2.04	.06
Topic Matching (T)	.86	5	161	5.30***	.14
Values Matching (V)	.99	5	161	0.17	.01
Gender (G)	.96	5	161	1.39	.04
S x T	.99	5	161	0.31	.01
S x V	.97	5	161	0.87	.03
T x V	.92	5	161	2.80*	.08
S x T x V	.96	5	161	1.27	.04
S x G	.99	5	161	0.46	.01
T x G	.98	5	161	0.71	.02
S x T x G	.99	5	161	0.43	.01
V x G	.99	5	161	0.41	.01
S x V x G	.98	5	161	0.60	.02
T x V x G	.96	5	161	1.33	.04
S x T x V x G	.98	5	161	0.80	.02

Note. Dependent measures included in the analysis are composites of how interesting and informative the message is [Exact wording of the three items in the index are “The message on the website about binge drinking was interesting,” “I learned something from the message,” and “I received new information from the message” all measured on 7-point Likert scales (1 = Disagree Strongly / 7 = Agree Strongly)], how attractive the message is [Exact wording of three items in the composite: “I (dislike/like) the message,” “I react (unfavorably/favorably) to the message,” and “I feel (negatively/positively) to the message” all measured on 7-point Likert scales], how appropriate the message is in the context [Exact wording of items in the index was “How appropriate is the message in the context of the website you viewed?” (1 = Very Inappropriate / 7 = Very Appropriate) and “How relevant was the message to the content of the website you viewed?” (1 = Very Irrelevant / 7 = Very Relevant)], a belief related to how bad of a behavior binge drinking is [Exact wording of three items in composite: “I (like/dislike) binge

drinking,” “I feel (positive/negative) toward binge drinking,” and “Binge drinking is (nice/awful)” all measured on 7-point Likert scales], and an item assessing how important the decision to binge drink is [Exact wording of item is “Decisions about your drinking behavior require (Little / A lot of) thought” measured on a 7-point Likert scale].

* $p < .05$; *** $p < .001$

Table 19 - Experiment 2: Belief that Binge Drinking is a Bad Behavior as a Function of Schema Matching, Topic Matching, Values Matching, and Gender: Estimated Marginal Means and Standard Errors

Relationship of Webpage to Message							
<i>Message</i>	Topic Non-Matching			Topic Matching			<u>Total</u>
	Values Non-Matching	Values Matching	Total	Values Non-Matching	Values Matching	Total	
<i>Personalization</i>							
Schema							
Non-Matching							
Male							
Mean	5.74	5.12	5.43	5.62	5.23	5.42	5.43
SE	0.33	0.35	0.24	0.36	0.34	0.25	0.18
N	13	11	24	10	12	22	46
Female							
Mean	5.25	5.78	5.52	5.73	5.96	5.85	5.68
SE	0.35	0.34	0.25	0.33	0.33	0.24	0.17
N	11	12	23	12	12	24	47
<i>Total</i>							
Mean	5.49	5.45	5.47	5.68	5.84	5.59	5.55
SE	0.24	0.24	0.17	0.25	0.24	0.23	0.12
N	24	23	47	22	24	46	93
Schema							
Matching							
Male							
Mean	5.45	5.60	5.53	5.39	5.70	5.55	5.54
SE	0.35	0.34	0.24	0.39	0.35	0.26	0.18
N	11	12	23	9	11	20	43
Female							
Mean	5.17	6.08	5.63	5.79	5.04	5.41	5.52
SE	0.34	0.33	0.24	0.33	0.33	0.24	0.17
N	12	12	24	12	12	24	48
<i>Total</i>							
Mean	5.31	5.84	5.58	5.59	5.37	5.48	5.53

<i>SE</i>	0.24	0.24	0.17	0.26	0.24	0.18	0.12
<i>N</i>	23	24	47	21	23	44	91
<hr/>							
TOTAL							
<hr/>							
Male							
Mean	5.60	5.36	5.48	5.51	5.47	5.49	5.48
<i>SE</i>	0.24	0.25	0.17	0.27	0.24	0.18	0.13
<i>N</i>	24	23	47	19	23	42	89
Female							
Mean	5.21	5.93	5.57	5.76	5.50	5.63	5.60
<i>SE</i>	0.24	0.24	0.17	0.23	0.24	0.17	0.12
<i>N</i>	23	24	47	24	24	48	95
Total							
Mean	5.40	5.65	5.52	5.63	5.48	5.56	
<i>SE</i>	0.17	0.17	0.12	0.18	0.17	0.12	
<i>N</i>	47	47	94	43	47	90	
<hr/>							

Note. Exact wording of three items in composite: "I (like/dislike) binge drinking," "I feel (positive/negative) toward binge drinking," and "Binge drinking is (nice/awful)" all measured on 7-point Likert scales.

Covariates appearing in model are evaluated at the following values: Typical number of drinks consumed on occasions when going out drinking = 3.94, Typical number of drinks consumed on occasions when staying in drinking = 2.03, and Social desirability = 5.21.

Table 20 - Experiment 2: How Important the Decision is to Binge Drink as a Function of Schema Matching, Topic Matching, Values Matching, and Gender: Estimated Marginal Means and Standard Errors

Relationship of Webpage to Message							
<i>Message Personalization</i>	Topic Non-Matching			Topic Matching			<u>Total</u>
	Values Non-Matching	Values Matching	Total	Values Non-Matching	Values Matching	Total	
Schema Non-Matching							
Male							
Mean	4.05	4.42	4.24	3.54	3.98	3.76	4.00
SE	0.54	0.58	0.40	0.60	0.56	0.41	0.30
N	13	11	24	10	12	22	46
Female							
Mean	3.67	5.55	4.61	4.44	3.73	4.09	4.35
SE	0.58	0.56	0.41	0.55	0.55	0.39	0.28
N	11	12	23	12	12	24	47
Total							
Mean	3.86	4.98	4.42	3.99	3.86	3.92	4.17
SE	0.39	0.40	0.28	0.41	0.39	0.28	0.20
N	24	23	47	22	24	46	93
Schema Matching							
Male							
Mean	4.66	4.96	4.81	4.94	4.46	4.70	4.76
SE	0.58	0.57	0.40	0.64	0.58	0.43	0.29
N	11	12	23	9	11	20	43
Female							
Mean	4.69	5.73	5.21	4.92	3.85	4.38	4.80
SE	0.56	0.55	0.39	0.55	0.55	0.39	0.28
N	12	12	24	12	12	24	48
Total							

Mean	4.68	5.35	5.01	4.93	4.15	4.54	4.78
SE	0.40	0.39	0.28	0.42	0.40	0.29	0.20
N	23	24	47	21	23	44	91
<hr/>							
<i>TOTAL</i>							
<hr/>							
Male							
Mean	4.36	4.69	4.52	4.24	4.22	4.23	4.38
SE	0.39	0.41	0.29	0.44	0.40	0.30	0.21
N	24	23	47	19	23	42	89
Female							
Mean	4.18	5.64	4.91	4.68	3.79	4.24	4.57
SE	0.40	0.39	0.28	0.39	0.39	0.28	0.20
N	23	24	47	24	24	48	95
<i>Total</i>							
Mean	4.27	5.17	4.72	4.46	4.00	4.23	
SE	0.28	0.28	0.20	0.29	0.28	0.20	
N	47	47	94	43	47	90	

Note. Exact wording of item is "Decisions about your drinking behavior require (Little / A lot of) thought" measured on a 7-point Likert scale.

Covariates appearing in model are evaluated at the following values: Typical number of drinks consumed on occasions when going out drinking = 3.94, Typical number of drinks consumed on occasions when staying in drinking = 2.03, and Social desirability = 5.21.

Table 21 - Experiment 2: Belief that Binge Drinking is a Bad Behavior as a Function of Schema Matching, Topic Matching, Values Matching, and Gender: ANCOVA

Source	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	Partial η^2
<i>Typical # drinks when out</i>	<i>69.88</i>	<i>1</i>	<i>69.88</i>	<i>53.40***</i>	<i>.24</i>
<i>Typical # drinks when in</i>	<i>6.65</i>	<i>1</i>	<i>6.65</i>	<i>5.08*</i>	<i>.03</i>
<i>Social Desirability</i>	<i>2.76</i>	<i>1</i>	<i>2.76</i>	<i>2.11</i>	<i>.01</i>
Schema Matching (S)	0.03	1	0.03	0.02	.00
Topic Matching (T)	0.05	1	0.05	0.04	.00
Values Matching (V)	0.10	1	0.10	0.08	.00
Gender (G)	0.56	1	0.56	0.43	.00
S x T	0.75	1	0.75	0.57	.00
S x V	0.54	1	0.54	0.41	.00
T x V	1.80	1	1.80	1.37	.01
S x T x V	1.39	1	1.39	1.06	.01
S x G	0.83	1	0.83	0.63	.00
T x G	0.03	1	0.03	0.03	.00
S x T x G	0.88	1	0.88	0.67	.00
V x G	1.53	1	1.53	1.17	.01
S x V x G	2.98	1	2.98	2.27	.01
T x V x G	3.98	1	3.98	3.04	.02
S x T x V x G	1.17	1	1.17	0.89	.01
Error	215.93	165	1.31		
Total	6047.11	184			

Note. Exact wording of three items in composite: “I (like/dislike) binge drinking,” “I feel (positive/negative) toward binge drinking,” and “Binge drinking is (nice/awful)” all measured on 7-point Likert scales.

