

THE PERSUASIVE EFFECTS OF ANTI-BINGE DRINKING PSA ON COLLEGE
STUDENTS'S BINGE DRINKING: THE EFFECTIVENESS OF MESSENGER SOURCES,
MESSAGE APPEALS, AND THE INTERACTIONS

by

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(Under the Direction of Hye-Jin Paek and Spencer F. Tinkham)

ABSTRACT

This research investigates the influence of messenger sources and message appeals. The effects of interactions of messenger sources and appeals were found regarding (a) attitudes toward radio anti-binge drinking Public Service Announcements (PSAs); (b) attitudes toward binge drinking; and (c) intention to binge drink. The superiorities of matches between the sources and appeals were also examined using match-up hypotheses. College students (N=251) participated in a 2 x 2 (sources: medical expert vs. peer spokesperson x appeals: belief vs. evaluative) factorial design online experiment. Four transcribed radio PSAs were created and evaluated by MANCOVA with four covariates. The primary results were that there were conditional impacts of a similar source (peer) on creating favorable attitude towards the PSAs. Messages were more effective when there is consistency between sources and appeals (ex: expert/belief and peer/evaluative). The Fishbein's expectancy-value theory was used to assess attitudinal changes and discussed in its usefulness and application in health-related campaigns.

INDEX WORDS: Similarity, Expertise, Likelihood, Valance, Belief and Evaluative appeal, Binge drinking, Public Service Announcements, Match-up hypotheses, Fishbein, Expectancy-value model

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BBA., Hongik University, South Korea, 2006

A Thesis Submitted to the Graduate Faculty of The University of Georgia in Partial Fulfillment
of the Requirements for the Degree

MASTER OF ARTS

ATHENS, GEORGIA

2008

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August 2008

DEDICATION

I dedicate my thesis to the Lord Jesus Christ. I intend to dedicate my entire life to praise Him as well.

ACKNOWLEDGEMENTS

During two academic years in the United States, I have had unexpected difficulties. However, those troubles were gradually transformed into new opportunities through the guidance of invaluable people who have served as stepping stones for me.

I would especially like to thank Dr. Hye-Jin Paek for being my academic advisor and “life-guide”. Her caring and supportive encouragement was essential to the final outcome of my thesis. She was the one who understood the intangible concepts of my thesis and helped me articulate the ideas. She gave great, positive directions whenever I was lost. Through her clear suggestions, I was not only able to get over my frustrations, but I was also finally able to taste the joys of research.

I would also like to express my true appreciation to Dr. Spencer Tinkham. One of his teaching areas is “persuasion” and I now realize he embodies “persuasion” itself. The way he interacts with students, considers his academic research, and cares about other people, makes me want to emulate him. Without his insightful suggestions, invaluable advice and genuine concern from the very beginning to the end, I wouldn’t have been able to make the next step forward in my life. I hope he remembers me fondly as his student since I will remember him as a wonderful mentor.

I also would like to thank Dr. Karen W. King, who gave me simple and powerful advice on many fronts. A word from her was like a powerful sound bite containing the core essence of a concept. Her warm smile also provided motivation for me to keep going. (She taught me the true

value of a smile.)

Thanks also to Dr. Wendy Macias who helped and supported me silently. From small favors to big deeds, she encouraged me to keep studying in the USA while becoming accustomed to a foreign country. I give her the credit for the completion of my thesis.

There are so many more people to whom I wish to express my appreciation. One person is Dr. Jooyoung Kim, who bailed out me of trouble many times. He furnished a broad perspective, of how to handle a number life's complications. Both Dr. Yong ju Choi, and Dr. Kyung seok Shim at Hongik University were also big sponsors who cheered me up with words of encouragement. Shang Hyun Park, my former professor and supervisor, is someone I also would like to acknowledge for his continuing concerns and caring. Also, I was lucky to meet my mentors, Pastors Daniel, Park, Youngman Son, my brothers Daesung Hwangbo, Dongsik Yang, Jay Yu and Dr. Oljenik,

Finally, I would like to give my love and gratitude to my parents, Seung Kwon Ahn, and Jung Sook Won along with my sisters and brother-in-law (Yerim as well). I would like to thank many friends of mine for all their sincere prayers.

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CHAPTER I

Introduction

Social problems

Among American college students, there has been an increase in binge drinking since the early 1980s (Johnsson, Leifman, & Berglund, 2008; National Center on Addiction and Substance Abuse, 2007), creating concern in the field of public health about significant health and safety risks to which college students are exposed (Duran & Sulaiman, 2007; Ham & Hope 2003; Haward, 2002; Johnston, O'Malley & Bachman, 1995). The National Institute on Alcohol Abuse and Alcoholism (2004) defines binge drinking as “the consumption of 5 or more drinks in a row for men (4 or more drinks for women) on at least 1 occasion during the past 2 weeks.” In a study conducted in 1999, Harvard University’s School of Public Health College researched the drinking activities of full-time undergraduate students at 119 American colleges and universities. The study found that American college students engage in binge drinking in high numbers. Specifically, 51% of college males are liable to drink five or more drinks in a row and 40% of college females tend to drink four or more drinks one after the other. Although the legal drinking age in the United States is 21, the study found that the percentage of binge drinkers on American campuses tends to be similar across differing ages. Additionally, students who do binge drink have a tendency to do so frequently, meaning they binge drink three or more times in a two-week span. Abstaining from alcohol was only recorded in one in five students.

A variety of negative consequences of binge drinking have been recognized by researchers and public health officials. Students who binge drink regularly are more likely to acquire absences in class, obtain lower grades, injure themselves, and harm property (Wechsler, Dowdall, Maenner, Gledhill-Hoyt, & Lee, 1998). According to the National Institute on Alcohol Abuse and Alcoholism (1995), binge drinking while in college may be related to mental health and behavioral disorders involving compulsiveness, depression, or anxiety. Remarkably, a recent study found that 91% of women and 78% of men characterized as frequent binge drinkers viewed themselves to be moderate or light drinkers (Lyll, 1995).

Two sides of anti-binge drinking PSA

More recently, health campaigns have indulged in efforts to minimize the increasing amount of binge drinking in college students using a variety of media, including posters, flyers, email messages, and advertisements in college newspapers (DeJong, 2002). Hoping to influence drinking behavior, mass media health promotion campaigns are also frequently used in educating the public about harmful effects of drinking (Hill, 2004). Information campaigns, social marketing campaigns, and advocacy campaigns are the three most common approaches that the mass media campaigns employ to focus on binge drinking and related issues (Dejong, 2002). Included in these media health campaigns, public service announcements (PSAs) are often popularized in health campaigns funded by the government, seeking to reduce binge drinking rates (Dejong, 2002). As a form of social marketing campaigns (Moore, 2004), the main purpose of PSAs is to provide information or influence behavioral responses in certain audiences through a nonprofit commercial approach (Rice & Atkin, 1989; Rogers & Storey, 1987). With a successful rate of communicating to and influencing a large target population, PSAs are

advantageous when encouraging pro-social behavior using high credible sources such as spokespersons (Hornik, 1989). Some research indicates that consumer attitudes and behaviors regarding health risks and related issues are influenced by health communications in advertising PSAs (Rucker & Petty, 2006). For example, Truth, an anti-tobacco campaign that is youth-oriented, verified an optimistic correlation in that there were reductions in youths' and young adults' smoking habits (Thrasher, Niderdeppe, Farrelly, Davis, Ribisl, & Haviland, 2004).

Nevertheless, the consistency of health campaign effectiveness has sparked much debate about whether and how useful they can be in influencing attitude and behavior (Snyder, 2001). Such examples that question mass media campaign effectiveness include those focused on alcohol and other drugs; such campaigns can increase knowledge and awareness, but appear to have unsubstantial impact on actual behavior (Hill, 2004). Also, the World Health Organization recently sponsored research on alcohol policy, finding a lack of effectiveness in persuasion strategies targeting individual behavior (Babor, Caetano, Casswell et al., 2003). Likewise, another study reported that school-based or community-based promotions that are aimed at specific groups of teenagers could produce some improvements, but these changes were transitory, usually just delaying the increases in drinking that usually take place throughout adolescence (Foxcroft, Ireland, Lister-Sharp, Lowe, & Breen, 2003; Midford & McBride, 2001). Generally speaking, mass-media alcohol health promotion campaigns (PSAs) targeting a variety of audiences, including youths, have little to no effect on the target group (Hill, 2004).

The focus of the current study

Differing from other media types such as news and entertainment, the messages of public service campaigns strive to achieve changes in the knowledge, attitudes, and behavior of the

target group (Atkin & Freimuth, 2001). Multiple studies on mass media conclude, however, that it is relatively difficult to achieve these changes (Atkin, 2001). In order to make PSAs more successful, there are some general suggestions: (a) having a clear and practical object; (b) being designed for a specific focus audience; (c) having an appropriate type of appeal; (d) appropriate messenger (or spokesperson); (e) credibility; (f) understandability; (g) relevance; (h) high-quality mechanical construction; (i) high-quality creative execution; (j) being distributed using channels and vehicles that are related for the focus audience; (k) and being distributed in substantial quantity/with substantial frequency to ensure adequate message exposure (Dejong, 2002, p. 183).

Of particular importance in this study is analyzing the particular messenger delivering the health messages to the target audience. Specifically, the current study is within the context of PSAs which are designed to foster persuasion or resistance to binge drinking among college students. From a messenger-source standpoint, a series of studies have examined the relative effectiveness of the messenger sources on audiences' behavior and attitudinal change. For example, according to Atkin (1994), particular types of messengers (expert, peer, celebrity, etc.) have been adopted into a variety of health campaigns. However, he argued that none has been necessarily superior to the other in all situations (Atkin, 1994, p. 102). Besides, some researchers (e.g., Moore, 2004) have pointed out that the effectiveness of a PSA or other health campaigns tend to rest on two factors: one, whether the messengers are familiar with the topic in the PSA and, two, whether the audience perceives the familiarity.

Subsequently, it is reasonable to choose an appropriate messenger for use in a PSA based on the perspective of the target audience. In this study, the target audience of PSAs is American college students. To date, there is a paucity of theory and research that has demonstrated either

the relative effectiveness of PSA messengers (in this study, expert versus peer), or the reasons for that relative effectiveness, toward college students.

In addition to the use of effective messenger sources, researchers and health practitioners have disputed that the intended influence on the audience strongly relies on using appropriate message appeals (Atkin & Freimuth 1989; Flora & Thoreson, 1988; Fishbein & Ajzen, 1981). In other words, how the messengers advocate the messages is of importance. Research has suggested that the message appeals and content must also relate to the desired health behavior and attributes or consequences, highlighting positive incentives or negative incentives of unhealthy behavior (Atkin, 1994, p. 103). Interestingly, it would be possible that just using conventional fear appeals in health campaigns provides little long-term influence; thus, including new appeals may be expected to strengthen the message argument (Atkin, 2001).

Overall, along with knowing who the audience is, *who says* and *how tells* in the PSA are the key components of creating a persuasive health message in an effort to make the PSA effective. For that reason, the roles of both messenger source and message appeal should be examined in terms of the goal of the PSA, that is, the attitudinal and behavior change of the targets. In exploring the questions of constructing an effective PSA, this study will be limited to consideration of the two PSA message elements: messengers (*who says*) and message appeals (*how tells*).

Research Purpose

The purpose of the present study is to explore the effectiveness of anti-binge drinking PSA targeting American college students by investigating the messenger source and message appeal, as components of persuasive communication, and their impacts on (a) exhibiting

favorable attitudes toward the anti-binge drinking PSA, (b) unfavorable attitudes toward binge drinking, and (c) less intention of engaging in binge drinking. Simply put, this study explores the effectiveness of PSA on a specific binge-drinking preventative practice by focusing on appropriate messenger sources (expert vs. peer) and appropriate message appeals (belief appeal vs. evaluative appeal). In addition, this study attempts to examine the interactions between the types of sources and message appeals in terms of the persuasiveness of PSAs. The theoretical framework, used to analyze the attitudinal and behavioral responses to the hypothetical PSA' sources and messages, utilized both the match-up hypothesis (Kamins, 1994) and the Fishbein Attitude model (Fishbein & Ajzen, 1975).

Significance of the Study

The study is significant for three reasons. First, the present study attempts to examine certain types of messengers (expert vs. peer) as a means to explain the possible superiority of messenger sources in a context of anti-binge drinking PSA targeted to college students. Also, based on the past conventional fear-arousing message content, unconventional appeals (belief vs. evaluative appeals) are assessed in terms of their impacts on the college students' attitudinal and behavioral changes toward binge drinking. As a trial to increase the effectiveness of health campaigns (PSAs), the messenger sources and message appeals are examined to determine how well they could be tailored to the predispositions and abilities of the distinct groups, college students.

While college students have a rising and higher rate of binge drinking, (Johnsson, Leifman, & Berglund, 2008; National Center on Addiction and Substance Abuse, 2007) determining how practitioners can enhance the effectiveness of PSA was secondly significant. By

exploring the relatively less studied interaction effects with persuasion variables such as sources and messages, the present study is expected to provide useful implications for PSA practitioners in respect to peer-based interventions in the development of PSA.

Finally, as Lynn (1974, p. 623) notes “We know little, if anything, about behavioral or attitudinal responses to PSA message content or appeal.” This study is significant to scrutinize the effectiveness of PSA in terms of two different dimensions of attitudinal change. Specifically, this study is meaningful in its attempt to use the unconventional, diagnostic dimensions of Fishbein’s Attitude model in a public health area along with the global attitude model.

CHAPTER II

LITERATURE REVIEW

Messenger Source

Source Credibility

On occasion, whether an audience accepts a message positively or negatively hinge on the characteristic of the spokesperson. The attributes of the spokesperson used in messages play a role in how messages are evaluated (Haas, 1981; Friedman & Friedman 1979; Phillips & Dholakia 1978). Literature relates these characteristics with the viewers' ideas, suggesting the importance of perceived credibility of the spokesperson (Perse, Nathanson, & McLeod, 1996). Hovland and his associates (1953) used the term "source credibility," describing how the positive attributes of a communicator have an effect on the receiver's acceptance of a message.

The dimensions of Source Credibility

There are a variety of classifications of dimensions of source credibility in that both (a) the scales representing dynamics of source credibility and (b) the number of significant factors and their ensuing amount of variance changed over time (Applebaum & Anatol, 1973, p. 233). The common and straightforward dimensions of source credibility are comprised of expertise and trustworthiness (Pornpitakpan, 2004). According to Ohanian (1991), perceived expertise and the trustworthiness of the communicator (or endorser) are important aspects of credibility when trying to persuade and change attitudes. Expertise is defined as the considerable degree to which

a communicator is perceived to be capable to make accurate statements, and trustworthiness is related to a certain extent the audience sees the assertion made by a communicator to be valid (Hovland, Janis, & Kelly, 1953). Though they are not the only factors, many studies have focused on these two distinct dimensions of source credibility in relation to their effects in persuasion.

When analyzing celebrity speaker credibility, much literature has mentioned three dimensions: expertise, trustworthiness, and attractiveness (Ohanian, 1990). Attractiveness relies on how affable or bodily attractive the celebrity, in this case, is to the audience (Ohanian, 1991). The component of attractiveness has been regarded as a high link with the perceived similarity of the communicators. Several studies have indicated that celebrities who are more similar to their viewers retain more credibility than those that are dissimilar, resulting in persuasion effect (Bettinghaus, 1968; Berscheid 1966; Brock 1965). This role of perceived similarity has been the focus of some television effects research (e.g., Ward & Rivadeneyra, 1999) that concluded that "individuals who judge the television they watch as more realistic are more likely to be influenced by that content" (Busselle & Greenberg, 2000, p. 251). Often using testimonials relying demographically on similar sources, mass media try to indirectly reach out to audiences to generate a persuasion (Klapper, 1960; Katz 1957; Katz & Lazarsfeld 1955).