* $p < .05$; *** $p < .001$

Table 22 - Experiment 2: Belief about the Importance of the Decision to Binge Drink as a Function of Schema Matching, Topic Matching, Values Matching, and Gender: ANCOVA

Source	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	Partial η^2
<i>Typical # drinks when out</i>	4.39	1	4.39	1.23	.01
<i>Typical # drinks when in</i>	0.15	1	0.15	0.04	.00
<i>Social Desirability</i>	13.79	1	13.79	3.86	.02
Schema Matching (S)	15.91	1	15.91	4.45*	.03
Topic Matching (T)	10.62	1	10.62	2.97	.02
Values Matching (V)	2.19	1	2.19	0.61	.00
Gender (G)	1.54	1	1.54	0.43	.00
S x T	0.01	1	0.01	0.00	.00
S x V	3.38	1	3.38	0.95	.01
T x V	20.81	1	20.81	5.82*	.03
S x T x V	0.10	1	0.10	0.03	.00
S x G	1.05	1	1.05	0.29	.00
T x G	1.58	1	1.58	0.44	.00
S x T x G	1.23	1	1.23	0.34	.00
V x G	0.19	1	0.19	0.05	.00
S x V x G	0.04	1	0.04	0.01	.00
T x V x G	11.39	1	11.39	3.18	.02
S x T x V x G	1.23	1	1.23	0.34	.00
Error	590.22	165	3.58		
Total	4364.00	184			

Note. Exact wording of item is “Decisions about your drinking behavior require (Little / A lot of) thought” measured on a 7-point Likert scale.

* $p < .05$

Table 23 - Experiment 2: How Appropriate the Message Is as a Function of Schema Matching, Topic Matching, Values Matching, and Gender: Estimated Marginal Means and Standard Errors

Relationship of Webpage to Message							
	Topic Non-Matching			Topic Matching			
<i>Message</i>	Values	Values	Total	Values	Values	Total	<u>Total</u>
<i>Personalization</i>	Non-Matching	Matching		Non-Matching	Matching		
Schema							
Non-Matching							
Male							
Mean	3.72	3.86	3.79	4.68	4.41	4.55	4.17
SE	0.45	0.49	0.34	0.51	0.47	0.35	0.25
N	13	11	24	10	12	22	46
Female							
Mean	2.80	4.41	3.60	5.44	4.58	5.01	4.31
SE	0.49	0.47	0.34	0.46	0.46	0.33	0.24
N	11	12	23	12	12	24	47
Total							
Mean	3.26	4.13	3.70	5.06	4.49	4.78	4.24
SE	0.33	0.34	0.24	0.34	0.33	0.24	0.17
N	24	23	47	22	24	46	93
Schema							
Matching							
Male							
Mean	3.53	4.25	3.89	4.98	4.37	4.67	4.28
SE	0.49	0.48	0.34	0.54	0.49	0.37	0.25
N	11	12	23	9	11	20	43
Female							
Mean	3.52	3.62	3.57	4.85	4.56	4.70	4.14
SE	0.47	0.46	0.33	0.46	0.46	0.33	0.23
N	12	12	24	12	12	24	48
Total							

Mean	3.52	3.94	3.73	4.91	4.47	4.69	4.21
SE	0.34	0.33	0.23	0.35	0.33	0.24	0.17
N	23	24	47	21	23	44	91
<hr/>							
<i>TOTAL</i>							
<hr/>							
Male							
Mean	3.62	4.05	3.84	4.83	4.39	4.61	4.22
SE	0.33	0.34	0.24	0.37	0.34	0.25	0.18
N	24	23	47	19	23	42	89
Female							
Mean	3.16	4.02	3.59	5.14	4.57	4.86	4.22
SE	0.34	0.33	0.24	0.33	0.33	0.23	0.17
N	23	24	47	24	24	48	95
<i>Total</i>							
Mean	3.39	4.03	3.71	4.98	4.48	4.73	
SE	0.23	0.23	0.17	0.25	0.23	0.17	
N	47	47	94	43	47	90	
<hr/>							

Note. Exact wording of items in the index was “How appropriate is the message in the context of the website you viewed?” (1 = Very Inappropriate / 7 = Very Appropriate) and “How relevant was the message to the content of the website you viewed?” (1 = Very Irrelevant / 7 = Very Relevant).

Covariates appearing in model are evaluated at the following values: Typical number of drinks consumed on occasions when going out drinking = 3.94, Typical number of drinks consumed on occasions when staying in drinking = 2.03, and Social desirability = 5.21.

Table 24 - Experiment 2: How Interesting and Informative the Message Is as a Function of Schema Matching, Topic Matching, Values Matching, and Gender: Estimated Marginal Means and Standard Errors

Relationship of Webpage to Message							
<i>Message</i>	Topic Non-Matching			Topic Matching			<u>Total</u>
	Values Non-Matching	Values Matching	Total	Values Non-Matching	Values Matching	Total	
<i>Personalization</i>							
Schema							
Non-Matching							
Male							
Mean	3.05	3.36	3.20	2.85	3.08	2.96	3.08
SE	0.41	0.45	0.31	0.46	0.43	0.32	0.23
N	13	11	24	10	12	22	46
Female							
Mean	3.21	3.78	3.49	3.37	3.70	3.53	3.51
SE	0.44	0.43	0.31	0.42	0.42	0.30	0.22
N	11	12	23	12	12	24	47
<i>Total</i>							
Mean	3.13	3.57	3.35	3.11	3.39	3.25	3.30
SE	0.30	0.31	0.21	0.31	0.30	0.22	0.15
N	24	23	47	22	24	46	93
Schema							
Matching							
Male							
Mean	3.64	3.86	3.75	3.98	2.96	3.47	3.61
SE	0.44	0.44	0.31	0.49	0.44	0.33	0.22
N	11	12	23	9	11	20	43
Female							
Mean	3.09	3.19	3.14	4.12	3.48	3.80	3.47
SE	0.43	0.42	0.30	0.42	0.42	0.30	0.21
N	12	12	24	12	12	24	48
<i>Total</i>							
Mean	3.37	3.52	3.45	4.05	3.22	3.63	3.54

<i>SE</i>	<i>0.31</i>	<i>0.30</i>	<i>0.21</i>	<i>0.32</i>	<i>0.30</i>	<i>0.22</i>	<i>0.16</i>
<i>N</i>	<i>23</i>	<i>24</i>	<i>47</i>	<i>21</i>	<i>23</i>	<i>44</i>	<i>91</i>
<hr/>							
<i>TOTAL</i>							
<hr/>							
Male							
Mean	3.34	3.61	3.48	3.41	3.02	3.22	3.35
<i>SE</i>	<i>0.30</i>	<i>0.31</i>	<i>0.22</i>	<i>0.34</i>	<i>0.31</i>	<i>0.23</i>	<i>0.16</i>
<i>N</i>	<i>24</i>	<i>23</i>	<i>47</i>	<i>19</i>	<i>23</i>	<i>42</i>	<i>89</i>
Female							
Mean	3.15	3.48	3.32	3.74	3.59	3.67	3.49
<i>SE</i>	<i>0.31</i>	<i>0.30</i>	<i>0.22</i>	<i>0.30</i>	<i>0.30</i>	<i>0.21</i>	<i>0.16</i>
<i>N</i>	<i>23</i>	<i>24</i>	<i>47</i>	<i>24</i>	<i>24</i>	<i>48</i>	<i>95</i>
<i>Total</i>							
Mean	3.25	3.55	3.40	3.58	3.30	3.44	
<i>SE</i>	<i>0.21</i>	<i>0.21</i>	<i>0.15</i>	<i>0.22</i>	<i>0.21</i>	<i>0.15</i>	
<i>N</i>	<i>47</i>	<i>47</i>	<i>94</i>	<i>43</i>	<i>47</i>	<i>90</i>	
<hr/>							

Note. Exact wording of the three items in the index are “The message on the website about binge drinking was interesting,” “I learned something from the message,” and “I received new information from the message” all measured on 7-point Likert scales (1 = Disagree Strongly / 7 = Agree Strongly).

Covariates appearing in model are evaluated at the following values: Typical number of drinks consumed on occasions when going out drinking = 3.94, Typical number of drinks consumed on occasions when staying in drinking = 2.03, and Social desirability = 5.21.

Table 25 - Experiment 2: How Attractive the Message Is as a Function of Schema Matching, Topic Matching, Values Matching, and Gender: Estimated Marginal Means and Standard Errors

Relationship of Webpage to Message							
<i>Message</i>	Topic Non-Matching			Topic Matching			<u>Total</u>
	Values Non-Matching	Values Matching	Total	Values Non-Matching	Values Matching	Total	
<i>Personalization</i>							
Schema							
Non-Matching							
Male							
Mean	4.59	4.97	4.78	4.86	4.44	4.65	4.72
SE	0.32	0.35	0.24	0.36	0.33	0.25	0.18
N	13	11	24	10	12	22	46
Female							
Mean	4.94	5.65	5.29	5.59	4.71	5.15	5.22
SE	0.34	0.33	0.24	0.33	0.33	0.23	0.17
N	11	12	23	12	12	24	47
<i>Total</i>							
Mean	4.77	5.31	5.04	5.23	4.58	4.90	4.97
SE	0.23	0.24	0.17	0.24	0.23	0.17	0.12
N	24	23	47	22	24	46	93
Schema							
Matching							
Male							
Mean	4.46	4.60	4.53	4.46	4.45	4.46	4.49
SE	0.34	0.34	0.24	0.38	0.34	0.26	0.17
N	11	12	23	9	11	20	43
Female							
Mean	4.76	4.94	4.85	4.98	4.69	4.83	4.84
SE	0.33	0.33	0.23	0.33	0.33	0.23	0.17
N	12	12	24	12	12	24	48
<i>Total</i>							
Mean	4.61	4.77	4.69	4.72	4.57	4.64	4.67

<i>SE</i>	0.24	0.23	0.17	0.25	0.24	0.17	0.12
<i>N</i>	23	24	47	21	23	44	91
<hr/>							
<i>TOTAL</i>							
<hr/>							
Male							
Mean	4.53	4.79	4.66	4.66	4.45	4.55	4.60
<i>SE</i>	0.23	0.24	0.17	0.26	0.24	0.18	0.12
<i>N</i>	24	23	47	19	23	42	89
Female							
Mean	4.85	5.30	5.07	5.29	4.70	4.99	5.03
<i>SE</i>	0.24	0.23	0.17	0.23	0.23	0.16	0.12
<i>N</i>	23	24	47	24	24	48	95
<i>Total</i>							
Mean	4.69	5.04	4.86	4.97	4.57	4.77	
<i>SE</i>	0.17	0.16	0.12	0.17	0.16	0.12	
<i>N</i>	47	47	94	43	47	90	
<hr/>							

Note. Exact wording of three items in the composite: “I (dislike/like) the message,” “I react (unfavorably/favorably) to the message,” and “I feel (negatively/positively) to the message” all measured on 7-point Likert scales.

Covariates appearing in model are evaluated at the following values: Typical number of drinks consumed on occasions when going out drinking = 3.94, Typical number of drinks consumed on occasions when staying in drinking = 2.03, and Social desirability = 5.21.

Table 26 - Experiment 2: How Appropriate the Message Is in the Context as a Function of Schema Matching, Topic Matching, Values Matching, and Gender: ANCOVA

Source	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	Partial η^2
<i>Typical # drinks when out</i>	0.40	1	0.40	0.16	.00
<i>Typical # drinks when in</i>	0.11	1	0.11	0.04	.00
<i>Social Desirability</i>	1.73	1	1.73	0.68	.00
Schema Matching (S)	0.03	1	0.03	0.01	.00
Topic Matching (T)	47.11	1	47.11	18.59***	.10
Values Matching (V)	0.21	1	0.21	0.09	.00
Gender (G)	0.00	1	0.00	0.00	.00
S x T	0.17	1	0.17	0.07	.00
S x V	0.33	1	0.33	0.13	.00
T x V	14.94	1	14.94	5.90*	.03
S x T x V	0.92	1	0.92	0.36	.00
S x G	0.87	1	0.87	0.34	.00
T x G	2.75	1	2.75	1.09	.01
S x T x G	0.24	1	0.24	0.09	.00
V x G	0.25	1	0.25	0.10	.00
S x V x G	0.97	1	0.97	0.38	.00
T x V x G	0.89	1	0.89	0.35	.00
S x T x V x G	6.26	1	6.26	2.47	.02
Error	418.23	165	2.54		
Total	3767.75	184			

Note. Exact wording of items in the index was “How appropriate is the message in the context of the website you viewed?” (1 = Very Inappropriate / 7 = Very Appropriate) and “How relevant was the message to the content of the website you viewed?” (1 = Very Irrelevant / 7 = Very Relevant).

* $p < .05$; *** $p < .001$

Table 27 - Experiment 2: How Interesting and Informative the Message is as a Function of Schema Matching, Topic Matching, Values Matching, and Gender: ANCOVA

Source	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	Partial η^2
<i>Typical # drinks when out</i>	0.52	1	0.52	0.25	.00
<i>Typical # drinks when in</i>	3.59	1	3.59	1.71	.01
<i>Social Desirability</i>	0.53	1	0.53	0.25	.00
Schema Matching (S)	2.53	1	2.53	1.20	.01
Topic Matching (T)	0.09	1	0.09	0.04	.00
Values Matching (V)	0.01	1	0.01	0.00	.00
Gender (G)	0.83	1	0.83	0.40	.00
S × T	0.96	1	0.96	0.46	.00
S × V	5.59	1	5.59	2.66	.02
T × V	3.72	1	3.72	1.77	.01
S × T × V	1.84	1	1.84	0.87	.01
S × G	3.58	1	3.58	1.70	.01
T × G	4.09	1	4.09	1.95	.01
S × T × G	1.18	1	1.18	0.56	.00
V × G	0.27	1	0.27	0.13	.00
S × V × G	0.01	1	0.01	0.00	.00
T × V × G	0.08	1	0.08	0.04	.00
S × T × V × G	0.30	1	0.30	0.14	.00
Error	347.00	165	18.93		
Total	2524.89	184			

Note. Exact wording of the three items in the index are “The message on the website about binge drinking was interesting,” “I learned something from the message,” and “I received new information from the message” all measured on 7-point Likert scales (1 = Disagree Strongly / 7 = Agree Strongly).

Table 28 - Experiment 2: How Attractive the Message Is as a Function of Schema Matching, Topic Matching, Values Matching, and Gender: ANCOVA

Source	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	Partial η^2
<i>Typical # drinks when out</i>	3.77	1	3.77	2.98	.02
<i>Typical # drinks when in</i>	0.13	1	0.13	0.10	.00
<i>Social Desirability</i>	0.29	1	0.29	0.23	.00
Schema Matching (S)	4.00	1	4.00	3.16	.02
Topic Matching (T)	0.38	1	0.38	0.30	.00
Values Matching (V)	0.02	1	0.02	0.02	.00
Gender (G)	7.26	1	7.26	5.74*	.03
S x T	0.10	1	0.10	0.08	.00
S x V	0.04	1	0.04	0.03	.00
T x V	6.43	1	6.43	5.08*	.03
S x T x V	2.13	1	2.13	1.69	.01
S x G	0.28	1	0.28	0.22	.00
T x G	0.01	1	0.01	0.00	.00
S x T x G	0.01	1	0.01	0.01	.00
V x G	0.10	1	0.10	0.08	.00
S x V x G	0.01	1	0.01	0.01	.00
T x V x G	0.89	1	0.89	0.71	.00
S x T x V x G	0.15	1	0.15	0.12	.00
Error	208.58	165	1.26		
Total	4521.89	184			

Note. Exact wording of three items in the composite: “I (dislike/like) the message,” “I react (unfavorably/favorably) to the message,” and “I feel (negatively/positively) to the message” all measured on 7-point Likert scales.

* $p < .05$

Appendix A - Wording of Messages Used in Experiments

Experiment 1 Messages

Extraversion

You tend to be an outgoing, friendly person. Binge drinking may make you less friendly and approachable, or it may make you even more social, but in a bad way. It could push you over the top and make you loud and obnoxious, and less socially effective. You don't need alcohol to help you be social.

Introversion (Low Extraversion)

You tend to be relatively quiet and prefer the company of close friends. Having a drink or two may help you be social, but binge drinking may make it easier for others to break through your social boundaries or lead you to do something silly that people will be talking about the next day.

Conscientiousness

You tend to be reliable and organized. While having a couple of drinks shouldn't affect the care you take in your daily activities, binge drinking can get you in trouble by making you less able to focus on details and allowing you to let things fall through the cracks. Keep your life organized.

Unmotivated (Low Conscientiousness)

I'm sure you have had experiences where you have tended to be disorganized or easily distracted from a task, and this may get you in trouble from time to time. Binge drinking makes it even more impossible to stay on top of deadlines and responsibilities. Don't make problems worse.

Neuroticism

You sometimes tend to feel moody and anxious, and you worry about a lot of things. While having a couple of drinks may help to take the edge off and help you relax, binge drinking makes some people anxious and tends to contribute to serious problems that anyone would worry about. Avoid more serious worries.