There are additional dimensions of source credibility in the literature. For example, three alternative dimensions pertaining to source credibility were proposed by Berlo, Lemert, and Mertz (1969): competence, trustworthiness, and dynamism. The two components of authoritativeness and character were also suggested by McCroskey (1966).

The persuasiveness of Source Credibility

For decades, researchers have attempted to discover the relative impact between high or low source on altering beliefs, attitudes, or behaviors (Pornpitakpan, 2004). In general, highly credible source produces more persuasive effect on measures of attitude and behavior change (Pornpitakpan, 2004; Schulman & Worrall 1970; Hovland & Weiss, 1951). Interestingly, different dimensions of source credibility have resulted in weighing differently on persuasion (Pornpitakpan, 2004). For example, the studies performed by McGinnies and Ward (1980) revealed that, regardless of the communicators' expertise, the audience responded more positively to the trustworthy communicator than to the untrustworthy one. Other studies argue, however, that trustworthiness alone may not be enough to create a persuasion on audience, going on to say that trustworthiness may be less important than expertise (Kelman & Hovland, 1953).

The Source Credibility in health campaigns

In public health campaigns, the messenger often represents the model that appears to relay the message, deliver information, demonstrate behavior, or provide a testimonial (Atkin, 2001, p. 64). Typically, health messengers play a role of enhancing credibility via incentive messages in health campaigns (Atkin, 2001). The source credibility, or messenger credibility, mainly discussed in health fields is dimensionally analogous to the source credibility discussed within an advertising perspective, in that it exhibits the following traits: expertise, trustworthiness, familiarity, likeability, and similarity to the target audience. Atkin (1994) viewed expertise and trustworthiness as the key components of messenger credibility, while the extent to whether messengers and audience have a similarity is considered a persuasive message.

Source similarity refers to the extent to which individuals consider themselves similar to

the spokesperson, based on certain attributes (Brown & Reingen 1987). In addition, Salmon and Atkin (2003, p.460) based their definition of similarity mainly on, “demographic individualities, expression of attitudinally shared ideas, and portrayal of common experiences.” From this standpoint, peer models are often considered important to young people and minorities; these particular audiences are not likely to react to conventional sources because they do not see them as similar. In other words, messages conveyed by a physician, who is considered an authority, might cause young people and minorities to avoid the message altogether because they consider the messages to be boring and to contain complicated information to which they do not relate (Salmon & Atkin, 2003).

There are a number of theories that postulate why perceived source similarity might raise the power of the information conveyed. First, the source-attractiveness model argues that the audience more easily identifies with sources that they perceive as being similar to themselves (Kelman, 1961). The theory of social comparison (Festingers, 1954) suggests that there is a frequent and growing tendency for people to evaluate others’ attitudes and capabilities against their own. Festinger (1954) pointed out that the main reason for the occurrence of this tendency is attributed to assumptions made by the target group; similar people have comparable requirements and predilections. Finally, the match-up hypothesis (Kamins, 1990, p 10) advocates that the influence of information relies on the consistency of a communicator’s image with a product representation and a self-concept of the receiver of the information. Typically, in advertising research fields, the influence of information in the source similarity has been studied (Wangenheim & Bayon, 2002). Research has proven that people are more influenced by similar spokespersons than those that are unlike (Feick & Higie, 1992). Also, in health-related studies, some empirical studies revealed that even if famous people, leaders in religion, and politics are

influential, in general, peer models are viewed as more persuasive than others in terms of younger viewers (Salmon & Atkin, 2003). In the study of HIV risk reduction interventions for African Americans, the peer as a health messenger has been found credible and persuasive (Myrick, 1998; Jemmott, 1996; Jemmott, Jemmott & Fong, 1998). Also, according to a study by North Illinois University (1999), peer models were useful sources for creating attention in a binge drinking campaign.

As previously mentioned, expertise is referred to as the considerable degree to which a communicator is perceived to be capable to make accurate statements, and trustworthiness is related to the extent to which the audience sees the assertion made by a communicator to be valid (Hovland, Janis, & Kelly, 1953). In the context of advertising highly related to selling products, expertise often refers to the “ability to perform product related tasks successfully” (Feick & Higie 1992, p.12). Many studies have proved that people are more prone to accept an expert’s message than a non-expert source (Bone 1995, Feick and Higie 1992, and Herr, Kardes and Kim 1991). According to Salmon and Atkin (2003), experts in health-related areas heighten *response efficacy*, defined as the audience's belief as to whether the recommendation presented in the message is effective in preventing or eliminating the threat (Tay, Watson, Radbourne, & De Young, 2001. p. 2). Thus, people tend to follow experts’ decisions because they are viewed to be of a higher level of qualification on a particular subject (Gilly et al. 1998).

Research Question (Expertise vs. Similarity)

For the most part, a number of critical debates about source credibility have tended to center around the question as to whether a credible source would be effective or not. Also, there seem to various operational explanations of source credibility, which might lead to inconsistent

results of the effects on specific dimensions on persuasion (Perse, Nathanson, & McLeod, 1996).

The first purpose of this study was to examine two different dimensions of messenger sources in terms of “*who says*”. Of particular importance in this regard is that health researchers still do not agree on which messenger source, an expert or a peer, may be more effective in public health campaigns. Returning to the special interest in the present study of PSA targeted at college students, the expert as a messenger is likely to be regarded by college students (the target audience of the PSA) as having expertise about the negative outcomes of binge drinking; thus, if this is the case, the PSA will be more persuasive than a PSA that uses a peer model who is not perceived as having expertise on the negative outcomes of binge drinking.

On the other hand, the peer model as a messenger seems to share the value of similarities with the college students in terms of binge drinking experiences. Atkin (1994) argued that the messengers that share similarities with the audience tend to increase the likelihood of accepting the message claims. Even if the peer messenger is perceived as lacking in expertise in regards to *response efficacy* of heavy drinking in the PSA, the messenger would be viewed as a specially-experienced person who actually knows the negative feelings possible after binge drinking, showing a similarity with the audience.

The eminent role of source credibility (expert-expertise vs. peer-similarity) could be expected in positive effects on persuasion, but the relative effects in different situations are ambiguous. According to Atkin, “health campaigners may conventionally favor certain types of messengers, but none alone is essentially superior to the other in all situations” (Atkin, 1994, p. 102).. Summing up, taking the ambiguous context of the comparable effectiveness between expertise and similarity into consideration, the first research question was asked.

RQ1: When the participants are exposed to messenger sources having either expertise or similarity, does the effectiveness of messengers (expert versus peer) differ on the dependent variables? : (a) exhibiting favorable attitudes toward the anti-binge drinking PSA, (b) unfavorable attitudes toward binge drinking, and (c) less intention of engaging in binge drinking.

Message Appeals in Health Domains

The rationale for using physical and social threats as fear-arousing message

(Negative incentive appeal)

Before introducing the second research question, it was worth taking a quick look at why the use of fear-arousing message content in this study is meaningful. Generally, one of the convincing tactics in public health campaigns involves intimidating people with the negative consequences that result from commencing or persisting in an unhealthy practice (Atkin, 2001). In terms of a threatening message in health campaigns, reaction to the message depends greatly on the message's general tone or appeal (Pallak, Murrone, & Koch, 1983; Petty, Cacioppo, & Schumann, 1983). An appeal refers to "the basic motivational or persuasive technique used in advertising" (Leiss, Kline, & Jhally, 1986, p.220). Instead of merely urging individuals to act a certain way, message content should connect the unhealthy activities with harmful incentives or the content should relate recommendable health behavior with desirable outcomes that provide encouraging incentives (Atkin, 2001).

Defined by Atkin (2001, p. 60), the fundamental dimensions of incentives, include “physical health, time/effort, economic, psychological/aspirational, and social”. Further, Atkin classifies these incentives into two appeals: negative appeals and positive appeals. While negative appeals use messages that instill a threat or fear, positive appeals create a reflective positive outcome to encourage the audience members perform to healthier alternatives (Atkin, 2001). Atkin (2001) argued that between the two, negative incentive appeals representing harmful and unhealthy consequences of physical health such as death, disease, and bodily wounds are the commonly used elements in the health realm. In connection with this issue, the study purported to use the negative incentive appeals, commonly having fear arousing messages, whose message content contains both physical and social threats.

The fear-arousing factors in health messages

Numerous studies on the persuasiveness of PSA that use fear messages have yielded mixed results (Stephenson & Witte, 2001; Dillard, 1994). For example, applying fear arousing messages to anti-smoking PSAs has little effect on youths because they feel unrelated to the message; it turns out that the long-term consequences of smoking are not strong indicators of the behavior of youths (Conrad, Flay, & Hill 1992; Collins, Sussman, & Rauch, 1987). Also, some researchers have pointed out that fear factors in health campaigns are infrequently successful and suggest that they be applied under partial conditions (Jon, 1988). Dejong and Winsten (1988) supported this view in that fear factors might boomerang in some cases, resulting in more resistance to change regarding the undesired behavior (Dejong & Winsten, 1988).

In contrast, other studies suggest that employing fear aspects may be an indispensable attribute of persuasive campaigns (Dejong, 2002; Hale & Dillard 1995; Sternthal & Craig 1974).

For example, in a study done by Freimuth, Hammond, Edgar, and Monahan (1990), results showed that fear appeals were exploited in up to 26% of anti-AIDS PSAs, signifying that health practitioners tend to view fear appeals as an effective health promotion tactic (Hale & Dillard, 1995). Many studies have centered on the “levels of fear factors”, which affect attitudes, intentions, and behavior (Janis & Feshbach, 1953). In terms of types of threats, specifically, Smith and Stutts (2003) indicated that most fear factors involved corporal health threats whereas few involved social fears. Also, it is widely accepted that fear-arousing messages and changes in attitude and behavior are highly related (Boster & Mongeau, 1984; Rogers 1975; Janis & Feshbach 1953).

Physical health threats and social threats

In anti-smoking campaigns, health campaign producers usually provide information about long-term dangers like cancer or other long-standing health-related issues (Smith & Stutts, 2003). Studies have determined that it is likely for younger audiences to disregard long-term health issues because they perceive the long-term physical threats as unlikely to happen (Smith & Stutts, 2003). Although including long-term risks in an anti-smoking campaign seems to have little effect on adolescents, short-term fear appeals (especially, negative social results of smoking, such as terrible breath, stinking hair, or yellow teeth) are considered more direct and therefore relatable to the target group (Smith & Stutts, 2003).

In studies of smoking, drinking, and drug prevention PSAs, the effects of each social or physical fear appeal were inconsistent, producing a variety of results. Schoenbachler and Whittler (1996) concluded that the use of social threats in the drug prevention PSAs showed a propensity to be more influential than those using physical threats. A qualitative study by

Wolburg (2001) revealed that college students detailed broad threats of binge drinking even if they felt generally safe about the possible outcomes of engaging in the activity. In the study, students acknowledged both physical and social results as a kind of danger that they might come upon once heavily consuming alcohol: being under the influence; use of illegal IDs; sexual occurrences, including rape; out of control/death; fights; damaging property; physical illness (alcohol poisoning, vomiting, and alcoholism; emotional penalties (disgrace, guiltiness, damaged mind-set, and poor judgment); the use of drugs with drinking; losing an academic reputation; and monetary difficulties. College students, according to Wolburg's study, often view the negative outcomes of binge drinking as negligible while the short-term effects are prominent.

To date, in spite of the fact that somewhat mixed results of using fear factors exist, a number of cases have indicated the effectiveness of applying physical and social threats to the message of health campaigns. Importantly, it has been suggested that message content, form, and style all should be tailored to the attributes of specific targets, rendering PSAs more effective (Atkin & Frimuth, 2001; Dervin & Frenette 2001). Thus, in the present study, the message content was created based on the findings previously addressed (Wolburg, 2001; Wechsler et al., 1998) concerning college students' perceptions toward the negative outcomes of binge drinking: short-term/long term physical health threats (vomiting, blackouts, a pounding hangover, and liver cancer), and social threats (missing classes, damaging academic career, losing family support, and losing friends). Figure 1 illustrates the focus of the present study in terms of fear-arousing messages.

The emphasis of message appeals

Belief appeals vs. Evaluative appeals

As discussed in the previous chapter, messages in public health campaigns should connect undesired behavior with negative outcomes or incentives (Atkin, 2001). Especially, it is noted that the appeals in a health campaign can stress either of the two basic components in the expectancy value formulation: the subjective probability of a consequence occurring (belief factor) or the degree of positive or negative valence of that outcome (evaluative factor) (Atkin, 2001, p. 60). In line with the exploration of relative effectiveness of source expertise and similarity in anti-binge drinking PSAs, the present study purports to explain how the PSA message emphasizes either on one's belief on the likelihood of negative outcomes or the evaluation of the consequences.

Also, the previous chapter argued that the expectancy-value theory could be applied to measure the effectiveness of each of the appeal components (belief and evaluative) (Salmon & Atkin, 2003): one's belief to some extent to expect the likelihood of having the outcomes resulted from the undesired behaviors and the evaluative to a considerable degree to how painful the consequence would be. In other words, it is essential to understand the utility of belief and evaluative appeals as components of composing the attitude models.

Thus, to increase the effectiveness of health campaigns (PSAs) targeting college students, it is important not only to dwell upon accepting the necessity of using unconventional appeals (bi and ei appeals) (Atkin, 2001), but also to ferret out relative effectiveness between belief-oriented appeals and evaluative-focused appeals on changing college students' binge drinking attitudinal and behavioral changes.

Conceptualizations of belief appeal and evaluative appeal using expectancy-value theory

Expectancy-value theory was initially intended to better explain the prediction of one's attitudes in relation to items or actions. This theory originally derived from psychologist Martin Fishbein, who suggests that attitudes are built up and adjusted according to judgments regarding beliefs and values (Fishbein & Raven, 1962). Fishbein and Azein (1975) argued that persons first react to new information about the objects and actions by constructing a belief about the objects and actions. Given that a belief previously presents, it is probable to be altered by novel information. Next, individuals allocate a value to each aspect where belief is located. Third, the psychological computation of beliefs and values leads to a creation of an expectation of attitudes or attitude development (Fishbein & Ajzen, 1975). In a few words, one's attitude is formed by a factorial function of beliefs (b_i) and evaluated values (e_i): all beliefs (b_i) about the objects or actions, loaded by the "evaluative sides" (e_i) of those beliefs (Areni & Lutz, 1988). Fishbein and Azjen (1975) characterized the theory with the following equation where

<Fishbein's Expectancy-value theory >

$$A_B = \sum_{i=1}^n b_i e_i$$

where:

A_B = Attitude toward the behavior

b_i = Likelihood or probability of consequence i

= The expectancy (perceived probability) of achieving that outcome

e_i = Evaluation of consequence i

= The valence (perceived value) of an outcome

Argument quality comprised of perceived strength (bi) and argument valence (ei)

In addition to evaluating the belief and evaluative components in light of the development of attitude via Fishbein's Expectancy-value model, those factors are also associated with comprising of a set of argument quality. Petty and Cacioppo (1981) state, "Argument quality is the audience's subjective perception of the arguments in the persuasive message as strong and cogent at one end of the scale and weak and specious at the other" (p. 264-5). According to Areni and Lutz (1988, p. 200), "An argument quality relies on two components, *perceived strength (bi)* and *argument valence (ei)*. Perceived strength is the audience's subjective probability that attitude is linked with consequences and argument valence is the audience's assessment of that consequence." Thus, an interesting structural analogy can be made in that individuals' subjective probability (bi) and their evaluation of the outcome (ei) are components of forming both attitude and argument quality.