Emotional Stability (Low Neuroticism)

You tend to be a calm and collected person. Having a couple of drinks won't affect that, but binge drinking lowers inhibitions, which may make you more moody and tense or lead to more serious problems that would worry anybody. Maintain your calm, collected life.

Agreeableness

You tend to be considerate, kind, and cooperative. Binge drinking can make you less likely to take other people's feelings into consideration and more likely to argue or start fights with others, which could permanently hurt your friendships. You value being kind and considerate to others.

Disagreeableness (Low Agreeableness)

You're a good person, but sometimes people do things that make you irritated or not trust them, so you prefer to keep an emotional distance. Binge drinking lowers inhibitions and makes it easier for people to take advantage of you. It also puts some people in a bad, irritable mood and may make it easier for people to get on your nerves. Don't let your guard down.

Openness

You tend to like new and creative activities and ideas. While a couple drinks may even contribute to your creative experiences, binge drinking can reduce coordination and mental acuity, thus limiting your capacity for enjoying new things. Keep your mind and body ready for new experiences. Don't binge drink.

Closedness (Low Openness)

You tend to prefer a normal routine without a lot of surprises. Binge drinking lowers inhibitions and leads a person to experiment with things that they normally would not. A couple of drinks shouldn't be a problem, but don't go too far and wake up tomorrow regretting things you tried. Don't binge drink.

Responsible Schema-matched

You value being a responsible, sensible and dependable person. One or two drinks should not interfere with your ability to be responsible and dependable; however, binge drinking will negatively impact these valued aspects of your life. It's sensible to drink responsibly because excessive alcohol interferes with a person's ability to fulfill obligations. Too much alcohol can distract a person and allow important details to slip through the cracks. Binge drinking also makes it less likely that the drinker will meet important deadlines, and take care of their responsibilities. Binge drinkers are less concerned with the welfare of others than non-drinkers. This makes it less likely that important others will be able to depend on the binge drinker in important situations. Binge drinking also lowers inhibitions, leading the person to make silly, senseless decisions that can have serious consequences. You want to make sensible decisions, and be responsible for yourself and those who depend on you. Be Responsible, Don't Binge Drink!

Communicative Schema-matched

You value being a warm, compassionate, and feeling person. One or two drinks should not interfere with the likelihood you will treat people in this way; however, binge drinking will negatively impact these valued aspects of your life. While a couple of drinks may make you feel even friendlier, too many drinks may make you friendly in a negative way. Too much alcohol may make you too touchy-feely with others, and it might make you more likely to share feelings you really wouldn't share otherwise. Drinking several alcoholic drinks temporarily changes who you are and how you act toward others. Excessive alcohol also interferes with one's ability to fulfill their unique potential, making this potential fade. Too much alcohol could also reduce your capacity to be warm with others and communicate your true

thoughts and feelings, hurting your relationships. Drinking responsibly will help you uphold your values. Be True To Yourself And Those You Love, Don't Binge Drink!

Curious Schema-matched

You value being a knowledgeable, wise, and curious person. One or two drinks should not interfere with your ability to understand complex concepts and solve difficult problems; however, binge drinking will negatively impact such valued aspects of your life. While a couple of drinks may loosen you up and help you think more imaginatively, too many drinks may seriously hurt your ability to be resourceful and innovative. Consuming excess alcohol kills brain cells (especially in those younger than 25), and it significantly reduces one's cognitive capacity. Binge drinking makes people less mentally capable and curious and hurts their chances of being ingenious, productive, or learning new skills. Drinking responsibly will help you hold on to the things you most value about yourself. It's important to be rational and in control of your mind. You need to keep your mind ready for the next challenge. Don't let too many drinks change your ability to think. Drink Smart, and Don't Binge Drink!

Adventuresome Schema-matched

You value being a competitive, skillful, spontaneous, and adventuresome person. One or two drinks should not interfere with your ability to show off your skills and win competitions; however, binge drinking will negatively impact such valued aspects of your life. While a couple of drinks might help you settle some nerves before attempting your next adventure, too many drinks may seriously hurt your ability to exhibit your true skills and you may lose your competitive edge. Too much alcohol may make you spontaneous in a bad way -attempting a dangerous stunt you normally wouldn't try. Alcohol is actually a depressant, and when too much is consumed, it dulls the senses and slows a person down, thereby making it impossible for them to act spontaneously. Binge drinking actually limits the amount of fun and excitement you can experience in a night. Drinking responsibly will help you hold on to your skills and competitive edge. Live the Exciting Life, Don't Binge Drink!

Non-Matched Control

Drinking to excess leads to many problems in a person's life. Different types of people experience different types of problems, but most people who drink to excess experience a variety of difficulties. Binge drinking leads to problems like missing class and getting behind in school work, unplanned sexual activity, unintentional injuries that require medical attention, arguments with friends, regrets over things you did while intoxicated, and worries associated with forgetting where you were or what you did. All of these problems can seriously interfere with a person's quality of life. For example, it can get them killed, in trouble with the police, kicked out of school, or it can damage important relationships. Drinking in moderation allows a person to carry on life normally, without the extra hassles that come from excessive drinking. People already have enough to think about in their life from school, work and family, you really don't need anything more like having these issues to think about, not to mention getting sick or hungover. Don't binge drink!

Experiment 2 Messages

These messages were previously published. Please refer to Pilling and Brannon (2007).

Appendix B - Pretesting Booklet

REDUCING UNHEALTHY BEHAVIORS

Next semester we are going to be doing a study concerning healthy drinking behaviors using the messages summarized on the following pages. Before using them in the study, we need to get people's judgments on the messages. There are no right and wrong answers to the following questions.

INSTRUCTIONS:

Look at the four personality color types¹² and the ten personality trait definitions on the previous two pages. Each personality type is identified by a color name on the top of the card (brown, blue, orange, and green). Looking back at the cards and the trait definitions, indicate which personality color type (brown, blue, orange, or green) OR which personality trait (Extraverted, Introverted, Neurotic, Emotionally Stable, Agreeable, Disagreeable, Conscientious, Unmotivated, Open, or Closed) describes the following messages. Some messages were written to represent a specific personality color type or trait, while others were written without any specific color type or trait in mind. Please answer the following questions and rate the degree to which a message represents each color and appeal where 1 = Not at all representative of a color type or trait and 7 = completely representative of a color type or trait. There are correct answers.

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Please note the colors represent the four schema categories. The colors served to facilitate categorization of schemas for the students. Brown represents the responsible schema, orange represents adventuresome schema, blue represents communicative schema, and green represents curious schema. In each page of the pretesting booklet, the schemas are indicated by these color categories.

Brown

I AM RESPONSIBLE • DEPENDABLE • HELPFUL • SENSIBLE



I NEED TO BE RESPONSIBLE. I WANT TO FULFILL MY DUTIES AND OBLIGATIONS. TO ORGANIZE AND STRUCTURE MY LIFE AS I SEE FIT. I AM PRACTICAL, SENSIBLE AND PUNCTUAL AND BELIEVE THAT PEOPLE SHOULD EARN THEIR WAY THROUGH WORK AND SERVICE TO OTHERS.

Orange

I AM ADVENTUROUS → SKILLFUL → COMPETITIVE → SPONTANEOUS



I NEED TO BE FREE TO ACT ON A MOMENT'S NOTICE, IMPULSIVELY AND SPONTANEOUSLY. I BELIEVE THAT LIFE IS TO ENJOY, SO I THRIVE ON FUN, VARIETY AND EXCITEMENT. I LIVE IN THE MOMENT. I ACT ON EVERY OPPORTUNITY.

Blue

I am warm ♥ communicative ♥ compassionate ♥ feeling ♥



I need to search for the meaning and significance of life. I want to find ways to make my life count and matter, to become my own authentic self. Integrity, harmony, and honesty are very important to me. I feel that I am highly idealistic and spiritual by nature.

Green

I am versatile • wise • conceptual • curious



I need freedom to pursue knowledge and wisdom, and to develop competency by acquiring skills and capabilities. I think life is something to make sense of, to be understood and explained.