Of particular importance in this regard is that, when the attitude can be expected by using the Fishbein's Expectancy-value theory, which message appeal between two message components (belief appeal and evaluative appeal) should be emphasized in terms of strengthening the argument quality. In other words, to know how each component plays a role of influencing in persuasion is important.

The theory framework of Argument quality

Argument quality is an important factor in persuasion (Johnson et al., 2004). As is well known, stronger arguments are likely to result in positive responses of cognition and affectation to the message, whereas weak arguments tend to produce negative results to the message (Areni & Lutz, 1988). Also, previous studies have concluded that weak arguments motivate resistance

in message recipients, resulting in unaltered initial views. Knowles and Linn (2004) indicated, “resistance is a reaction against change and resistance as attitude structure is comprised of three components: affective (ex: I don’t like it), cognitive (ex: I don’t believe it), and behavioral (ex: I won’t do it)” (p. 5). Commonly, people show a tendency to refuse to accept messages proposed to change their attitudes or thoughts. Interestingly, people are likely to resist even convincing messages if they are cognitively demanding to accept the message than they are eager to undertake (Festinger, 1957). When this nature of resistance is considered, the persuaders endeavor to craft convincing arguments by reducing the level of resistance.

Several researches have shown that people who obtain weak arguments and who have a high level of *outcome-relevant involvement*, a motivational state in which a person’s attitude about a particular object is connected to an outcome about which they are highly concerned, demonstrate negative attitude change, something known as the boomerang effect (Johnson & Eagly, 1989, p. 301). In terms of yielding a negative consequence for the message sender, the boomerang effect and resistance are analogous. However, the sharp contrast between them is enhanced by the fact that resistance reveals no significant movement from preliminary attitudes after the reception of a message, whereas a boomerang effect suggests significant attitudinal change, alienated from the message place (Johnson et al, 2003).

The reactance theory and the social judgment-involvement (SJI) theory are both theories that hold up to the boomerang effect. The reactance theory assumes that boomerang effects take place under the condition that the message may threat one’s free choice not to trust, creating changes against the desired effect (Fuegen & Brehm 2004; Sherman, Crawford, & McConnell 2004). SJI theory states that perceptual displacements mediate persuasion (Eagly & Chaiken, 1993, p. 430): “A person's existing attitudes form an interpretive framework for an incoming

message. When the message position falls in a person's range of acceptance, the result is an attitudinal shift toward the desired effect (the message position is assimilated). If the position is not in their range of acceptance, the message is more likely regarded as insignificant and no attitude change occurs (the message position is resisted)". As suggested by the SJI theory, a negative attitude change (called a boomerang effect), might take place with chiefly inconsistent messages in relation to people with high involvement. (Johnson et al., 2003). According to Sherif and his colleagues (1965, p. vi), SJI theorists regard highly-involved attitudes as constituent of "the ego or self-concept" as aspects of the "self-picture" are intimately felt and cherished. Thus, when comparing strong arguments with weak arguments, high outcome-relevant involvement prompts more influence in persuasion (Johnson and Eagly, 1989). Lack of motivation may promote resistance to cognitively assess the arguments presented when there is low involvement (Jacks & O'Brien, 2004).

In sum, the previous literature informs the nature of resistance (no attitude change in response to a message) in terms of argument quality. Generally, results indicate weak arguments generate resistance in attitude or even a boomerang effect, while strong arguments motivate people closer to the desired persuasion effect.

The effectiveness of Belief appeal and Evaluative appeal

Aside from the function of strong quality arguments in persuasion, the two components comprising the argument quality, bi (perceived strength) and ei (valence strength), have been explored in terms of their roles in persuasion. Few studies have shown substantiation supporting valence message (evaluative message: ei) over likelihood (belief message: bi) in determining argument quality and persuasion effect (Johnson et al, 2003).

A study was performed by Areni and Lutz (1988) to investigate the difference between perceived strength (bi) and argument valence (ei). In other words, the purpose of the study was to answer whether valence, instead of likelihood, underlies an argument quality's effects (valence hypothesis). Results demonstrated that although valence of arguments made a distinction of "strong" from "weak", likelihood of messages had no difference in informational values. In conclusion of this study, valence of messages was effective in strong arguments better than weak ones, while likelihood was effective very little. Another study conducted by Areni and Lutz (1988), using strong and weak advertisements and editorials (message type) adapted from Petty, Cacioppo, and Schumann (1983), created two argument qualities (bi and ei). Only argument valence (ei) was manipulated, leaving perceived strength (bi) untouched so that the ei message was more prominent for the advertising messages than bi message. Results indicated that the perceived strength (bi) only operated at a higher level of involvement than did argument valence (ei). According to Petty and Cacioppo (1981), high involvement matches to "*central route*" whereas low involvement corresponds to the "*peripheral route*". Petty and Cacioppo (1981) pointed out that, in the high involvement case, the quality of the arguments is considered in effect of persuasion while, in the low involvement, the other persuasion cues, for instance, source credibility and number of arguments, are more important to attaining persuasive effects than is message quality. Thus, in this study, it was concluded that "evaluative response to argument valence differences tend to be generated much more easily, and at a lower level of involvement, than cognitive responses to differential argument strength." (Areni & Lutz, 1988, p. 201). However, one drawback of this study was that the manipulation of the argument strength was not identified, leaving the findings inconclusive.

The study performed by Johnson et al. (2003) attempted to identify the valence hypothesis (whether valence, instead of likelihood, underlies an argument quality's effects). In their study, 38 students rated 24 arguments supporting the implementation of senior comprehensive exams developed by Petty et al. (1980). The arguments were evaluated by three dimensions: valence (anchored by: very bad to very good), likelihood (anchored by: very unlikely to very likely), and strength (anchored by: very weak to very strong). The results showed that the quality of argument (argument strength) was highly correlated to argument valence and not to perceived strength, maintaining the earlier study of the valence hypothesis.

Beyond the previous studies' focus on simple argument judgments tests, Johnson and his colleagues (2003) then tried to look into valence and likelihood in an attitude perspective. A 2 (valence: good vs. bad) X 2 (likelihood: high vs. low) factorial experiment was created, using message stimuli revised by Petty et al. (1980). In this study, likelihood represented a probability of whether the mentioned outcomes were in fact relevant to the argument, and valence was considered if the outcomes were advantageous. Since this study focused on attitude per se, the Fishbein's expectancy-value model was used. The study suggested that when the arguments were good, they yielded a persuasion regardless of whether the arguments were likely or unlikely to happen; but when the arguments were bad, the arguments resulted in being influential only when the arguments were perceived as likely. Thus, Arini and Lutz (1988)'s inference that argument likelihood (bi) can be effective under great elaboration was sustained.

Moving beyond the focus on the attitudinal dimension, Evans (1978)'s study using the Fishbein Behavioral Intention (FBI) model in a littering PSA compared the effectiveness of belief messages with evaluative messages on behavior intention. The FBI model is an upgraded form of the Fishbein attitude model, adding the subjective norm (Behavior Intention = Attitude

toward the behavior $\Sigma bi \times ei$ + Subjective norms). In his study, he found that the subjective norm (SN) had greater influence on BI (behavior intention) than attitude on behavior (AB). In terms of AB, $\Sigma bi \times ei$ had the most influence. Within $\Sigma bi \times ei$, belief about littering being distasteful (bi) had more influence than the evaluations of littering (ei) evaluation. However, Evans's study lacked explanation of why the bi component message had more influence in attitude than the ei message.

Although there are a number of cases supporting valence over likelihood as verifying argument quality and persuasions, few studies have addressed the rationale supposing that likelihood (bi) is able to identify argument quality and influence attitudes (Johnson et al., 2003). For example, Johnson (1994) indicated that, "participants' expertise on the issue possibly may well heighten the role of argument likelihood (bi). Knowledge gains can decrease the impact of argument quality because it has typically been manipulated" (p. 231). Thus, it is likely that individuals with more expertise follow cognitive likelihood in their judgments rather than affective valence (Johnson et al., 2004).

Research questions (Belief vs. Evaluative)

The first purpose of this study was to examine two different dimensions of messenger sources (expertise vs. similarity) in terms of "who says". Of particular importance in this regard was which messenger source, an expert or a peer, may be more effective in public health campaigns. The second purpose of this study was to test a dimension of PSA appeals in terms of "how tell." Mainly, the present study limited its focus to the role of each message appeal (bi vs. ei) in the persuasion in light of which appeal would be appropriate for targeting college students in terms of anti-binge drinking.

The message appeal used in the present study had two basic components comprised of the expectancy value formation ($\text{Attitude} = \sum b_i \times e_i$): belief appeals (likelihood) (ex: You are eight times more likely than non-binge drinkers to miss class), and evaluative appeals (valence) (ex: Think about how bad it is to experience vomiting). These can technically be organized into multiple types of fear-arousing content. That is to say, the majority of message appeals created for this study were predominantly negative valence (undesirable outcomes from binge drinking: hangover, blackouts, liver cancer, losing friends, etc.) except for the use of one positive valence (It may feel good to be the “life” of the party).

Also, it was reasonable to say that the perceived negative valence outcomes were likely to happen to college students since the sources of the outcomes were based on qualitative data, perceived hazards after binge drinking by college students (Wolburg, 2001) and also health information with regard to the aftermath of binge drinking (Wechsler et al, 1998). Thus, taking the fear-arousing message content based on college students’ perceptions into consideration, the message case would be regarded as a *bad/likely* situation.

In regard to the effectiveness of likelihood (b_i) and valence (e_i) in argument quality and persuasion, there was also a finding (Johnson et al., 2004) revealing that “negative” valence arguments (when the outcomes of what the arguments speak to is regarded as unwanted) were persuasive when they were judged as “likely”. Thus, on the surface, the *bad/likely* situation in this study might correspond to the previous findings (Johnson et al., 2004) where bad valence (e_i) arguments were persuasive when they were judged as high likelihood (b_i).

However, when it came to direct comparison between two components of argument quality, the previous literature (Johnson et al., 2004; Areni & Lutz, 1988) commonly confirmed

that valence (ei) tends to be more positively associated to persuasion by producing a stronger argument quality than likelihood (bi).

The study targets college students, the majority of whom tend to have taken part in at least one binge drinking experience. Accordingly, the bi appeal would likely be more effective in persuasion rather than the ei appeal, which would be in accordance with the prior finding (Johnson et al, 2004): expertise of message in recipients lead the bi appeals to be effective.

All in all, the findings previously reviewed about relative effectiveness of bi and ei in building a strong argument quality yield inconsistent results, leaving researchers unable to predict the role of each message appeal and its persuasive effectiveness. Also, there are few theories to clearly and directly explain how the argument quality components (bi and ei) act on the persuasion (attitudinal change, behavioral intentions) and their interaction. Thus, the second research question was developed.

RQ2: When the participants are exposed to the messages to having either belief or evaluative appeals, does the effectiveness of the message appeal likely to differ on the dependent variables? : (a) exhibiting favorable attitudes toward the anti-binge drinking PSA, (b) unfavorable attitudes toward binge drinking, and (c) less intention of engaging in binge drinking.

Match-up Hypothesis

The match-up hypothesis implies that consistency is important in relation to the spokesperson and product or issue images. In addition, if there is consistency then superior persuasive effects are also present because the hypothesis provides immediate information pertaining to the values and function (Kahle & Homer, 1985; Forkan 1980). With this in mind, using Tiger Woods to endorse golf sportswear suggests that the clothes he is wearing are superior to others because this “expert” “believes in them”. The audience may also associate the use of these clothes with the successful skills Woods possesses. In both instances, the values of the product rely on the immediate visual cues of the spokesperson (Perse, Nathanson, & McLeod, 1996).

The question of why well-suited image and oral facets result in positive ratings of messages has been answered using the social adaptation perspective (Kahle & Homer, 1985; Kahle 1984; Kahle & Timmer 1983). According to social adaptation, “beliefs of the person concerning *adaptive utility* (the message’s potential to provide valuable information in public) decides the degree of power of impact marked by messages.” (Kahle & Timmer, 1983, p.45). A viewer will pay more attention to messages if they perceive them to be valuable, raising the probability of persuasion on the basis of the quantity or quality of information given (Perse, Nathanson & McLeod, 1996).

A variety of advertising effectiveness research associated with the influence of a famous spokesperson frequently proposes that their attributes, for example, expertise, trustworthiness, and attractiveness, can boost effective communication so long as the famous endorser has a congruency in the product or brand (Moore, 2004). The match-up hypothesis formalized this idea of a celebrity fit with the product or brand (Lynch & Schuler. 1994; Kamins 1990; Solomon et al.,

1990; Kahle & Homer 1985). Continued research has supported the match-up hypothesis, relating it to source credibility and attitude formation (Lynch & Schuler, 1994; Kamins & Gupta 1994; Kamins 1990). For example, in an advertisement, Kamins (1990) pointed out that a good-looking celebrity (ex: Tom Selleck) was more effective on the credibility of the endorser and the advertising evaluation than a physically unappealing model when endorsing a sports car or other attentiveness-related goods. But, for advertising unconnected to attractiveness, such as one for a computer, the spokesperson (Telly Savalas) did not yield a high evaluation on the spokesperson credibility and attitude toward the advertising. From the study, Kamins (1990) found that the fit between spokesperson and characteristics of the product clarified the visual cue of the person determining the values of the product.

Correspondingly, a study by Friedman and Friedman (1979) found that there tends to be an interaction between different spokespersons and products/brands. For example, they found that celebrities were well matched with visual-oriented products such as costume jewelry. Also, while specialists tended to fit with technological goods such as computers, ordinary people were congruent with typical products like snacks. On the whole, augmenting the impact of advertising or public service announcements relies on the well-matches between the product representative and the item for consumption (Perse, Nathanson & McLeod, 1996).

Hypotheses and a Research Question

The match-up perspective implies that there will be a persuasive impact if a fit between a spokesperson and the product in advertising exists. For that reason, it is reasonable to predict that the degree of fit between a spokesperson and a message in the advertising will conclude whether or not the persuasive communication occurs (Moore, 2004). By the same token, when college

students are determined as a target audience of a PSA, anti-binge drinking messages are likely to be persuasive if the messenger matches with message appeal in college students' perceptions.

Salmon and Atkin (2003) indicated:

“A medical authority (who is regarded as a conventional source for health messages) such as a physician, researcher, or government health official, will strengthen the expertise dimension. This source is primarily important for belief-oriented messages focusing on the likelihood of consequences. However, peer models are important sources for young people in that they may not trust conventional sources.” (p. 460)

From the perspective of Salmon and Atkin, belief appeals relying on the likelihood of consequences tend to make the messages more believable for the audience because of their perceived expertise. Namely, the belief-oriented message matches with a medical source, a messenger who has expertise.