Trait Definitions

Extraverted: talkative, full of energy, generates a lot of enthusiasm, has an assertive personality, outgoing, sociable

Introverted: reserved, tends to be quiet, sometimes shy and inhibited

Neurotic: is depressed and blue, can be tense, worries a lot, can be moody, gets nervous easily

Emotional Stable: is relaxed and handles stress well, is emotionally stable and is not easily upset, remains calm in tense situations

Agreeable: is helpful and unselfish with others, has a forgiving nature, is generally trusting, is considerate and kind to almost everyone, likes to cooperate with others

Disagreeable: tends to find fault with others, starts quarrels with others, can be cold and aloof, is sometimes rude to others

Conscientious: does a thorough job, is a reliable worker, tends to be organized, perseveres until a task is completed, does things efficiently, makes plans and follows through

Unmotivated: can be somewhat careless, tends to be lazy, is easily distracted

Open: is original and comes up with new ideas, is curious about many different things, is ingenious and a deep thinker, has an active imagination, is inventive, values artistic experiences, likes to reflect and play with ideas

Closed: prefers work that is routine, has few artistic interests, does not like to try new things and ideas

You value being a responsible, sensible and dependable person. One or two drinks should not interfere with your ability to be responsible and dependable; however, binge drinking will negatively impact these valued aspects of your life. It's sensible to drink responsibly because excessive alcohol interferes with a person's ability to fulfill obligations. Too much alcohol can distract a person and allow important details to slip through the cracks. Binge drinking also makes it less likely that the drinker will meet important deadlines, and take care of their responsibilities. Binge drinkers are less concerned with the welfare of others than non-drinkers. This makes it less likely that important others will be able to depend on the binge drinker in important situations. Binge drinking also lowers inhibitions, leading the person to make silly, senseless decisions that can have serious consequences. You want to make sensible decisions, and be responsible for yourself and those who depend on you. Be Responsible! Don't Binge Drink!

Looking back at the color types and trait definitions, to what extent was this message:

1	2	3	4	5	6	7
Not at all brown						Completely brown
1	2	3	4	5	6	7
Not at all blue						Completely blue
1	2	3	4	5	6	7
Not at all green						Completely green
1	2	3	4	5	6	7
Not at all orange						Completely orange
1	2	3	4	5	6	7
Not at all Extraverted						Completely Extraverted
1	2	3	4	5	6	7
Not at all Introverted						Completely Introverted
1	2	3	4	5	6	7
Not at all Neurotic						Completely Neurotic
1	2	3	4	5	6	7
Not at all Emotionally Stable						Completely Emotionally Stable
1	2	3	4	5	6	7
Not at all Agreeable						Completely Agreeable
1	2	3	4	5	6	7
Not at all Disagreeable						Completely Disagreeable
1	2	3	4	5	6	7
Not at all Conscientious						Completely Conscientious
1	2	3	4	5	6	7
Not at all Unmotivated						Completely Unmotivated
1	2	3	4	5	6	7
Not at all Open						Completely Open
1	2	3	4	5	6	7
Not at all Closed						Completely Closed

You value being a warm, compassionate, and feeling person. One or two drinks should not interfere with the likelihood you will treat people in this way; however, binge drinking will negatively impact these valued aspects of your life. While a couple of drinks may make you feel even friendlier, too many drinks may make you friendly in a negative way. Too much alcohol may make you too touchy-feely with others, and it might make you more likely to share feelings you really wouldn't share otherwise. Drinking several alcoholic drinks temporarily changes who you are and how you act toward others. Excessive alcohol also interferes with one's ability to fulfill their unique potential, making this potential fade. Too much alcohol could also reduce your capacity to be warm with others and communicate your true thoughts and feelings, hurting your relationships. Drinking responsibly will help you uphold your values. Be True To Yourself And Those You Love. Don't Binge Drink!

Looking back at the color types and trait definitions, to what extent was this message:

1	2	3	4	5	6	7
Not at all brown						Completely brown
1	2	3	4	5	6	7
Not at all blue						Completely blue
1	2	3	4	5	6	7
Not at all green						Completely green
1	2	3	4	5	6	7
Not at all orange						Completely orange
1	2	3	4	5	6	7
Not at all Extraverted						Completely Extraverted
1	2	3	4	5	6	7
Not at all Introverted						Completely Introverted
1	2	3	4	5	6	7
Not at all Neurotic						Completely Neurotic
1	2	3	4	5	6	7
Not at all Emotionally Stable						Completely Emotionally Stable
1	2	3	4	5	6	7
Not at all Agreeable						Completely Agreeable
1	2	3	4	5	6	7
Not at all Disagreeable						Completely Disagreeable
1	2	3	4	5	6	7
Not at all Conscientious						Completely Conscientious
1	2	3	4	5	6	7
Not at all Unmotivated						Completely Unmotivated
1	2	3	4	5	6	7
Not at all Open						Completely Open
1	2	3	4	5	6	7
Not at all Closed						Completely Closed

You value being a knowledgeable, wise, and curious person. One or two drinks should not interfere with your ability to understand complex concepts and solve difficult problems; however, binge drinking will negatively impact such valued aspects of your life. While a couple of drinks may loosen you up and help you think more imaginatively, too many drinks may seriously hurt your ability to be resourceful and innovative. Consuming excess alcohol kills brain cells (especially in those younger than 25), and it significantly reduces one's cognitive capacity. Binge drinking makes people less mentally capable and curious and hurts their chances of being ingenious, productive, or learning new skills. Drinking responsibly will help you hold on to the things you most value about yourself. It's important to be rational and in control of your mind. You need to keep your mind ready for the next challenge. Don't let too many drinks change your ability to think. Drink Smart, and Don't Binge Drink.

Looking back at the color types and trait definitions, to what extent was this message:

1	2	3	4	5	6	7
Not at all brown						Completely brown
1	2	3	4	5	6	7
Not at all blue						Completely blue
1	2	3	4	5	6	7
Not at all green						Completely green
1	2	3	4	5	6	7
Not at all orange						Completely orange
1	2	3	4	5	6	7
Not at all Extraverted						Completely Extraverted
1	2	3	4	5	6	7
Not at all Introverted						Completely Introverted
1	2	3	4	5	6	7
Not at all Neurotic						Completely Neurotic
1	2	3	4	5	6	7
Not at all Emotionally Stable						Completely Emotionally Stable
1	2	3	4	5	6	7
Not at all Agreeable						Completely Agreeable
1	2	3	4	5	6	7
Not at all Disagreeable						Completely Disagreeable
1	2	3	4	5	6	7
Not at all Conscientious						Completely Conscientious
1	2	3	4	5	6	7
Not at all Unmotivated						Completely Unmotivated
1	2	3	4	5	6	7
Not at all Open						Completely Open
1	2	3	4	5	6	7
Not at all Closed						Completely Closed

You value being a competitive, skillful, spontaneous, and adventuresome person. One or two drinks should not interfere with your ability to show off your skills and win competitions; however, binge drinking will negatively impact such valued aspects of your life. While a couple of drinks might help you settle some nerves before attempting your next adventure, too many drinks may seriously hurt your ability to exhibit your true skills and you may lose your competitive edge. Too much alcohol may make you spontaneous in a bad way -attempting a dangerous stunt you normally wouldn't try. Alcohol is actually a depressant, and when too much is consumed, it dulls the senses and slows a person down, thereby making it impossible for them to act spontaneously. Binge drinking actually limits the amount of fun and excitement you can experience in a night. Drinking responsibly will help you hold on to your skills and competitive edge. Live the Exciting Life, Don't Binge Drink!

Looking back at the color types and trait definitions, to what extent was this message:

1	2	3	4	5	6	7
Not at all brown						Completely brown
1	2	3	4	5	6	7
Not at all blue						Completely blue
1	2	3	4	5	6	7
Not at all green						Completely green
1	2	3	4	5	6	7
Not at all orange						Completely orange
1	2	3	4	5	6	7
Not at all Extraverted						Completely Extraverted
1	2	3	4	5	6	7
Not at all Introverted						Completely Introverted
1	2	3	4	5	6	7
Not at all Neurotic						Completely Neurotic
1	2	3	4	5	6	7
Not at all Emotionally Stable						Completely Emotionally Stable
1	2	3	4	5	6	7
Not at all Agreeable						Completely Agreeable
1	2	3	4	5	6	7
Not at all Disagreeable						Completely Disagreeable
1	2	3	4	5	6	7
Not at all Conscientious						Completely Conscientious
1	2	3	4	5	6	7
Not at all Unmotivated						Completely Unmotivated
1	2	3	4	5	6	7
Not at all Open						Completely Open
1	2	3	4	5	6	7
Not at all Closed						Completely Closed

Drinking to excess leads to many problems in a person's life. Different types of people experience different types of problems, but most people who drink to excess experience a variety of difficulties. Binge drinking leads to problems like missing class and getting behind in school work, unplanned sexual activity, unintentional injuries that require medical attention, arguments with friends, regrets over things you did while intoxicated, and worries associated with forgetting where you were or what you did. All of these problems can seriously interfere with a person's quality of life. For example, it can get them killed, in trouble with the police, kicked out of school, or it can damage important relationships. Drinking in moderation allows a person to carry on life normally, without the extra hassles that come from excessive drinking. People already have enough to think about in their life from school, work and family, you really don't need anything more like having these issues to think about, not to mention getting sick or hungover. Don't Binge Drink!