There is research that suggests that younger audiences, such as students, usually respond better to peers. Atkin (1994) stressed that the messengers who share similar characteristics of the audience tend to enhance the level of acceptance of the asserted message. In the context of anti-binge drinking PSA, a peer model as a health messenger may seem to share the value of binge drinking experiences with the message recipients, college students. Also, the evaluative appeal focusing on the perceived value of negative outcomes resulting from binge drinking may fit with a peer messenger in terms of the fact that the peer and the message recipients share similar feelings about negative consequences. Thus, assuming that the persuasion will be enhanced when the audience perceives the fit between the messenger and the messages, the present study hypothesized that:

H1-a: A PSA featuring an expert messenger in belief appeals will be more effective than a PSA featuring an expert messenger in evaluative appeals.

H1-b: A PSA featuring an expert messenger in belief appeals will be more effective than a PSA featuring a peer in belief appeals.

H2-a: A PSA featuring a peer messenger in evaluative appeals will be more effective than a PSA featuring a peer messenger in belief appeals.

H2-b: A PSA featuring a peer messenger in evaluative appeals will be more effective than a PSA featuring an expert in evaluative appeals.

In both hypotheses, the effectiveness of PSAs represents: (a) exhibiting favorable attitudes toward the anti-binge drinking PSA, (b) unfavorable attitudes toward binge drinking (measured by globally and with the expectancy-value model), and (c) less intention of engaging in binge drinking.

There is little theory or explanation regarding source-message congruency and its relative effectiveness on health persuasion. Thus, it is difficult to hypothesize whether or which source-message congruency would be more effective. The following research question was generated.

RQ3: Does the effectiveness of the source-message fit (expert/belief vs. peer/evaluative) differ in each case on the dependent variables?

The following chapter details the methodology used in this study, including data collection methods, development of the online survey, PSA stimuli, and statistical analyses of the collected data.

CHAPTER III

Methods

Design

Data were collected during the middle two weeks of April 2008. The experiment was conducted to test the three research questions and one hypothesis using a 2 x 2 between subject factorial design: 2 (messenger sources: an expert vs. a peer) X 2 (message appeals: belief vs. evaluative). Participants were randomly assigned to one of four experimental conditions: (a) an expert/belief message appeals (n=62); (b) a peer / belief message appeals (n=69); (c) an expert/evaluative message appeals (n=61); and (d) a peer model/evaluative message appeals (n=59). There were four covariates: (1) subjects' alcohol use in the past, (2) subjects' recent alcohol behavior, (3) subjects' past negative experiences as a consequence of drinking, and (4) the perceived quality of the PSA they saw in the study. See figure 1 for an experimental design.

		Messenger Sources	
		Expert	Peer
Message Appeals	Bi	Cell 1 (n=62)	Cell 2 (n=69)
	Ei	Cell 3 (n=61)	Cell 4(n=59)

Figure 1. Experimental Design

Subject

Undergraduate students (N=251) at the University of Georgia were recruited through an online e-mail survey (surveymonkey.com). Female participants made up 68% of the sample,

while males made up 32 %. The registrar office at the University of Georgia provided 2,000 undergraduate students' emails. The list of undergraduate students that were currently enrolled at the time, excluding those with a restricted record, was entered into an Excel file. Using the random number generator, a number was assigned to each student. Then, the list was sorted according to the number that was assigned. Next, the number of students (2,000) was selected. There was no specific check on rank. The total response rate for total 7 cells was 27.5% (N=549) and the usable data rate for 4 treatment groups was 72.5% (N=251).

Subjects were assigned randomly to one of four treatment groups. Research has suggested that a minimum of 30 participants are needed in each of the cells in order to create desired conditions for quantitative research (Wimmer & Dominick, 2003), a requirement which was met by the current study (the number of subjects in each cell was over 50). Subjects were entered into a random drawing for cash prizes (total \$450) in return for their participation. In the pretest, 136 students participated.

Stimulus Materials

Four different versions of a transcript for an anti-binge drinking radio PSA were created. A radio PSA was adopted because it has the most reach-accessibility among any medium (Radio Facts for Advertisers, 1990) and also because radio is a popular medium for younger audiences (Tresie & Weigold, 2001). The targets of anti-binge drinking in this study were American college students. Furthermore, many studies have indicated that a spokesperson's physical attractiveness, voice, and gender are among factors that tend to influence subjects in persuasive appeals. For example, research has shown that American listeners tend to show more positive attitudes toward accents that are close to their own while indicating unfavorable ratings to non-American accents

(Brown, Giles & Thakerer, 1985; Callan, Gallois, & Forbes, 1983; Stewart, Ryan, & Giles, 1985).

In another study, listeners judged physicians' professional ability according to their different speaking style using high- and low-pitch voices as an indicator (Ray, Ray, & Zahn, 1991). In fact, it is impossible to know whether subjects in the current study responded to the intended manipulations of the models or to other stimulus factors such as a spokesperson's gender, voice characteristics, tone, or even accents if a real person speaks in radio PSAs. For that reason, the radio PSA transcribed scripts were employed, and the spokesperson name was gender neutral.

To manipulate messenger sources (expertise vs. similarity), an expert (a medical doctor who is Director of the North Georgia Addiction Rehabilitation Center) and a peer (a UGA student) were featured in the PSAs that were created for the study. In addition, possible explanations to enhance the source manipulation were added. To illustrate, the transcript for the expert included the following additional information: I have many years of experience in the medical field. Likewise, the peer included the following: In many ways, I am just like you. Also, Pat Michaels was used as both messengers' name to avoid gender specificity.

To make certain that participants understood the definition of binge drinking in a way that was meaningful for the purposes of the present study, the official definition of binge drinking (Harper, 2005) was described in the message stimuli.

Also, in order to better ensure that the subjects would perceive the PSA as a realistic radio PSA, additional information was included in both PSAs. The transcript for both the PSA utilizing the peer messenger and the PSA using the expert messenger included the following: For more information, visit w-w-w-dot-binge-drinking-prevention-dot-o-r-g or call 1-800-300-2222. A public service message brought to you by the North Georgia Anti-Addiction Alliance.

Belief message (bi) is the subjective probability of a consequence occurring while evaluative message (ei) is the degree of positive or negative valence of that outcome (Atkin, 2001). In this study, bi appeals mainly focused on the likelihood of undesirable outcomes of binge drinking (e.g., you are 8 times more likely than non-binge drinkers to miss class). The ei appeals created were predominantly focused on bad valence (e.g., think about how bad it is to have to throw up) aside from one good valence (e.g., it may feel good to be the “life” of the party).

The message content for each treatment was created based on the findings previously addressed (Wolburg, 2001; Wechsler et al, 1998). The content includes the college students’ perception of (a) binge drinking’s negative outcomes: short-term/long term physical health threat (e.g., vomiting, blackouts, a pounding hangover, and liver cancer); and (b) social threats (e.g., missing classes, damaging academic career, losing family support, and losing friends).

Pretest-Manipulation checks

One hundred thirty six undergraduate students from the same university in which the main study was undertaken were utilized in the pretest. These subjects were selected because they represented a separate group from the main study subjects. Accordingly, they did not have any probability of tainting this study by being aware of the nature of the experiments (Kamins, 1990).

To measure similarity and expertise in terms of messenger source manipulation, participants were asked to rate the similarity and expertise of messenger sources using a 7-point Likert scale with 7 items; 1 represented “strongly disagree” and 7 represented “strongly agree”. The statements included: I think that the spokesperson in the PSA is “similar to me”, “similar to

me in his/her behavior”, “expert”, “experienced”, “knowledgeable”, “qualified”, and “skilled” ($\alpha = .74$ for source similarity; $\alpha = .72$ for source expertise).

To measure belief message (bi) and evaluative message (ei) in terms of message appeal manipulation, participants were asked to rate the belief message and evaluative message using a 7-point Likert scale with 7 items: I think that the message in the PSA is a strong argument. As previously addressed, argument strength is defined as the audience's subjective probability (belief) that the attitude object is associated with certain outcomes, while argument valence (evaluative) is the audience's evaluation of that consequence (Areni & Lutz, 1988). Once again, the argument strength (bi) and argument valence (ei) were the components of comprising argument quality. In this study, by asking only the argument strength (bi) (ex: after reading the anti-binge drinking PSA, I think that the message in the PSA is strong argument) to subjects, and later, comparing the mean value of strength (bi appeal) item with bi appeal and ei appeal, it could be determined that the message appeals were manipulated as intended ($\alpha = .91$ for likelihood-bi; $\alpha = .88$ for valence-ei).

Procedures

The experiment using a questionnaire and transcripts of radio PSAs was conducted online (surveymonkey.com). Students could participate in the online experiment anytime during the given period and anywhere they could access the Internet. All participants were instructed to read and answer all questions.

Each participant was instructed to view one transcribed script of an anti-binge drinking PSA. Before beginning the survey, participants were asked to complete a questionnaire about their personal background along with their drinking knowledge and experiences. The subjects

were questioned about their binge drinking experience, past drinking patterns, negative experiences with binge drinking, and perceptions of the PSA. After the transcribed PSA was viewed, each participant was asked to complete a questionnaire indexing the effectiveness of PSAs and the binge drinking behavior intention via a series of multiple-choice items. In a coding procedure, the sub-sample that had no recent binge drinking experience was screened out of the sample (N=21). As a result, every member of the sample for whom message effects are reported acknowledged at least a minimal level of binge drinking behavior in the recent past [1 month].

Measures

- Dependent variables

There were three dependent variables included in the model: (1) attitude toward the anti-binge drinking PSA; (2) attitude toward binge drinking; and (3) behavioral intention of binge drinking. Distinctively, the attitude toward binge drinking was assessed in two different attitude ways: (a) global attitude toward binge drinking and (b) expectancy-value attitude toward binge drinking (Fishbein's model).

(1) Attitude toward the anti-binge drinking PSA

Attitude toward the PSA reveals how people feel about an ad that affects their pre-inclination to respond positively or adversely to the content (Perse, Nathanson, & McLeod, 1996). Attitude toward the advertisement in the current study was measured using the scales adapted and to some extent modified from the attitude studied by MacKenzi and Lutz (1989) and Madden, Allen, and Twible (1988). PSA attitude was evaluated with five 7-point Likert-type scales, anchored by strongly disagree and strongly agree (ex: after reading the anti-binge

drinking PSA, I think that the *MESSAGE* in the PSA is “likable”, “interesting”, “good”, “favorable”, and “pleasant”). The Cronbach alpha coefficient of reliability for this 5-scale summated measure was .87, which is substantially higher than the minimum level of reliability (.70) recommended by Nunnally (1978).

2-(a) Global Attitude toward binge drinking

Global attitude toward anti-binge drinking was measured by asking subjects “After reading the anti-binge drinking PSA, I think that *BINGE DRINKING* is” via averaged responses on four 7-point Likert scales (harmful/beneficial, unpleasant/pleasant, bad/good and worthless/valuable) (alpha=.91). Global attitude toward binge drinking was also measured using the scales adapted and slightly modified from the attitude studied by MacKenzi and Lutz (1989) and Madden, Allen, and Twible (1988).

2-(b) Expectancy-Value attitude toward binge drinking

Besides the global attitude evaluation, the attitude toward binge drinking was assessed via Fishbein’s Expectancy-value theory (Attitude Model) with the formula.

$$A_B = \sum_{i=1}^n b_i e_i$$

where:

A_B = Attitude toward the behavior
 b_i = Likelihood or probability of consequence i
 e_i = Evaluation of consequence i

This measure was built up as the summation of each subject’s attribute specific belief strength score for the likelihood of each of the bad outcomes of binge drinking (b_i) multiplied by

the respective evaluation of the likelihood (e_i) (cf., Smith & Swinyard, 1983). Each negative message component from the message content was included in the calculation.

The form of the b_i questions was “After reading the anti-binge drinking PSA, I feel that if I participate in binge drinking, it will cause the symptoms of vomiting” (b_1 =will cause the symptoms of vomiting, b_2 =will cause the symptoms of blackouts, b_3 =will cause the symptoms of a pounding hangover, b_4 = will cause liver cancer, b_5 =will cause me to miss class, b_6 =will cause me to damage my academic career, b_7 =will cause me to lose family support, and b_8 =will cause me to lose my friends). The end points were labeled “extremely unlikely” and “extremely likely”.

The form of the e_i questions was “In general, I feel that vomiting is.....” (e_1 =vomiting is, e_2 =blackouts are, e_3 =a pounding hangover is, e_4 = liver cancer is, e_5 =missing classes is, e_6 = damaging my academic career is, e_7 = losing family support is, and e_8 = losing my friends is). The end points were labeled “extremely bad” and “extremely good”.

This key dependent variable was constructed by following the computation order. Each e_i component was multiplied to the b_i component ($b_i * e_i$) and summed up ($b_1 * e_1 + b_2 * e_2 + b_3 * e_3 + \dots + b_8 * e_8$). According to the fact that the scales were coded respectively on a scale from -3 to +3, the interpretation was expected that anything with a negative value represents a positive attitude toward binge drinking. In other words, lower scores indicated more positive attitudes. (In this case, the mean summated attitude value was corrected, yielding a theoretical range -9 to 9). The summated $b_i * e_i$ measure is consistent with the measure of attitude proposed by Fishbein and Ajzen (1975).

(3) Behavior intention to binge drink

Subjects were asked to indicate the extent to which the PSA ad had increased the chance that they would consider binge drinking in the near future. The behavior intention was measured on three descriptive items with a 7-point Likert scale. The questions about binge drinking behavior were calibrated following the Sheth study (1974). The descriptive items for this measure include: “After reading the anti-binge drinking PSA, I think that I intend to binge drink in the forthcoming month” (anchored by “extremely unlikely” and “extremely likely”); “I will try not to binge drink in the forthcoming month” (anchored by “definitely true” and “definitely false”); and “I plan to binge drink in the forthcoming month” (anchored by “strongly disagree” and “strongly agree”). A reliability test confirmed that these items were also internally consistent ($\alpha=.95$). The questionnaires for the experiments are demonstrated in Appendix A-2.

- Covariates

Data on a number of covariates that could confound the effects between messenger sources and message appeals on persuasion were also collected. There were a total of four potential covariates: three covariates were subject’s past experiences related to binge drinking and recent alcohol behavior and the last one was associated with the perceived quality of the transcribed radio PSAs used in this experiment. The function of the covariates was to control for the influence of extraneous variables (Hair et al. 1998). More specifically, the two questions related to a subject’s past alcohol uses (drinking patterns) were “Think back over the past few months, how many times did you have five or more drinks at a sitting?”, and “In the last two

weeks, how many times have you had five or more drinks in a row?" These questions were based on the Harvard School of Public Health College Alcohol Study (CAS) (1999).

Also, subjects' past experience of negative outcomes due to binge drinking was asked with "Did any of followings occur as a consequence of your drinking?" (vomiting, blackouts, a pounding hangover, liver cancer, missing classes, lower grades, losing family support, and losing close friends) These consequences were the same as the message content used in PSA message stimuli. The Yes/No response were dummy coded 1 and 0, respectively and summed in to a negative past experience index rotationally ranging from 0 to 9.

Finally, the question associated with PSA message quality was, "After reading the anti-binge drinking PSA, do you think the message was high quality?" this covariate was measured using a 7-point scale ranging from "strongly disagree" (1) to "strongly agree" (7).

CHAPTER IV

DATA ANALYSIS RESULTS

Summarized results of the experiment are reported in this chapter. Following scale construction and reliability analysis, there were two stages to data analysis. First, *t* tests were used to check the effectiveness of messenger source and message appeal manipulation. Then, a multivariate analysis of variance, with covariates (MANCOVA) was used to test the one Hs of the study and to answer the three research questions.