Looking back at the color types and trait definitions, to what extent was this message:

1	2	3	4	5	6	7
Not at all brown						Completely brown
1	2	3	4	5	6	7
Not at all blue						Completely blue
1	2	3	4	5	6	7
Not at all green						Completely green
1	2	3	4	5	6	7
Not at all orange						Completely orange
1	2	3	4	5	6	7
Not at all Extraverted						Completely Extraverted
1	2	3	4	5	6	7
Not at all Introverted						Completely Introverted
1	2	3	4	5	6	7
Not at all Neurotic						Completely Neurotic
1	2	3	4	5	6	7
Not at all Emotionally Stable						Completely Emotionally Stable
1	2	3	4	5	6	7
Not at all Agreeable						Completely Agreeable
1	2	3	4	5	6	7
Not at all Disagreeable						Completely Disagreeable
1	2	3	4	5	6	7
Not at all Conscientious						Completely Conscientious
1	2	3	4	5	6	7
Not at all Unmotivated						Completely Unmotivated
1	2	3	4	5	6	7
Not at all Open						Completely Open
1	2	3	4	5	6	7
Not at all Closed						Completely Closed

You tend to be an outgoing, friendly person. Binge drinking may make you less friendly and approachable, or it may make you even more social, but in a bad way. It could push you over the top and make you loud and obnoxious, and less socially effective. You don't need alcohol to help you be social.

Looking back at the color types and trait definitions, to what extent was this message:

1	2	3	4	5	6	7
Not at all brown						Completely brown
1	2	3	4	5	6	7
Not at all blue						Completely blue
1	2	3	4	5	6	7
Not at all green						Completely green
1	2	3	4	5	6	7
Not at all orange						Completely orange
1	2	3	4	5	6	7
Not at all Extraverted						Completely Extraverted
1	2	3	4	5	6	7
Not at all Introverted						Completely Introverted
1	2	3	4	5	6	7
Not at all Neurotic						Completely Neurotic
1	2	3	4	5	6	7
Not at all Emotionally Stable						Completely Emotionally Stable
1	2	3	4	5	6	7
Not at all Agreeable						Completely Agreeable
1	2	3	4	5	6	7
Not at all Disagreeable						Completely Disagreeable
1	2	3	4	5	6	7
Not at all Conscientious						Completely Conscientious
1	2	3	4	5	6	7
Not at all Unmotivated						Completely Unmotivated
1	2	3	4	5	6	7
Not at all Open						Completely Open
1	2	3	4	5	6	7
Not at all Closed						Completely Closed

You tend to be relatively quiet and prefer the company of close friends. Having a drink or two may help you be social, but binge drinking may make it easier for others to break through your social boundaries or lead you to do something silly that people will be talking about the next day.

Looking back at the color types and trait definitions, to what extent was this message:

1	2	3	4	5	6	7
Not at all brown						Completely brown
1	2	3	4	5	6	7
Not at all blue						Completely blue
1	2	3	4	5	6	7
Not at all green						Completely green
1	2	3	4	5	6	7
Not at all orange						Completely orange
1	2	3	4	5	6	7
Not at all Extraverted						Completely Extraverted
1	2	3	4	5	6	7
Not at all Introverted						Completely Introverted
1	2	3	4	5	6	7
Not at all Neurotic						Completely Neurotic
1	2	3	4	5	6	7
Not at all Emotionally Stable						Completely Emotionally Stable
1	2	3	4	5	6	7
Not at all Agreeable						Completely Agreeable
1	2	3	4	5	6	7
Not at all Disagreeable						Completely Disagreeable
1	2	3	4	5	6	7
Not at all Conscientious						Completely Conscientious
1	2	3	4	5	6	7
Not at all Unmotivated						Completely Unmotivated
1	2	3	4	5	6	7
Not at all Open						Completely Open
1	2	3	4	5	6	7
Not at all Closed						Completely Closed

You tend to be reliable and organized. While having a couple of drinks shouldn't affect the care you take in your daily activities, binge drinking can get you in trouble by making you less able to focus on details and allowing you to let things fall through the cracks. Keep your life organized.

Looking back at the color types and trait definitions, to what extent was this message:

1	2	3	4	5	6	7
Not at all brown						Completely brown
1	2	3	4	5	6	7
Not at all blue						Completely blue
1	2	3	4	5	6	7
Not at all green						Completely green
1	2	3	4	5	6	7
Not at all orange						Completely orange
1	2	3	4	5	6	7
Not at all Extraverted						Completely Extraverted
1	2	3	4	5	6	7
Not at all Introverted						Completely Introverted
1	2	3	4	5	6	7
Not at all Neurotic						Completely Neurotic
1	2	3	4	5	6	7
Not at all Emotionally Stable						Completely Emotionally Stable
1	2	3	4	5	6	7
Not at all Agreeable						Completely Agreeable
1	2	3	4	5	6	7
Not at all Disagreeable						Completely Disagreeable
1	2	3	4	5	6	7
Not at all Conscientious						Completely Conscientious
1	2	3	4	5	6	7
Not at all Unmotivated						Completely Unmotivated
1	2	3	4	5	6	7
Not at all Open						Completely Open
1	2	3	4	5	6	7
Not at all Closed						Completely Closed

I'm sure you have had experiences where you have tended to be disorganized or easily distracted from a task, and this may get you in trouble from time to time. Binge drinking makes it even more impossible to stay on top of deadlines and responsibilities. Don't make problems worse.

Looking back at the color types and trait definitions, to what extent was this message:

1	2	3	4	5	6	7
Not at all brown						Completely brown
1	2	3	4	5	6	7
Not at all blue						Completely blue
1	2	3	4	5	6	7
Not at all green						Completely green
1	2	3	4	5	6	7
Not at all orange						Completely orange
1	2	3	4	5	6	7
Not at all Extraverted						Completely Extraverted
1	2	3	4	5	6	7
Not at all Introverted						Completely Introverted
1	2	3	4	5	6	7
Not at all Neurotic						Completely Neurotic
1	2	3	4	5	6	7
Not at all Emotionally Stable						Completely Emotionally Stable
1	2	3	4	5	6	7
Not at all Agreeable						Completely Agreeable
1	2	3	4	5	6	7
Not at all Disagreeable						Completely Disagreeable
1	2	3	4	5	6	7
Not at all Conscientious						Completely Conscientious
1	2	3	4	5	6	7
Not at all Unmotivated						Completely Unmotivated
1	2	3	4	5	6	7
Not at all Open						Completely Open
1	2	3	4	5	6	7
Not at all Closed						Completely Closed

You sometimes tend to feel moody and anxious, and you worry about a lot of things. While having a couple of drinks may help to take the edge off and help you relax, binge drinking makes some people anxious and tends to contribute to serious problems that anyone would worry about. Avoid more serious worries.

Looking back at the color types and trait definitions, to what extent was this message:

1	2	3	4	5	6	7
Not at all brown						Completely brown
1	2	3	4	5	6	7
Not at all blue						Completely blue
1	2	3	4	5	6	7
Not at all green						Completely green
1	2	3	4	5	6	7
Not at all orange						Completely orange
1	2	3	4	5	6	7
Not at all Extraverted						Completely Extraverted
1	2	3	4	5	6	7
Not at all Introverted						Completely Introverted
1	2	3	4	5	6	7
Not at all Neurotic						Completely Neurotic
1	2	3	4	5	6	7
Not at all Emotionally Stable						Completely Emotionally Stable
1	2	3	4	5	6	7
Not at all Agreeable						Completely Agreeable
1	2	3	4	5	6	7
Not at all Disagreeable						Completely Disagreeable
1	2	3	4	5	6	7
Not at all Conscientious						Completely Conscientious
1	2	3	4	5	6	7
Not at all Unmotivated						Completely Unmotivated
1	2	3	4	5	6	7
Not at all Open						Completely Open
1	2	3	4	5	6	7
Not at all Closed						Completely Closed

You tend to be a calm and collected person. Having a couple of drinks won't affect that, but binge drinking lowers inhibitions, which may make you more moody and tense or lead to more serious problems that would worry anybody. Maintain your calm, collected life.

Looking back at the color types and trait definitions, to what extent was this message:

1	2	3	4	5	6	7
Not at all brown						Completely brown
1	2	3	4	5	6	7
Not at all blue						Completely blue
1	2	3	4	5	6	7
Not at all green						Completely green
1	2	3	4	5	6	7
Not at all orange						Completely orange
1	2	3	4	5	6	7
Not at all Extraverted						Completely Extraverted
1	2	3	4	5	6	7
Not at all Introverted						Completely Introverted
1	2	3	4	5	6	7
Not at all Neurotic						Completely Neurotic
1	2	3	4	5	6	7
Not at all Emotionally Stable						Completely Emotionally Stable
1	2	3	4	5	6	7
Not at all Agreeable						Completely Agreeable
1	2	3	4	5	6	7
Not at all Disagreeable						Completely Disagreeable
1	2	3	4	5	6	7
Not at all Conscientious						Completely Conscientious
1	2	3	4	5	6	7
Not at all Unmotivated						Completely Unmotivated
1	2	3	4	5	6	7
Not at all Open						Completely Open
1	2	3	4	5	6	7
Not at all Closed						Completely Closed

You tend to be considerate, kind, and cooperative. Binge drinking can make you less likely to take other people's feelings into consideration and more likely to argue or start fights with others, which could permanently hurt your friendships. You value being kind and considerate to others.