Manipulation checks

The first step in the analysis was to check the effectiveness of the experimental manipulations. Multiple item measures, adapted from the study by Price, Feick and Higie (1989) were used to determine the manipulations of similarity and expertise, one of the independent variables. A 7-point Likert scale with seven items was used and subjects responded to each statement using a 7-point scale with 1 representing strongly disagree and 7 strongly agree: I think that the spokesperson in the PSA is “similar to me”, “similar to me in his/her behavior”, “expert”, “experienced”, “knowledgeable”, “qualified”, and “skilled”. A reliability test confirmed a sufficient level of internal consistency for both measures ($\alpha = .74$ for source similarity; $\alpha = .72$ for source expertise), suggesting no need to remove any items from the original scales for the manipulations checks. As shown in Table 1, two independent sample *t*-tests revealed statistically significant differences between treatment groups for both factors of source

similarity($t = -3.309$, $p < .005$) and source expertise ($t = 10.739$, $p < .001$) . Thus, group differences on the dependent measures could be reasonably ascribed to the treatments.

In regard to belief and evaluative appeal manipulation checks, the other independent variable, a reliability test was conducted which showed an adequate level of internal consistency for both measures (alpha = .91 for bi; alpha = .88 for ei). In this study, only the argument strength (bi) (ex: after reading the anti-binge drinking PSA, I think that the message in the PSA is a strong argument) was asked of subjects; the answers were then compared to the mean value of strength (bi) item with the overall bi appeals and ei appeals. As indicated in Table 1, an independent sample t-test revealed statistically significant differences between treatment groups for perceived strength (bi appeal)($t = 2.100$, $p < .05$). More specifically, participants ranged the belief appeal as a stronger argument (perceived strength) ($M = 4.05$, $SD = 1.352$) than the evaluative appeal ($M = 3.68$, $SD = 1.145$).

Overall, source manipulation check (if subjects actually perceived an expert as having expertise and a peer as having similarity) and appeal manipulation check (if participants indeed perceived belief appeal as the strong argument) were successfully supported. See TABLE 1 for a summary of the results of the manipulation check.

Table 1

Independent Samples T-Tests: Manipulation Checks (Pretest)

Variable		N	Mean (max. =7)	SD	T-value
Expertise	expert	60	5.35	1.35	10.74***
	peer		3.67	1.11	
Similarity	expert	76	3.35	1.24	-3.31**
	peer		3.89	1.34	
Belief Appeal	belief	136	4.05	1.35	2.10*
	evaluative		3.68	1.45	

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$

Research Questions and Hypothesis Testing**Assumption Testing**

Prior to investigating treatment effects with multivariate analysis of covariance (MANCOVA), a variety of assumptions were tested. Foremost, the assumption of normality was successfully verified by skewness and kurtosis statistics in terms of the dependent variables and covariates. Second, the homogeneity of variance was satisfied among the covariance matrices by a non-significant Box's M test, $F(30, 16376) = .642, p = .935$. Third, in a covariate analysis, covariates must be correlated with the dependent variables (Hair et al, 1998). A correlation matrix suggested that all of the covariates were correlated with a least one of the dependent variables. Fourth, before using MANCOVA it is important to identify any outliers that affect the level of type I error and distort the results (Hair et al, 1998). An investigation of studentized residuals across the dependent variables indicated four cases as outliers. Thus, the sample size was reduced to 251 observations. Finally, Levene's test was conducted to test if each dependent

variable was similar variance for all groups (all cells in the factor design matrix). The homogeneity of variances assumption was met for attitude toward the PSA in subjects' intention to engage in binge drinking and expectancy-value attitude, but not for global attitude toward binge drinking. However, the failure to meet the assumption of homogeneity of variances in this one instance is not fatal to ANOVA, particularly when groups are of equal sample size.

Research questions and Hypothesis Testing

A 2 x 2 MANCOVA was conducted to determine the effect of the type of messenger sources (expert vs. peer) and message appeals (bi vs. ei) as the two factors, and four covariates (subjects' alcohol use in the past (1), most recent alcohol use (2), their past negative experiences as a consequence of drinking (3), and the perceived quality of the PSA they saw in the study (4)) on the three dependent variables: (a) attitude toward the anti-binge drinking PSA, (b) attitude toward binge drinking, and (c) intention to binge drink. Multivariate and univariate effects are reported in Table 2.

Table 2

MANCOVA: Effects of Sources and Appeals on Dependent Variables

	Multivariate Effects		Univariate Effects			
	Wilks's λ	F (4, 240)	F (1, 243)			
			Attitude toward PSAs	Global attitude toward binge drinking	Expectancy-value attitude toward binge drinking	Intention to binge drink
Covariate:						
Drinking pattern 1 (past)	0.94	3.73**	2.16	11.58 **	1.42	11.33 **
Drinking pattern 2 (recent)	0.89	7.38***	0.00	1.22	3.19	24.34 ***
Consequence of drinking	0.96	2.02	0.90	1.64	6.02 *	4.46 *
PSA quality	0.49	63.78***	255.38 ***	18.37 ***	13.55 ***	12.78 ***
Factors:						
Source (expert vs. peer)	0.95	3.49**	13.59 ***	0.55	1.09	0.33
Appeal (bi vs. ei)	0.99	0.89	0.01	2.64	2.29	0.99
Source x Appeal interaction	0.96	2.28*	1.93	5.61 **	6.39 **	3.50*

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$

Note. Reported significance levels are based on two-tailed tests with the exception of the significant interactions, which are interpreted as one-tailed tests of directional hypotheses [H1. and H2].

Effect of Covariates

Along with the quality of message stimuli in this study, subjects' alcohol use (drinking patterns), both in the past and most recently, and the negative experiences resulting from binge drinking were included as covariates for the three research questions and one hypothesis testing to control for their effects on the dependent variables. The purpose of measuring these covariates

was to minimize the influence of extraneous variables (Hair et al. 1998), ensuring more accurate information pertaining to the effects of the PSAs used in this study.

Subjects' alcohol use in the past ($M=1.71$, $SD=.99$) indicated that 57.4% had five or more drinks in one sitting in the past few months while 35% had five or more drinks in a row twice per week or 3 to 5 times per week. Their most recent drinking patterns ($M=1.77$, $SD=1.17$) revealed that 63% of them recently had five or more drinks in a row (defined as a binge drinker), which means the majority of subjects have had binge drinking experiences. As shown in Table 2, they had significant multivariate effects, past (Wilks's $\lambda = .94$, $F(4, 240) = 3.73$, $p < .05$), and most recent (Wilks's $\lambda = .89$, $F(4, 240) = 7.38$, $p < .01$). Examination of univariate effects showed that neither past nor most recent alcohol uses had significant effects on attitude toward the PSA; however, the past alcohol uses have a significant effect on global attitude toward binge drinking, Fishbein's attitude toward binge drinking (most recent only), and intention to binge drink (both past and most recent alcohol uses).

Subjects perceived that the PSA message in the experimental study had a neutral quality ($M=3.87$, $SD=1.407$). As indicated in Table 2, high quality as a covariate had significant multivariate effects (Wilks's $\lambda = .49$, $F(4, 240) = 63.78$, $p < .01$). Also, a significant difference on all dependent variables was observed.

The last covariate considered is the negative outcome experiences resulting from binge drinking corresponding to the message of the PSAs in this study (vomiting, blackouts, a pounding hangover, liver cancer, missing classes, lower grades, losing family support, and losing close friends). Even if only a few were detected as having one or more experiences of these negative outcomes, the majority of subjects (75%) did not have the experiences. The negative experience of binge drinking outcomes as a covariate had marginally significant multivariate

effects (Wilks's $\lambda = .96$, $F(4, 240) = 2.02$, $p < .10$). Also, a significant difference on only Fishbein's attitude toward binge drinking and intention to binge drink was observed.

Main effect Analysis – Expert vs. Peer

RQ1: When the participants are exposed to messenger sources having either expertise or similarity, does the effectiveness of messengers (expert versus peer) likely to differ on the dependent variables? : (a) exhibiting favorable attitudes toward the anti-binge drinking PSA, (b) unfavorable attitudes toward binge drinking, and (c) less intention of engaging in binge drinking.

The first research question (main test) explored the effectiveness of messenger sources (expert vs. peer) on the dependent variables. A MANCOVA was conducted to determine the effect of messenger sources on the four dependent variables: the attitude toward the PSA, the global attitude toward binge drinking, the expectancy-value attitude toward binge drinking, and the intention to binge drink. A significant difference was found among messenger sources on dependent measures (Wilks's $\lambda = .95$, $F(4, 240) = 3.485$, $p < .05$). The multivariate η^2 based on Wilks's λ was .06, medium effect, (ex: .01, .06, and .14 interpreted as small, medium, and large effect sizes, respectively) (Green & Salkind, 2003). Table 3 contains the means and the standard deviations on the dependent variables for the messenger sources.

Analyses of variance (ANOVA) on the dependent variables were conducted as follow-up tests to the MANCOVA. The ANOVA only on the attitude toward the PSA was significant ($F(1, 243) = 13.587$, $p < .01$, $\eta^2 = .05$) while not significant on the attitude toward binge drinking and

intention to binge drink. Bonferroni's Post hoc analyses to the univariate ANOVA for the attitude toward PSA consisted of conducting a pair-wise comparison to find which messenger sources most affected the PSA attitude. The peer (similarity source) messenger produced a significant superiority on showing a favorable PSA attitude in comparison with the expert (expertise source). Thus, these results suggested that messenger source effect was seen on the one dependent variable, the attitude toward the anti-binge drinking PSA. Specifically, a peer model in the PSA ascribed the subjects to have more favorable attitude toward the anti-binge drinking PSA than an expert model. However, when it came to the attitudinal and behavioral changes of binge drinking, there were no significant differences between messenger sources.

Table 3.

Mean and Standard Deviation Values for the Dependent Measures within Each Experimental Condition and across Each Independent Variable

Experimental condition		Variable							
		Attitude toward PSAs		Global attitude toward binge drinking		Expectancy-value attitude toward binge drinking		Intention to binge drink	
		M	SD	M	SD	M	SD	M	SD
Source	Expert	3.91	1.16	2.3	1.17	-1.22	4.18	2.64	2.04
	Peer	4.30	1.17	2.21	1.06	-1.74	4.32	2.53	2.03
Message	Bi	4.11	1.11	2.16	1.13	-1.85	4.32	2.49	2.08
	Ei	4.10	1.22	2.35	1.09	-1.11	4.13	2.67	1.98
Interactions	Expert/Bi	3.99	1.16	2.06	1.09	-2.20	4.08	2.37	2.03
	Peer/Bi	4.24	1.06	2.25	1.17	-1.50	4.53	2.61	2.14
	Expert/Ei	3.83	1.17	2.55	1.21	-0.25	4.13	2.90	2.04
	Peer/Ei	4.37	1.29	2.16	0.94	-1.98	4.10	2.45	1.93

Note. Mean Value for the PSA score and Global attitude: 1 =strongly disagree, 7= strongly agree". Mean Value for the Expectancy-value attitude: belief appeal, 1= extremely unlikely, 7= extremely likely and evaluative appeal, 1 = extremely bad, 7= extremely good. Recode: 1 to -3 and 7 to 3. Mean Value for the Intention to binge drink: 1 = extremely unlikely, definitely false, and strongly disagree, 7=extremely likely, definitely true and strongly agree.

Main effect Analysis– belief appeal (bi) vs. evaluative appeal (ei)

RQ2: When the participants are exposed to messages having either likelihood or valence appeals, does the effectiveness of the message appeals differ on the dependent variables? :
(a) exhibiting favorable attitudes toward the anti-binge drinking PSA, (b) unfavorable attitudes toward binge drinking, and (c) less intention of engaging in binge drinking.

The second research question explored the role of message appeals (bi vs. ei). A MANCOVA was also conducted to find out the effect of message appeals on the same dependent variables and non-significant difference was found among message appeals on the four of the dependent variables (Wilks's $\lambda = .99$, $F(4, 240) = .892$, $p = .470$, $\eta^2 = .02$). Furthermore, no individual dependent variables exhibited a significant main effect of the message appeal treatment.

Interaction Analysis – Messenger Sources and Message Appeals Match

H1-a: A PSA featuring an expert messenger in belief appeals will be more effective than a PSA featuring an expert messenger in evaluative appeals.

H1-b: A PSA featuring an expert messenger in belief appeals will be more effective than a PSA featuring a peer in belief appeals.

H2-a: A PSA featuring a peer messenger in evaluative appeals will be more effective than a PSA featuring a peer messenger in belief appeals.

H2-b: A PSA featuring a peer messenger in evaluative appeals will be more effective than a PSA featuring an expert in evaluative appeals.

In both hypotheses, the effectiveness of PSAs represents: (a) exhibiting favorable attitudes toward the anti-binge drinking PSA, (b) unfavorable attitudes toward binge drinking (measured by globally and with the expectancy-value model), and (c) less intention of engaging in binge drinking.

This study applied the match-up hypothesis to the nature of the messenger source – appeal match. A MANCOVA was conducted to determine the effect of matches (the interaction) between messenger sources and message appeals on the four dependent variables: (a) the attitude toward a PSA, (b) the global attitude toward binge drinking, (c) the expectancy-value attitude toward binge drinking, and (d) the intention to binge drink. A significant interaction was found indicating Wilks's $\lambda = .96$, $F(4, 240) = 2.282$, $p < .05$. The multivariate η^2 based on Wilks's λ was .04. The significant interactions were interpreted as one-tailed tests of directional hypotheses [H1 and H2].

Follow-up ANOVA on the dependent variables revealed that the interaction had an impact on the global attitude toward binge drinking, the expectancy-value attitude toward binge drinking, and on intention to binge drink, but not on the attitude toward the PSA (see Table 2).

Specifically, ANOVA on the global attitude toward binge drinking ($F(1, 243) = 5.607$, $p < .01$, $\eta^2 = .02$), on the expectancy-value attitude toward binge drinking ($F(1, 243) = 6.387$, p

$<.01$, $\eta^2 = .03$) and the intention to binge drink ($F(1, 243) = 3.496$, $p < .05$, $\eta^2 = .02$) showed a significant level. However, ANOVA on the attitude toward PSA ($F(1, 243) = 1.934$, $p = .166$, $\eta^2 = .01$), revealed a non-significant level.

The post hoc analyses to the univariate ANOVA for the global attitude toward binge drinking, the expectancy-value (Fishbein) attitude toward binge drinking, and the intention to binge drink were conducted to have pair-wise comparisons to find match effect. In terms of interpreting the data results, one of the dependent variables, attitude toward the PSA, is different from the other three dependent variables. For example, when it comes to the attitude toward the PSA items (ex: *after reading the anti-binge drinking PSA, I think that the message in the PSA is "likable", etc.*) higher scores mean a favorable attitudinal response.

On the contrary, the lower scores of the global attitude toward binge drinking, Fishbein's attitude toward binge drinking, and intention to binge drink all represent a positive attitudinal and behavioral response (ex: *after reading the anti-binge drinking PSA, I think that binge drinking is harmful/beneficial, unpleasant/pleasant, bad/good and worthless/valuable*). From these points of views, the interpretation of mean difference between source and appeal fit was expected that, regarding attitude toward the PSA, the positive value of mean difference between source and appeal combination illustrates positive relations between them. In regard to the rest of the dependent variables, the negative value of mean difference between source and appeal match also describes positive relations among the fits.

H1(a) predicted that a PSA featuring an expert messenger in a belief appeal (Expert/Bi) will be more effective than a PSA featuring an expert messenger in an evaluative appeal (Expert/Ei). The results exhibited that an Expert/Bi match generated significantly superiority in comparison with Expert/Ei, partially supporting for H1(a) in terms of global attitude toward

binge drinking ($M_{\text{Expert/Bi}}=2.06$, $M_{\text{Expert/Ei}}= 2.55$, $p < 0.01$), expectancy, and value attitude toward binge drinking ($M_{\text{Expert/Bi}}= -2.20$, $M_{\text{Expert/Ei}}= -.25$, $p < 0.01$), and intention to binge drink ($M_{\text{Expert/Bi}}= 2.37$, $M_{\text{Expert/Ei}}= 2.90$, $p < 0.05$). As for attitude toward PSA, no significant difference was observed.

H1 (b) predicted that the Expert/Bi match will be more effective than a PSA featuring a peer in a belief appeal (Peer/Bi). The results showed that an Expert/Bi combination for attitude toward PSA produced significantly inferiority in comparison with Peer/Bi ($M_{\text{Expert/Bi}}= 3.99$, $M_{\text{Peer/Bi}}= 4.24$, $p < 0.05$). However, in regard to global attitude toward binge drinking, expectancy, and value attitude toward binge drinking and intention to binge drink, there were no significant differences between Expert/Bi and Peer/Bi; hence, there was partial support for H1(b).

H2 (a) expected that a PSA featuring a peer messenger in an evaluative appeal (Peer/Ei) will be more effective than a PSA featuring a peer messenger in a belief appeal (Peer/Bi). When it comes to Peer/Ei and Peer/Bi combination, there were no statistically significant differences in all dependent variables, leading to no support for H2 (a).

H2 (b) predicted the Peer/Ei match will be more effective than a PSA featuring a doctor in an evaluative appeal (Expert/Ei). The results indicated that a Peer/Ei match yielded significant superiority in comparison with Expert/Ei across all the dependent variables, yielding full support for H2 (b). Specifically, there were significant differences between Peer/Ei and Expert/Ei as for attitude toward the PSA ($M_{\text{Peer/Ei}}= 4.37$, $M_{\text{Expert/Ei}}= 3.83$, $p < .001$), global attitude toward binge drinking ($M_{\text{Peer/Ei}}= 2.16$, $M_{\text{Expert/Ei}}= 2.55$, $p < .05$), expectancy, and value attitude toward binge drinking ($M_{\text{Peer/Ei}}= -1.98$, $M_{\text{Expert/Ei}}= -.25$, $p < .01$) and intention to binge drink ($M_{\text{Peer/Ei}}= 2.45$, $M_{\text{Expert/Ei}}= 2.90$, $p < .05$). See Table 4 for a summary of the results of hypotheses 1 and 2.

Table 4

Interaction Hypotheses testing

Mean Difference [Estimated Marginal Means]				
Hypothesis 1	Attitude toward PSAs	Global attitude toward binge drinking	Expectacny-value attitude toward binge drinking	Intention to binge drink
Expert/Bi - Expert/Ei	.16	-.49**	-1.95**	-.52*
Expert/Bi - Peer/Bi	-.25*	-.20	-.70	-.23
Hypothesis 2				
Peer/Ei - Expert/Ei	.14	-.09	-.49	-.16
Peer/Ei - Peer/Bi	.54***	-.38*	-1.74**	-.45*

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$

Note. All significance levels reported are based on one-tailed tests of directional hypotheses.

Regarding interpretation of all mean difference scores, a negative sign indicates that the second term in the difference score has a higher value than the first term in the algebraic expression, while a positive sign indicates that the first term in the expression has a higher value.

Thus, a positive sign for the mean difference for the PSA score indicates greater effectiveness of the first term [combination of source and appeal] in the algebraic expression, whereas for all the other dependent variables, a negative sign for the mean difference indicates greater effectiveness for the first combination. All hypotheses predicted greater effectiveness for the first combination of source and appeal represented in the difference scores above.

RQ3: Does the effectiveness of the source-message fit (expert/belief vs. peer/evaluative) differ in each case on the dependent variables?

The final research question aimed to analyze any difference in effectiveness of source-message fit on dependent variables from each case (an Expert/ Bi versus a Peer/Ei).

One result found that the Peer/Ei combination had a more positive attitude toward the PSA than Expert/Bi mix ($M_{\text{Expert/Bi}} = 3.99$, $M_{\text{Peer/Ei}} = 4.37$, $p < .05$). However, there were no significant

differences in the rest of the dependent variables. See Table 5 for a summary of the results of research question 3.

Table 5

Interaction Research Question testing

Research Question 3	Mean Difference [Estimated Marginal Means]			
	Attitude toward PSAs	Global attitude toward binge drinking	Expectacny-value attitude toward binge drinking	Intention to binge drink
Expert/Bi - PeerEi	-.38*	-.11	-.22	-.07

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$

Regarding interpretation of all mean difference scores, a negative sign indicates that the second term in the difference score has a higher value than the first term in the algebraic expression, while a positive sign indicates that the first term in the expression has a higher value.

Thus, a positive sign for the mean difference for the PSA score indicates greater effectiveness of the first term [combination of source and appeal] in the algebraic expression, whereas for all the other dependent variables, a negative sign for the mean difference indicates greater effectiveness for the first combination. All hypotheses predicted greater effectiveness for the first combination of source and appeal represented in the difference scores above.

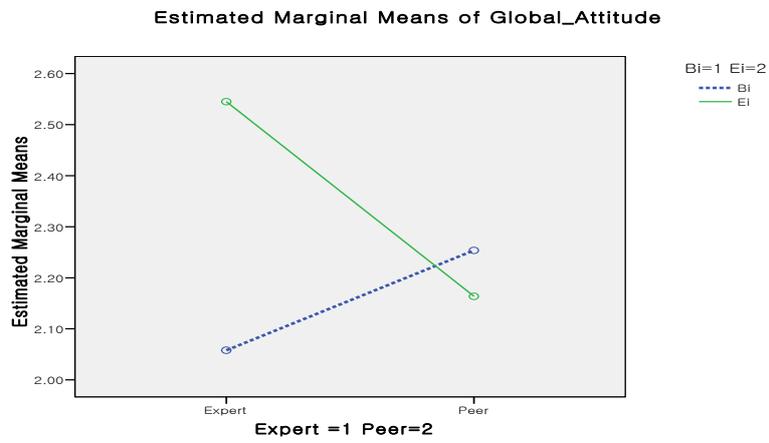


Figure 2. The Interaction Effect on Global Attitude.

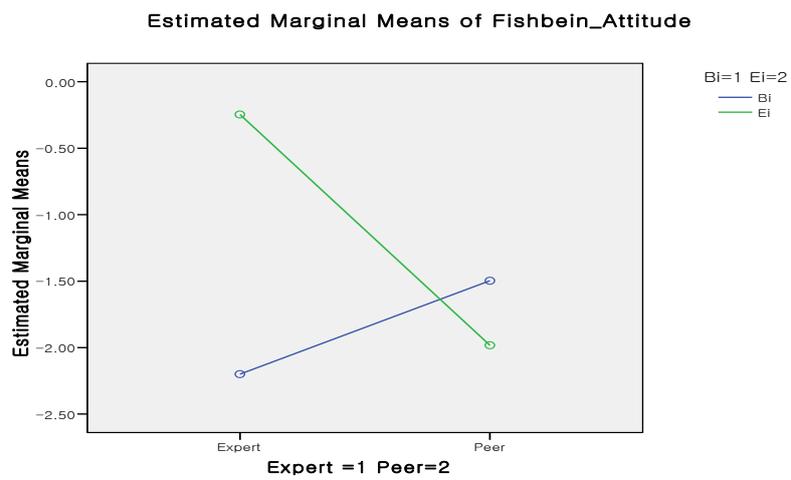


Figure 3. The Interaction Effect on Fishbein Attitude.

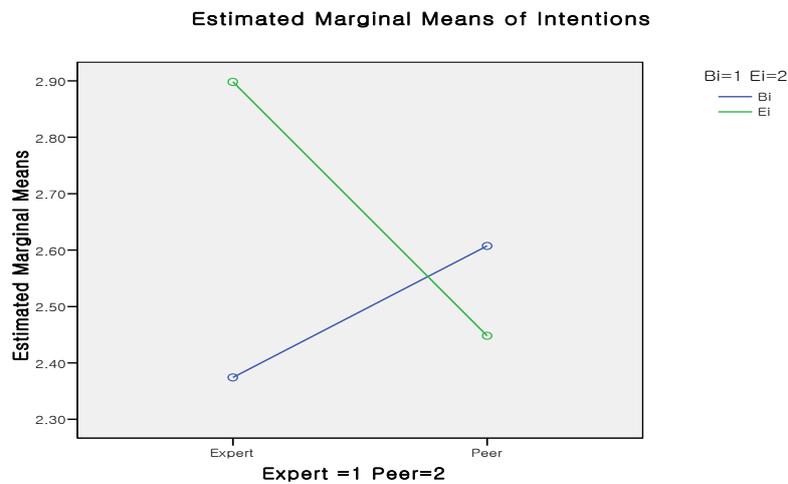


Figure 4. The Interaction Effect on Behavioral Intention

Correlation between global attitude and Fishbein's attitude

The zero-order correlation between global attitude and Fishbein's attitude was measured to examine possible redundancy of these two measures. The result revealed a positive correlation that [while significant, $p < .01$] indicated only a moderate effect size [$r = .56$]. Thus, the two measures were found not to be redundant and were treated as separate dependent variables in the multivariate analysis.

CHAPTER V

FINDINGS AND DISCUSSION

This chapter provides a summary of findings from this study, implications for health communication practitioners and researchers, limitations, and the direction of the future study.

In American college students, binge drinking trends show an increase in occurrences, creating concern for significant health and safety risk; therefore, determining how health practitioners can enhance the effectiveness of messages in PSAs regarding source and message variables is significant. The varying types of messengers and messages should be effective in efforts to change audiences as intended (Atkin, 1994). However, to date, there is very little theory and research to demonstrate either the relative effectiveness of the two messenger sources (expert versus peer) or the message appeals (belief message and evaluative message) and their interaction effects on college students' perceptions, such as attitudes toward anti-binge drinking PSA and attitudinal and behavioral changes related to binge drinking. While PSAs are one of the most frequently used methods in health campaigns (Dejong, 2002), the target group for these PSAs tend to exhibit few, if any, behavioral or attitudinal responses to the message content or appeal (Lynn, 1974, p. 623). Accordingly, this study was intended to examine the superiority and effectiveness of messenger sources (experts vs. peers) in terms of (a) "*who says*", (b) message

appeals (Bi vs. Ei) in terms of “*how tells*”, and (c) their interactions in terms of “*who tells how*.” The match-up hypothesis provided the theoretical foundation.

Summary of Findings

In comparing expert and peer messengers, a peer, perceived as having more similarity than an expert, was viewed effective more often than an expert in terms of giving a favorable attitude toward the PSA so long as the message quality was viewed equivalent across messages. In other words, this study supports the findings of empirical studies in which similar communicators are perceived as being more powerful than unlike ones (Feick & Higie, 1992), and in which young people acting as peer models in health campaigns are more significantly regarded, unlike conventional sources (Atkin, 1994). Even though no theory has been proposed to verify the superiority between similarity and expertise, from this study, it could be concluded that college students are likely to favor a similar messenger who might share the similar experiences and natural characteristics of young people, leading to favorable attitudes toward the anti-binge drinking PSA.

In terms of showing a favorable attitude toward the anti-binge drinking PSA, the interaction effects between sources and message appeals strengthen the superiority of peer as a messenger, which was a consistent result from the main effect for sources. In the interaction between sources and appeals, the Peer/Ei was favorable over an Expert/Ei (H2.b) and an Expert/Bi (RQ3). That is, in this study, even if college students perceived a match between expert and belief message appeals, they still tended to favor the PSA delivered by the peer, regardless of the message style. Also, they perceived a Peer/Bi combination (unmatched condition) had more positive attitude toward a PSA than Expert/Bi (matched situation).

These results strongly represent a tendency for young people to be more willing to be advised by a person similar to themselves.

However, based on the findings of main effect for sources, namely that there are no significant differences among other dependent variables (attitudinal and behavioral changes), it was determined that a similar messenger (a peer) played its partial role of making college students simply like the PSA. In other words, this one dimension of the source credibility, similarity (a peer in the PSA), was insufficient to generate differentiated effects in changing beliefs, attitudes, or behaviors (Pormpitakpan, 2004). Thus, whether the college students like or dislike the PSA, the message did not generate a change in their overall attitudes toward binge drinking and behavioral intentions. Though it would be possible for college students to react positively toward a certain PSA model and PSA, it would not necessarily mean that they are likely to be affected by the model or the PSA in terms of changing their attitudes and intentions to commit a certain behavior.

In terms of the effects of message appeals, the study found that there was no significant superiority between belief and evaluative appeals among all the dependent variables. One possible explanation for this result may be ascribed to the fact that the messages are solely designed to focus on both the negative outcomes and negative valences. The message content used in these message stimuli were based largely on fear-arousing content such as negative health threats and negative social threats. Regardless of likelihood or valence, it may be possible that the negatively-framed threats offset the effects of message appeals. However, more investigation should be made on the pure effect of message appeals.

Finally, in terms of attitude toward binge drinking and intention to binge drink, the results indicated that a Peer/Ei match yielded superiority in comparison with Expert/Ei (H2.b). These

results suggest that when it comes to evaluative appeals (focusing on the negative feeling of the bad outcomes), a peer model is a better match than an expert. Considering the manipulated source characteristics (peer-similarity), it might be possible that evaluative appeals enhance the effectiveness to some degree of the similarity factor of source credibility.

In terms of attitude toward binge drinking and intention to binge drink, the results exhibited that an Expert/Bi match generated significant superiority in comparison with Expert/Ei (H1.a). Similarly, this result supports the arguments of Salmon and Atkin (2003, p. 460) “ In belief-oriented messages (belief appeals), a medical authority is important because their expertise may enhance the believability of the messages when relating consequences.”

Overall, regardless of matches between sources and appeals (Expert/Bi and Peer/Ei), a peer was generally perceived as an influential messenger source in giving a favorable attitude toward anti-binge drinking PSAs. However, matches between sources and appeals (Expert/Bi and Peer/Ei) had different effects on changing attitude and behavior in binge drinking. Expert/Bi was viewed a good match rather than Expert/Ei, and Peer/Ei was observed a better fit than Expert/Ei. Finally, the order of relative effectiveness of a combination of sources and message is Expert/Bi, Peer/Ei, Expert/Ei, and Peer/Bi.

Discussion

Implications

When it comes to the question of which sources are more appropriate for which message types, the combination of Expert/Bi and Peer/Ei were perceived to be a strong match so long as the message has the same quality, while the least effect is Expert/Ei and moderate effective is Peer/Bi. These interaction findings provide evidence that effectiveness depends on the sources

being related to the message type. For PSA practitioners, the safest kind of message to deliver would be a belief message, if they are not sure whether the source would be perceived as an expert (expertise) or a peer (similarity). However, for a peer as messenger in a PSA evaluative appeals are marginally effective; and, as for an expert, belief appeals are dramatically more effective than evaluative appeals.