Looking back at the color types and trait definitions, to what extent was this message:

1	2	3	4	5	6	7
Not at all brown						Completely brown
1	2	3	4	5	6	7
Not at all blue						Completely blue
1	2	3	4	5	6	7
Not at all green						Completely green
1	2	3	4	5	6	7
Not at all orange						Completely orange
1	2	3	4	5	6	7
Not at all Extraverted						Completely Extraverted
1	2	3	4	5	6	7
Not at all Introverted						Completely Introverted
1	2	3	4	5	6	7
Not at all Neurotic						Completely Neurotic
1	2	3	4	5	6	7
Not at all Emotionally Stable						Completely Emotionally Stable
1	2	3	4	5	6	7
Not at all Agreeable						Completely Agreeable
1	2	3	4	5	6	7
Not at all Disagreeable						Completely Disagreeable
1	2	3	4	5	6	7
Not at all Conscientious						Completely Conscientious
1	2	3	4	5	6	7
Not at all Unmotivated						Completely Unmotivated
1	2	3	4	5	6	7
Not at all Open						Completely Open
1	2	3	4	5	6	7
Not at all Closed						Completely Closed

You're a good person, but sometimes people do things that make you irritated or not trust them, so you prefer to keep an emotional distance. Binge drinking lowers inhibitions and makes it easier for people to take advantage of you. It also puts some people in a bad, irritable mood and may make it easier for people to get on your nerves. Don't let your guard down.

Looking back at the color types and trait definitions, to what extent was this message:

1	2	3	4	5	6	7
Not at all brown						Completely brown
1	2	3	4	5	6	7
Not at all blue						Completely blue
1	2	3	4	5	6	7
Not at all green						Completely green
1	2	3	4	5	6	7
Not at all orange						Completely orange
1	2	3	4	5	6	7
Not at all Extraverted						Completely Extraverted
1	2	3	4	5	6	7
Not at all Introverted						Completely Introverted
1	2	3	4	5	6	7
Not at all Neurotic						Completely Neurotic
1	2	3	4	5	6	7
Not at all Emotionally Stable						Completely Emotionally Stable
1	2	3	4	5	6	7
Not at all Agreeable						Completely Agreeable
1	2	3	4	5	6	7
Not at all Disagreeable						Completely Disagreeable
1	2	3	4	5	6	7
Not at all Conscientious						Completely Conscientious
1	2	3	4	5	6	7
Not at all Unmotivated						Completely Unmotivated
1	2	3	4	5	6	7
Not at all Open						Completely Open
1	2	3	4	5	6	7
Not at all Closed						Completely Closed

You tend to like new and creative activities and ideas. While a couple drinks may even contribute to your creative experiences, binge drinking can reduce coordination and mental acuity, thus limiting your capacity for enjoying new things. Keep your mind and body ready for new experiences.

Looking back at the color types and trait definitions, to what extent was this message:

1	2	3	4	5	6	7
Not at all brown						Completely brown
1	2	3	4	5	6	7
Not at all blue						Completely blue
1	2	3	4	5	6	7
Not at all green						Completely green
1	2	3	4	5	6	7
Not at all orange						Completely orange
1	2	3	4	5	6	7
Not at all Extraverted						Completely Extraverted
1	2	3	4	5	6	7
Not at all Introverted						Completely Introverted
1	2	3	4	5	6	7
Not at all Neurotic						Completely Neurotic
1	2	3	4	5	6	7
Not at all Emotionally Stable						Completely Emotionally Stable
1	2	3	4	5	6	7
Not at all Agreeable						Completely Agreeable
1	2	3	4	5	6	7
Not at all Disagreeable						Completely Disagreeable
1	2	3	4	5	6	7
Not at all Conscientious						Completely Conscientious
1	2	3	4	5	6	7
Not at all Unmotivated						Completely Unmotivated
1	2	3	4	5	6	7
Not at all Open						Completely Open
1	2	3	4	5	6	7
Not at all Closed						Completely Closed

You tend to prefer a normal routine without a lot of surprises. Binge drinking lowers inhibitions and leads a person to experiment with things that they normally would not. A couple of drinks shouldn't be a problem, but don't go too far and wake up tomorrow regretting things you tried.

Looking back at the color types and trait definitions, to what extent was this message:

1	2	3	4	5	6	7
Not at all brown						Completely brown
1	2	3	4	5	6	7
Not at all blue						Completely blue
1	2	3	4	5	6	7
Not at all green						Completely green
1	2	3	4	5	6	7
Not at all orange						Completely orange
1	2	3	4	5	6	7
Not at all Extraverted						Completely Extraverted
1	2	3	4	5	6	7
Not at all Introverted						Completely Introverted
1	2	3	4	5	6	7
Not at all Neurotic						Completely Neurotic
1	2	3	4	5	6	7
Not at all Emotionally Stable						Completely Emotionally Stable
1	2	3	4	5	6	7
Not at all Agreeable						Completely Agreeable
1	2	3	4	5	6	7
Not at all Disagreeable						Completely Disagreeable
1	2	3	4	5	6	7
Not at all Conscientious						Completely Conscientious
1	2	3	4	5	6	7
Not at all Unmotivated						Completely Unmotivated
1	2	3	4	5	6	7
Not at all Open						Completely Open
1	2	3	4	5	6	7
Not at all Closed						Completely Closed

Appendix C - Sign-up Sheet

Name of Experiment: "Life in Manhattan" Website Evaluation

Number of Credits: 1

Room Location of Experiment: Meet in Psychology Waiting Area

Experimenter name: Valerie Pilling

Faculty Advisor: Laura Brannon

Description of Experiment: You will be asked to view a website on things to do for fun in Manhattan. You will be asked to fill out surveys about your thoughts about the website and your health-related behaviors (particularly eating and drinking behaviors, including your behavior relating to drinking alcohol).

Special Requirements (You must meet these conditions in order to participate): You must be at least 18 years old to participate.

Please read the following before signing up for this experiment: Your signature below acknowledges that you have read and understood the above description of the experiment, and that you agree to be in the experiment as it is described. You may, of course, withdraw at any time without penalty.

To sign up: If you want to participate, print your name, phone number and email address, instructor's name, and class time for general psychology in the space below. Please do not attempt to alter the dates or times for the experiment. Be sure to fill out the "Reminder Slip" and bring it with you when you report for the experiment.

Be sure to report a few minutes early for the experiment as researchers universally attempt to start on time.

DO NOT SIGN UP IF YOU HAVE PARTICIPATED IN THIS EXPERIMENT BEFORE.

Date and Time of Experiment	Your Name	Phone	Email	Gen Psych Instructor	Class Days & Time

Appendix D - Informed Consent

KANSAS STATE UNIVERSITY

INFORMED CONSENT

PROJECT TITLE: "Life in Manhattan" Website Evaluation

PRINCIPAL INVESTIGATOR: Dr. Laura Brannon

CONTACT PHONE NUMBER FOR ANY PROBLEMS/QUESTIONS: (785) 532-0604

IRB CHAIR CONTACT INFORMATION: Chair, Committee on Research Involving Human Subjects, 1 Fairchild Hall, Kansas State University, Manhattan, KS 66502, at (785) 532-3224

PURPOSE OF THE RESEARCH: This is a research study. We are interested in gaining a better understanding of how useful and interesting our website is to college students.

PROCEDURES OR METHODS TO BE USED: You will view a website and fill out some surveys about yourself (including behavior and attitudes relating to drinking alcohol, among other things) and about what you think about the website.

LENGTH OF STUDY: 1 hour

RISKS ANTICIPATED: None

BENEFITS ANTICIPATED: Participants can gain points that can be applied toward class credit. Participants will gain first-hand experience with psychological research.

EXTENT OF CONFIDENTIALITY: All information will remain completely confidential. Your responses will be identified with a code number so it will be impossible to identify you by your responses.

TERMS OF PARTICIPATION: I understand this is research and that my participation is completely voluntary. I also understand that if I decide to participate in this study, I may withdraw my consent at any time and stop participating at any time without explanation, penalty, or loss of benefits or academic standing to which I may otherwise be entitled.

I verify that my signature below indicates that I have read and understand this consent form, and I willingly agree to participate in this study under the terms described, and that my signature acknowledges that I have received a signed and dated copy of this consent form.

Participant Name:

Participant Signature:

Date:

Witness to Signature:

Date:

Appendix E - Big Five Inventory

The Big Five Inventory has been previously published. Please refer to John & Srivastava (1999) for items and scoring.