A peer was viewed as an effective messenger source in terms of giving a favorable attitude toward the PSA regardless of whether or not it was matched. This result gives a mere hint that using a peer model is beneficial for health campaign practitioners in that the campaign could attract the attention of young people. However, more importantly, allowing message recipients to have a favorable attitude toward a health campaign does not always yield what the campaign is intended to yield. Thus, the way to convey messages (*who tells how*) in the PSA is relatively more important than a mere fact of *who tells* in light of influencing attitudinal and behavioral changes. This finding gives a significant implication for PSA practitioners in that it would be meaningless if they merely try to find a better messenger source in PSAs. Therefore, in order to achieve the goal of a health campaign, practitioners should instead narrow down the possible matches between PSA models and what they are to convey.

In addition, this study gives an important clue that an attempt to build up a strong argument or high quality of a message is as important as to optimize the match between a source and message appeal. Both the credibility and quality of a message may be more powerful factors than would be a match between source and appeal.

Finally, the usage of the expectancy-value attitude model, relatively less used in health campaign areas, will be beneficial in exploring health attitudinal change more precisely. In this

study, the expectancy-value attitude yielded statistically similar results as the global attitude measure and even generated a higher F-value than the global attitude measure.

Also, a zero-order correlation between global attitude and Fishbein's attitude showed a moderate and positive relation. Fishbein (1974) predicts that global attitude equals to the sum of one's salient beliefs weighed by the evaluations of the beliefs. However, the observed moderate effect (not perfectly or highly correlated), explained that Fishbein's attitude was not, in fact, an equivalent measure to the global attitude. Thus, including the Fishbein's attitude in the dependent variate along with global attitude in this study was reasonable in that each measure was accessing different aspects of the attitude construct. It might be argued that there is an advantage to using Fishbein's attitude model for diagnosing message effects. For example, among a number of message claims, it would be possible to identify which claims "work," in terms of the level of belief and valence generated, and which ones do not.

What is more, in areas of social research dealing with sensitive issues such as substance abuse, participants in an experiment or survey tend to avoid revealing their true attitudes toward the issues. Thus, the global attitude measure, which simply asks, "Do you think smoking is beneficial?" might generate a biased feedback from participants due to their unwillingness to show their true emotions and beliefs. In contrast, the expectancy-value attitude model, where participants are enabled to specify their judgments toward the likelihood of the outcomes of doing the undesired behavior and to assess the valence of the outcomes, may yield less-biased feedback. Thus, regarding future study in the health communication area, this model should be applied and should also be expected to give PSA practitioners insight into the structure of the attitude (Wilkie & Pessemier, 1973).

Limitations and future study

For both academics and practitioners, knowing how effective mass-mediated health campaigns are in terms of changing health behavior and attitude is important (Snyder, 2001). Moreover, in day-to-day life, without change around them, individuals rarely change their personal behaviors (Hill, 2004). It is also true that drinking, including heavy drinking, is a social behavior embedded in communities and cultures. College students have a growing and higher rate of binge drinking and the context where they are currently involved will not easily change; determining how practitioners can enhance the effectiveness of PSAs remains significant.

There is still a need to continue investigating a variety of message appeals and sources. This study lacks in many ways in that, when applying the appeals, both the likelihood and valence should be reexamined by exploring negative and positive forms with proper proportions. It is acknowledged that fear-arousing appeals are relatively effective in changing health perceptions, but positive appeals might be an addition that would serve to encourage change by linking desired behavior with positive images (Atkin, 2001). Particularly, in this study, the message appeals (bi and ei) were mainly formed by negative outcomes and feelings regarding the appeals, which might obscure the pure effects message appeals themselves and not be over-linked to negativity. These careful examinations of sources and messages will allow us to have some degree of messenger source superiority beyond the shallow findings of this study that expertise tends to strengthen bi message while similarity creates a stronger ei message, if the messages have an equal level of perceived quality.

In this study, the evaluative appeals were prone to be perceived as weak, relative to belief appeals, because the evaluative appeals simply focused on the negative feelings of outcomes (ex: consider how devastating it is to have irreversible damage such as liver cancer)

without delivering substantiating evidences about how and why the outcomes occur. In a case of belief appeals, participants were provided some statistical data (8 times more likely to miss class and damage your academic career) and the links between the cause (if binge drinking happens repeatedly over enough time) and outcomes (your body will very likely suffer from irreversible damage such as liver cancer). Accordingly, there is a high possibility that subjects perceive the belief appeals as sound arguments that are more rational than they did the evaluative appeals. Future studies should more focus on making belief and evaluative appeals that exhibit equivalent substantiating supports in regard to the negative outcomes of binge drinking.

Also, the purpose of the present study examining anti-binge drinking PSAs was mainly to explore the effects of (a) sources, “who says”; (b) appeals, “how tells”; and (c) the interactions, “who tells how”. In other words, in this study, there was a lack of identifying which message claims delivered by sources worked or did not work in terms of “what tells”. As discussed in the implications section, it was suggested that using the Fishbein’s attitude model in a study of PSAs would be beneficial in diagnosing message effects. A possibility for further study will be to examine PSAs by discovering each claim’s effectiveness in attitudinal and behavioral changes in terms of the level of belief and valence generated. For, example, in terms of message effects, it would be possible to examine the differential effects of physical threats versus social threats or positive versus negative appeals. Also, regarding physical threats only, it is likely that the comparison of each effect between a short-term and long-term appeal on persuasion can be measured. Further, it will be meaningful to explore the differential effects of messages contingent upon sources.

In the present study, attitudinal changes were measured based on both global attitude and Fishbein’s expectancy-value theory. Particularly, a list of negative outcomes used in the message

were based on mainly physical threats and social threats; participants were asked to assess whether the listed consequences were a match with their own beliefs and evaluation in regard to after-binge drinking. However, it remains to be seen whether the messages adopted for the study were far away from their current salient beliefs. Ajzen and Fishbein (1975) stated different types of beliefs, such as primary beliefs, proximal beliefs, and target beliefs, and argued that it is possible to identify common prominent beliefs for a certain population (Ajzen & Fishbein, 1980). Cooper and Burgoon (2001, p. 230) indicated “identifying the salient beliefs associated with an attitude can provide valuable insight into behavioral determinants”, e.g, using open-ended questions (Ajzen & Fishbein, 1975).

In this study, it could be highly possible for participants to acknowledge that they will almost certainly have a hangover when they drink, that it's possible to vomit, and that it's somewhat possible they will blackout. Interestingly, people who binge drink are willing to deal with these opportunity costs in exchange for the social and professional benefits binge drinking offers. The argument that binge drinking hurts people academically could also be regarded as a difficult one to make, considering the number of successful binge drinkers in the world. Thus, future study may be required in order to detect college students' current and prevalent beliefs on negative outcomes of binge drinking. For example, the message should focus on the fact that unsuccessful binge drinkers suffer from poor self-control and foolish decisions in the short-term, leading to arrest, rape, and fatal accidents. Also, the message scenarios could be different based on the genders' perceived risks (ex: for female students : being raped, being pregnant by an unknown man; for male students: getting the girl pregnant, being charged with sexual assault).

Last but not least, what remains to be determined by future study is the involvement of gender as a variable in interpretation of the anti-alcohol message effects. Studies have reported

that not only are there different alcohol consumption patterns and motivations between females and males, (Andsager, Austin & Pinkleton, 2002; Schulenberg, Wadsworth, O'Malley, 1996; Bachman, & Johnston, 1996; Tinsley, Holtgrave, Reise, Erdley, & Cupp, 1995), but also there are different outcomes resulting from binge drinking: female students tend to become dizzy, being defenseless, while male students are associated with drunk driving issues (Parker, 1998). Moreover, males and females noted different persuasive values in alcohol-related PSAs (Andsager, Austin & Pinkleton, 2002), implying that it may be beneficial to incorporate gender in a future study on the message effects of PSA.

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APPENDICIES

APPENDIX A. QUESTIONNAIRES

APPENDIX B. STIMULI - PUBLIC SERVICE ANNOUNCEMENTS

APPENDIX C. TABLES

APPENDIX A
QUESTIONNAIRES

APPENDIX A-1. QUESTIONNAIRE FOR PRETEST

APPENDIX A-2. QUESTIONNAIRE FOR EXPERIMENT

APPENDIX A-1. Questionnaire for Pretest (For Messenger Source and Message Appeal Manipulation)

In this section, I'd like to get your opinion about an anti-binge drinking PSA (Radio transcript).
FIRST, PLEASE READ THE PSA CAREFULLY.

North Georgia Addiction Rehabilitation Center
"Toxic Campuses": 60 Radio

Doctor:

Hi, I'm Doctor Pat Michaels. I'm Director of the North Georgia Addiction Rehabilitation Center. So, I have many years of experience in the medical field. I am here to discuss the dangers of binge drinking. For men, 5 or more drinks in two hours and for women, 4 or more drinks in two hours is defined as binge drinking.

Doctor:

If you binge drink, you are likely to experience these symptoms related to binge drinking — vomiting, blackouts, and a pounding hangover the next day. If binge drinking happens repeatedly over enough time, your body will very likely suffer from irreversible damage such as liver cancer.

Doctor:

Other problems? You are 8 times more likely than non-binge drinkers to miss class and eventually damage your academic career. Binge drinking makes it more likely that you will lose family support or even your close friends

It may feel good to be the "life" of the party, but it is terrible to actually destroy your own life.

Doctor:

For more information, visit w-w-w-dot-binge-drinking-prevention-dot-o-r-g or call 1-800-300-2222. A public service message brought to you by the North Georgia Anti-Addiction Alliance.

**A different stimulus advertisement is placed in this page
(See APPENDIX B)**

Part 1. Please place an "X" in the space that indicates the extent to which you agree or disagree with each of the following statements regarding the PSA you just read. Use a 7-point scale where "1" means STRONGLY DISAGREE and "7" means STRONGLY AGREE.

		strongly disagree						strongly agree
A. I think that the messenger in the PSA is								
a)	similar to me	1	2	3	4	5	6	7
b)	similar to me in the way he/she thinks	1	2	3	4	5	6	7
c)	an expert	1	2	3	4	5	6	7
d)	experienced	1	2	3	4	5	6	7
e)	knowledgeable	1	2	3	4	5	6	7
f)	qualified	1	2	3	4	5	6	7
g)	skilled	1	2	3	4	5	6	7
h)	trustworthy	1	2	3	4	5	6	7
i)	believable	1	2	3	4	5	6	7
j)	credible	1	2	3	4	5	6	7

		strongly disagree						strongly agree
B. I think that the message in the PSA illustrates								
a)	the negative feeling of vomiting resulting from binge drinking	1	2	3	4	5	6	7
b)	the negative feeling of blackouts resulting from binge drinking	1	2	3	4	5	6	7
c)	the negative feeling of a pounding hangover resulting from binge drinking	1	2	3	4	5	6	7
d)	the negative feeling of liver cancer resulting from binge drinking	1	2	3	4	5	6	7
e)	I think that the messages in the PSA generally focus on the negative feelings of the physical harms resulting from binge drinking	1	2	3	4	5	6	7
f)	the negative feeling of missing class due to binge drinking	1	2	3	4	5	6	7
g)	the negative feeling of a damaged academic career due to binge drinking	1	2	3	4	5	6	7
h)	the negative feeling of losing close friends due to binge drinking	1	2	3	4	5	6	7
i)	the negative feeling of losing family support due to binge drinking	1	2	3	4	5	6	7
j)	I think that the messages in the PSA generally focus on the negative feelings of harmful social consequences that binge	1	2	3	4	5	6	7

- drinking lead towards
- k) I think that the messages in the PSA generally focus on the negative feelings resulting from binge drinking 1 2 3 4 5 6 7
- strongly disagree strongly agree
- C. I think that the **message** in the PSA illustrates
- a) the likelihood of vomiting resulting from binge drinking 1 2 3 4 5 6 7
- b) the likelihood of blackouts resulting from binge drinking 1 2 3 4 5 6 7
- c) the likelihood of a pounding hangover resulting from binge drinking 1 2 3 4 5 6 7
- d) the likelihood of liver cancer resulting from binge drinking 1 2 3 4 5 6 7
- e) I think that the messages in the PSA generally focus on the likelihood of negative physical results from binge drinking 1 2 3 4 5 6 7
- f) the likelihood of missing class due to binge drinking 1 2 3 4 5 6 7
- g) the likelihood of a damaged academic career due to binge drinking 1 2 3 4 5 6 7
- h) the likelihood of losing family support due to binge drinking 1 2 3 4 5 6 7
- i) the likelihood of losing close friends due to binge drinking 1 2 3 4 5 6 7
- j) I think that the messages in the PSA generally focus on the likelihood of negative social results from binge drinking 1 2 3 4 5 6 7
- k) I think that the messages in the PSA generally focus on the likelihood of negative outcomes of binge drinking 1 2 3 4 5 6 7

Part 2: Please place an "X" in the space which most closely corresponds to your opinion about the following questions regarding the PSA you just read.

1. To what extent do you believe the information in the PSA was..

- | | | strongly
disagree | | | | | | | strongly
agree |
|------------------|--|----------------------|---|---|---|---|---|---|-------------------|
| a) unbelievable | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | believable |
| b) Untrustworthy | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | trustworthy |
| c) not credible | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | credible |

2. After reading the anti-binge drinking PSA, I think that the message in the PSA is strong argument

- d) Strongly disagree 1 2 3 4 5 6 7 Strongly agree

3. Please list ideas, thoughts, or images that occurred to you as you were looking at the PSA, even if you think the radio PSA is totally irrelevant or silly.

THIS ENDS THE STUDY!
THANK YOU!

Please provide the information on the following page to receive extra credit! (We will remove the information after assigning the extra credit)

What is your full name? _____

What is your student ID number (LAST 10-digit number on your UGA card; NOT social security number)? _____

Which class do you want to get extra credit for? (SELECT ONLY ONE COURSE; there is alternative study available, which you should complete to receive extra credit for another class)

- a. ADPR 3130 (Wendy Macias)
- b. 5990 SEM IN AD/PR (Wendy Macias)
- c. ADPR 3130 (Spencer Tinkham)
- d. 5990 SEM IN AD/PR (Jooyoung Kim)
- e. ADPR 3110 (Hye-Jin Paek)
- f. ADPR 5920 (Polly Howes)
- g. ADPR 3130 (Hye-Jin Yoon)

APPENDIX A-2. Questionnaire for Experiment

I. THE FIRST QUESTIONS PERTAIN TO YOU and YOUR LIFESTYLE. Please check only one response for each of the following questions.