Appendix F - Activities and Interests Survey

Given that the website you will be viewing involves activities and services in town, we are interested in gaining a better understanding of your current interests and behaviors. Please indicate after the activity, in the space provided, how many times a week you engage in each behavior. You can use fractions or decimals if you want (for example if you do an activity once every 2 weeks, you can answer 0.5).

- Use the public library _____ times a week
- Go to the zoo _____ times a week
- Go to museums in town _____ times a week
- Go to the K-State Gardens _____ times a week
- Go dancing _____ times a week
- Go out drinking _____ times a week
 - How many drinks in one night _____
- Stay in and drink _____ times a week
 - How many drinks in one night _____
- Exercise _____ times a week
 - For how long _____ minutes
- Use Lafene Health Center _____ times a week
- Use the Health Education offices on campus _____ times a week
- Use the Nutritional Counseling service on campus _____ times a week
- Participate in a spiritual organization/activity (however you define it) _____
times a week

Appendix H - Intended Behavior Survey

You have been viewing a website and reading about several activities to do in Manhattan. You may not have been aware of some of these options before, so we would like to see if you are planning on doing any of these behaviors in the near future. Please indicate how many times you intend to engage in the following behaviors in the next week by placing a number in the space provided.

- Use the public library _____ times a week
- Go to the zoo _____ times a week
- Go to museums in town _____ times a week
- Go to the K-State Gardens _____ times a week
- Go dancing _____ times a week
- Go out drinking _____ times a week
 - How many drinks in one night _____
- Stay in and drink _____ times a week
 - How many drinks in one night _____
- Exercise _____ times a week
 - For how long _____ minutes
- Use Lafene Health Center _____ times a week
- Use the Health Education offices on campus _____ times a week
- Use the Nutritional Counseling service on campus _____ times a week
- Participate in a spiritual organization/activity (however you define it) _____ times a week

Appendix I - Attitude Survey

One thing that we are interested in is presenting students with public service announcements about some health–relevant behaviors. You just read a message relating to binge drinking. Here it is again: [The message they read is displayed here]. Please indicate the extent to which you agree with the following statements by circling a number on the 7-point scale.

The message on the website about binge drinking was interesting.

1	2	3	4	5	6	7
Disagree Strongly						Agree Strongly

I learned something from the message.

1	2	3	4	5	6	7
Disagree Strongly						Agree Strongly

I received new information from the message.

1	2	3	4	5	6	7
Disagree Strongly						Agree Strongly

I ____ the message.

1	2	3	4	5	6	7
Dislike						Like

I react ____ to the message.

1	2	3	4	5	6	7
Unfavorably						Favorably

I feel ____ to the message.

1	2	3	4	5	6	7
Negatively						Positively

How appropriate is the message in the context of the website you viewed?

1	2	3	4	5	6	7
Very Inappropriate						Very Appropriate

Appendix J - Drinking Beliefs Survey

We are also specifically interested in your personal beliefs about drinking alcohol. Please respond to the following statements on the 7-point scale.

I _____ binge drinking.

1	2	3	4	5	6	7
Like						Dislike

I feel _____ toward binge drinking.

1	2	3	4	5	6	7
Positive						Negative

Binge drinking is

1	2	3	4	5	6	7
Nice						Awful

Decisions about your drinking behavior require _____ thought.

1	2	3	4	5	6	7
Little						A Lot of

Appendix K - Social Desirability Scale

The 10-item Social Desirability Scale has been previously published. Please refer to Strahan & Gerbasi (1972).

Appendix M - Debriefing Statement

In this experiment, we were interested in how people interpret messages concerning health-relevant behaviors (in particular, drinking alcohol), depending upon their own personality. We predicted that individuals would respond best to the aspects of a message that best reflected their personality.

If you have any concerns about your own alcohol consumption, or that of someone you care about, please see me after the experiment and I will provide you with information about alcohol use and abuse programs on campus or in Manhattan.

If you have any further questions about this experiment, feel free to discuss them with me, or to contact Dr. Brannon at 532-0604 or email her at lbrannon@ksu.edu. Thank you for your participation.

Appendix N - Web Page Context Descriptions

Bars:

DRINKING

Nothing like chilling out with buddies over a drink. Aggieville has got some of the coolest bars in town.

Auntie Mae's Parlor

Originally opened in 1930 during Prohibition in the basement of Walters' Plumbing, but was reopened in 1974. Open everyday!

614 N. 12th

785-539-8508

Rusty's Next Door

Visit Kansas' first non-smoking bar! Open 4 p.m.-2 a.m. daily.

1215 Moro

785-587-1845

Rusty's Last Chance

Rusty's is well-known for its large outdoor patio on Aggieville's famous Moro Street. Hours: 11:30-2 a.m. everyday.

1213 Moro

785-776-6451

Fat's Bar & Grill

Come try a famous fishbowl at Fat's! Open everyday!

1209 Laramie

785-776-2424

The Salty Rim

Check out their amazing margarita selection! Open everyday!

1204 Moro

785-537-8910

Points of Interest:

Points of Interest in Manhattan

Founded in 1855 and with a population of 50,000, Manhattan, KS offers several points of interest in town.

Sunset Zoo

www.sunsetzoo.com

2333 Oak St

785-587-APES (2737)

Covering 52 acres, the Sunset Zoo offers exotic animals like Siberian tigers, chimpanzees, wallabies and a 50-year-old grizzly bear (possibly the oldest living grizzly bear in the world).

April – October open from 9:30am-5pm. November – March open 12-5pm. Open everyday.

Adults \$4, Children \$2, under 2-years old FREE.

Marianna Kistler Beach Museum of Art

www.k-state.edu/bma

701 Beach Lane, KSU Campus

785-532-7718

The Beach Museum of Art exhibits KSU's art collection, which includes about 6000 pieces of artwork highlighting the work of Kansas artists. Traveling art exhibits are displayed frequently as well. Open Tuesday-Friday 10am-5pm; Saturday-Sunday 1-5pm. FREE!

Kansas State University Gardens & Insect Zoo

1500 Denison Ave

785-532-2123

The Gardens present horticulture exhibits in various settings, and they include a conservatory built in 1907 that displays both tropical and arid plant life. The Gardens are open all year long from dawn until dusk. The Insect Zoo is open Monday-Friday 10am-4pm; Saturday 11am-2pm. FREE!

Pioneer Log Cabin

City Park

785-565-6490

The cabin was built in 1916 and displays farm equipment and items that were commonly found in pioneer homes. Open April-October, Sunday 2-5pm. FREE!

Goodnow House Museum

2309 Claflin Rd

785-565-6490

The museum is an historic house once owned by Isaac Goodnow, one of the founders of Manhattan, KSU, and the Kansas public school system. The museum displays memorabilia of the Goodnow family. Open Saturday-Sunday 2-5pm. FREE!

Health Organizations:

Health-Related Organizations

Ensure your health during the course of your college life. Become familiar with organizations that promote health and safety.

G.A.M.M.A (Greeks Advocating the Mature Management of Alcohol)

www.k-state.edu/gamma/

785-532-5546

This group meets monthly and traditionally sponsors a 5k fun run each year. They donate the money raised to the Safe Ride program, which offers KSU students complimentary rides home when they have been drinking on Thursday, Friday and Saturday nights.

MADD (Mothers Against Drunk Driving)

785-776-6686

This is an off-campus organization that promotes the use of designated drivers and offers underage drinking awareness programs to discourage drinking and driving.

Alcohol and Other Drug Education Office

www.k-state.edu/counseling/student/alcohol.htm

KSU Counseling Services

785-532-6927

This organization educates students on the physical and social risks associated with alcohol and drug use.

Lafene Health Center

www.k-state.edu/lafene/

785-532-6544

At Lafene, all doctor visits are free for students at K-State. It includes a pharmacy with cheaper prices than other pharmacies around town. Two online courses related to making a healthy and safe transition into college life are available through Lafene.

SNAC (Sensible Nutrition And body image Choices)

www.k-state.edu/lafene/SNAC/index.htm

snac@k-state.edu

This student group educates peers about healthy eating strategies and body image.

Spiritual Organizations:
Spiritual Organizations

No matter what a person's personal convictions, for those who are interested, there are a variety of opportunities to discuss spiritual issues for young people in Manhattan, and this list is just a small sample to show the wide variety of groups available on campus. There are also groups for those seeking religious alternatives. See K-State's website for a complete list of spiritual groups available on campus.

Campus Crusade for Christ

www.k-state.edu/cru/
Little Theater in Student Union
785-341-4071

St. Isidore's Catholic Center (Newman Club)

711 Denison
stisidores@stisidores.com
785-539-7496

Hillel-The Jewish Student Organization

www.k-state.edu/hillel/
785-532-6441

K-State Buddhist Association

ksuba@k-state.edu

Muslim Student Association

icm.msa@gmail.com
532-2480

AURA (Alliance for Understanding Religious Alternatives)

www.k-state.edu/aura/
contactaura@k-state.edu