1. Your sex is:

- a. Male
- b. Female

2. What was your age on your last birthday? _____

3. What is your classification?

- a. Freshman
- b. Sophomore
- c. Junior
- d. Senior
- e. Grad/ professional
- f. Not seeking a degree
- g. Other (please specify) _____

4. Which on of these groups BEST describes you? (CHOOSE ONLY ONE ANSWER)

- a. American Indian/ Alaskan Native
- b. Hispanic
- c. Asian/Pacific Islander
- d. White (non-Hispanic)
- e. Black (non-Hispanic)
- f. Other (please specify) _____

5. To which religion do you belong?

- a. Protestant
- b. Catholic
- c. Jewish
- d. Muslim
- e. None
- f. Other (please specify) _____

6. How much influence would you say that your religion has on the things you do?

- a. no influence at all
- b. little influence
- c. average influence
- d. great influence
- e. guides everything I do (total influence)

7. What is your last year of education completed?

- a. High School Graduate

- b. Vocational/Trade School
- c. First year college
- d. Second year college
- e. Third year college
- f. Fourth year college
- g. Other (please explain) _____

8. Are you a member of a fraternity or sorority?

- a. No
- b. Yes

The following questions ask about how much you drink. A “drink” means any of the following:

- A 12-ounce can or bottle of beer
- A 4-ounce glass of wine
- A 12-ounce bottle or can of wine cooler
- A shot of liquor straight or in a mixed drink

9. Think back over the past few months; how many times did you have five or more drinks at a sitting?

- a. none
- b. once per week
- c. twice per week
- d. 3 to 5 times per week
- e. 6 to 9 times per week
- f. 10 or more times per week
- h. almost everyday

10. In the last two weeks, how many times have you had five or more drinks in a row?

- a. never
- b. once
- c. twice
- d. 3 to 5 times
- e. 6 to 9 times
- f. 10 or more times

11. In the last two weeks, on those occasions when you drank alcohol, how many drinks did you usually have?

- a. never
- b. 1 drink
- c. 2 drinks
- d. 3 drinks
- e. 4 drinks
- f. 5 drinks
- g. 6 drinks
- h. 7 drinks
- i. 8 drinks

j. 9 or more drinks

12. In the last two weeks, how often did you drink enough to get drunk? (By “drunk,” we mean unsteady, dizzy, or sick to your stomach)

- a. never
- b. once
- c. twice
- d. 3 to 5 times
- e. 6 to 9 times
- f. 10 or more times

13. Within the last school year, did any of the following occur as a consequence of your drinking?

- | | | | |
|----|-----------------------------|--------|---------|
| a. | vomiting | (0) No | (1) Yes |
| b. | blackouts | (0) No | (1) Yes |
| c. | a pounding hangover | (0) No | (1) Yes |
| d. | judgment impaired | (0) No | (1) Yes |
| e. | drunk driving | (0) No | (1) Yes |
| f. | put into the jail | (0) No | (1) Yes |
| g. | losing a driver’s license | (0) No | (1) Yes |
| h. | physical injury to yourself | (0) No | (1) Yes |
| i. | physical injury to others | (0) No | (1) Yes |
| j. | a lifelong disability | (0) No | (1) Yes |
| k. | liver cancer | (0) No | (1) Yes |
| l. | missing classes | (0) No | (1) Yes |
| m. | lower grades | (0) No | (1) Yes |
| n. | losing scholarships | (0) No | (1) Yes |
| o. | damaging property | (0) No | (1) Yes |
| p. | losing family support | (0) No | (1) Yes |
| q. | losing close friends | (0) No | (1) Yes |
| r. | damaging friendships | (0) No | (1) Yes |

14. How much do you agree or disagree with each of the following statements? Use a 7-point scale where “1” means STRONGLY DISAGREE and “7” means STRONGLY AGREE.

Strongly disagree: _____ : _____ : _____ : _____ : _____ : _____ : _____ : Strongly agree
 1 2 3 4 5 6 7

- a. Social drinking makes me fit in more easily
- b. Drinking can be helpful to my health
- c. I often have an alcoholic drink when a friend recommends it
- d. I have quit or have drunk less based on a friend’s recommendation
- e. I am used to accepting drinks when they are offered by friends
- f. I am very health conscious
- g. Drinking is an important issue to me
- h. Drinking alcohol is part of a college experience

- i. College students are expected to drink alcohol
- j. Drinking allows students to make friends
- k. Some amount of drinking keeps me healthy

15. How much do you agree or disagree with each of the following statements? Use a 7-point scale where "1" means STRONGLY DISAGREE and "7" means STRONGLY AGREE.

- | | strongly disagree | | | | | | strongly agree |
|--|-------------------|---|---|---|---|---|----------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| a. Public service announcements (PSAs) are realistic. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| b. Public service announcements draw my attention. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| c. Usually, a messenger (spokesperson) in a PSA is convincing. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| d. Usually, the message in a PSA is believable | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

17. Have you ever watched or saw anti-binge drinking PSAs?

- a. No
- b. Yes

18. Where (in what media) do you encounter anti-binge drinking PSAs most?

- a. none
- b. magazine
- c. radio
- d. TV
- e. Internet
- f. newspaper
- g. billboards
- h. others (Please specify) _____

19. What characteristics do you find most important in anti-binge drinking PSAs?

- a. informational content
- b. emotional (feeling) content
- c. humorous content
- d. explanation of physical threat
- e. stories based on personal experience
- f. others (please specify) _____

20. From whom do you want to hear advice about anti-binge drinking?

- a. doctor
- b. peer

- c. parents
- d. relatives
- e. teacher
- f. no one
- g. others_____

II. MESSAGE EVALUATION

In this section, I'd like to get your opinion about a specific anti-binge drinking PSA. FIRST, PLEASE READ THE PSA CAREFULLY.

**A stimulus advertisement
is placed in this page**

(See APPENDIX B)

Now, you have read the radio transcript PSA. Please continue the survey by going to section III of the questionnaire and answering the questions.

III. In this section, please place “X” in the space that indicates the extent to which you agree or disagree with each of the following statements regarding the PSA you just read using the following seven-point scales, where “1” means strongly disagree and “7” means strongly agree.

A. Please place an “X” in the space which most closely corresponds to your opinion regarding **messenger in the PSA** you just read.

After reading the anti-binge drinking PSA, I think that the messenger (spokesperson) in the PSA is :

a)	similar to me	1	2	3	4	5	6	7
b)	similar to me in the way he/she thinks	1	2	3	4	5	6	7
c)	similar to me in his/her values	1	2	3	4	5	6	7
d)	intellectually similar to me	1	2	3	4	5	6	7
e)	similar to me in his/her behaviors	1	2	3	4	5	6	7
f)	an expert	1	2	3	4	5	6	7
g)	experienced	1	2	3	4	5	6	7
h)	knowledgeable	1	2	3	4	5	6	7
i)	qualified	1	2	3	4	5	6	7
j)	skilled	1	2	3	4	5	6	7
k)	trustworthy	1	2	3	4	5	6	7
l)	believable	1	2	3	4	5	6	7
m)	credible	1	2	3	4	5	6	7
l)	someone I like	1	2	3	4	5	6	7

B. Please evaluate **the message in the PSA** using the following seven-point scales, where “1” means strongly disagree and “7” means strongly agree.

After reading the anti-binge drinking PSA, I think that the message in the PSA :

a)	is likable	strongly disagree	1	2	3	4	5	6	7	strongly agree
b)	is familiar	strongly disagree	1	2	3	4	5	6	7	strongly agree
c)	is similar to others I've seen	strongly disagree	1	2	3	4	5	6	7	strongly agree
d)	shows expertise	strongly disagree	1	2	3	4	5	6	7	strongly agree

e)	is knowledgeable	disagree strongly disagree	1	2	3	4	5	6	7	strongly agree
f)	is high quality	strongly disagree disagree	1	2	3	4	5	6	7	strongly agree
g)	is skillfully written	strongly disagree disagree	1	2	3	4	5	6	7	strongly agree
h)	is dependable	strongly disagree disagree	1	2	3	4	5	6	7	strongly agree
i)	is honest	strongly disagree disagree	1	2	3	4	5	6	7	strongly agree
j)	is reliable	strongly disagree disagree	1	2	3	4	5	6	7	strongly agree
k)	is sincere	strongly disagree disagree	1	2	3	4	5	6	7	strongly agree
l)	is trustworthy	strongly disagree disagree	1	2	3	4	5	6	7	strongly agree
m)	is persuasive	strongly disagree disagree	1	2	3	4	5	6	7	strongly agree
n)	is one that I like	strongly disagree disagree	1	2	3	4	5	6	7	strongly agree
o)	is attention-getting	strongly disagree disagree	1	2	3	4	5	6	7	strongly agree
p)	is interesting	strongly disagree disagree	1	2	3	4	5	6	7	strongly agree
q)	is good	strongly disagree disagree	1	2	3	4	5	6	7	strongly agree
r)	is favorable	strongly disagree disagree	1	2	3	4	5	6	7	strongly agree
s)	is pleasant	strongly disagree disagree	1	2	3	4	5	6	7	strongly agree
t)	is funny	strongly disagree disagree	1	2	3	4	5	6	7	strongly agree
u)	is exciting	strongly disagree disagree	1	2	3	4	5	6	7	strongly agree
v)	is enjoyable	strongly disagree disagree	1	2	3	4	5	6	7	strongly agree
w)	is believable	strongly disagree disagree	1	2	3	4	5	6	7	strongly agree
x)	is important	strongly disagree disagree	1	2	3	4	5	6	7	strongly agree
y)	is relevant to me	strongly disagree disagree	1	2	3	4	5	6	7	strongly agree
z)	Expresses my own opinions	strongly disagree disagree	1	2	3	4	5	6	7	strongly agree
aa)	is factual	strongly disagree	1	2	3	4	5	6	7	strongly agree

	disagree											
	strongly disagree	1	2	3	4	5	6	7	strongly agree			
bb) is accurate	disagree											
	strongly disagree	1	2	3	4	5	6	7	strongly agree			
cc) is frightening	disagree											
	strongly disagree	1	2	3	4	5	6	7	strongly agree			
dd) is disturbing	disagree											
	strongly disagree	1	2	3	4	5	6	7	strongly agree			
ee) is scary	disagree											
	strongly disagree	1	2	3	4	5	6	7	strongly agree			
ff) is a strong argument	disagree											
	strongly disagree	1	2	3	4	5	6	7	strongly agree			

C. Please evaluate the PSA using the following seven-point scales, where “1” means strongly disagree and “7” means strongly agree.

After reading the anti-binge drinking PSA, I think that *binge drinking* is :

a)	harmful	1	2	3	4	5	6	7	beneficial
b)	pleasant	1	2	3	4	5	6	7	unpleasant
d)	good	1	2	3	4	5	6	7	bad
d)	worthless	1	2	3	4	5	6	7	valuable
e)	enjoyable	1	2	3	4	5	6	7	unenjoyable

D. Please place an “X” in the space which most closely corresponds to your opinion regarding the PSA you just read.

After reading the anti-binge drinking PSA, I think :

a)	I intend to binge drink in the forthcoming month	Extremely unlikely	1	2	3	4	5	6	7	Extremely likely
b)	I will try not to binge drink in the forthcoming month	Definitely true	1	2	3	4	5	6	7	Definitely false
c)	I plan to binge drink in the forthcoming month	strongly disagree	1	2	3	4	5	6	7	strongly agree

E. Please place an “X” in the space which most closely corresponds to your opinion regarding the PSA you just read.

After reading the anti-binge drinking PSA, I think that the *messenger (spokesperson)* in the PSA and the message are :

- | | | | | | | | | | |
|----|----------------|---|---|---|---|---|---|---|------------|
| a) | Not compatible | 1 | 2 | 3 | 4 | 5 | 6 | 7 | compatible |
| b) | bad fit | 1 | 2 | 3 | 4 | 5 | 6 | 7 | good fit |
| c) | irrelevant | 1 | 2 | 3 | 4 | 5 | 6 | 7 | relevant |

F. Below, you will find certain things that have been traditionally associated with alcohol consumption. Please evaluate each of the items by placing an “X” in the space which most closely corresponds to your opinion about these things.

In general, I feel that :

- | | | | | | | | | | | |
|----|--|------------------|---|---|---|---|---|---|---|----------------|
| a) | vomiting is | extremely
bad | 1 | 2 | 3 | 4 | 5 | 6 | 7 | extremely good |
| b) | fitting in easily is | extremely
bad | 1 | 2 | 3 | 4 | 5 | 6 | 7 | extremely good |
| c) | blackouts is | extremely
bad | 1 | 2 | 3 | 4 | 5 | 6 | 7 | extremely good |
| d) | being more sociable is | extremely
bad | 1 | 2 | 3 | 4 | 5 | 6 | 7 | extremely good |
| e) | a pounding hangover is | extremely
bad | 1 | 2 | 3 | 4 | 5 | 6 | 7 | extremely good |
| f) | helping my health is | extremely
bad | 1 | 2 | 3 | 4 | 5 | 6 | 7 | extremely good |
| g) | liver cancer is | extremely
bad | 1 | 2 | 3 | 4 | 5 | 6 | 7 | extremely good |
| h) | improving friendships is | extremely
bad | 1 | 2 | 3 | 4 | 5 | 6 | 7 | extremely good |
| i) | missing class is | extremely
bad | 1 | 2 | 3 | 4 | 5 | 6 | 7 | extremely good |
| j) | being a part of the college
experience is | extremely
bad | 1 | 2 | 3 | 4 | 5 | 6 | 7 | extremely good |
| k) | damaging my academic
career is | extremely
bad | 1 | 2 | 3 | 4 | 5 | 6 | 7 | extremely good |
| l) | making friends is | extremely
bad | 1 | 2 | 3 | 4 | 5 | 6 | 7 | extremely good |
| m) | losing family support is | extremely
bad | 1 | 2 | 3 | 4 | 5 | 6 | 7 | extremely good |
| n) | keeping me healthy is | extremely
bad | 1 | 2 | 3 | 4 | 5 | 6 | 7 | extremely good |
| o) | being alienated from my | extremely | 1 | 2 | 3 | 4 | 5 | 6 | 7 | extremely good |

H: Please place an "X" in the space that indicates the extent to which you agree or disagree with each of the following regarding the PSA you just read.

After reading the anti-binge drinking PSA radio script, I feel that I could imagine a real radio PSA from the PSA I just read.

Strongly disagree: _____ : _____ : _____ : _____ : _____ : _____ : _____ : Strongly agree
1 2 3 4 5 6 7

Please list ideas, thoughts, or feelings that occurred to you as you were looking at the PSA.

THIS ENDS THE STUDY!
THANK YOU SO MUCH! ☺

APPENDIX B

STIMULI- PUBLIC SERVICE ANNOUNCEMENTS

- APPENDIX B-1. An Expert/Belief PSA**
- APPENDIX B-2. A Peer/Belief PSA**
- APPENDIX B-3. An Expert/Evaluative PSA**
- APPENDIX B-4. A Peer/Evaluative PSA**

APPENDIX B-1. A Radio Transcript PSA (Expert/Belief)

North Georgia Addiction Rehabilitation Center
“Toxic Campuses”: 60 Radio

Doctor:

Hi, I'm Doctor Pat Michaels. I'm Director of the North Georgia Addiction Rehabilitation Center. So, I have many years of experience in the medical field. I am here to discuss the dangers of binge drinking. For men, 5 or more drinks in two hours and for women, 4 or more drinks in two hours is defined as binge drinking.

Doctor:

If you binge drink, you are likely to experience these symptoms related to binge drinking — vomiting, blackouts, and a pounding hangover the next day. If binge drinking happens repeatedly over enough time, your body will very likely suffer from irreversible damage such as liver cancer.

Doctor:

Other problems? You are 8 times more likely than non-binge drinkers to miss class and eventually damage your academic career. Binge drinking makes it more likely that you will lose family support or even your close friends

It may feel good to be the “life” of the party, but it is terrible to actually destroy your own life.

Doctor:

For more information, visit w-w-w-dot-binge-drinking-prevention-dot-o-r-g or call 1-800-300-2222. A public service message brought to you by the North Georgia Anti-Addiction Alliance.

APPENDIX B-2. A Radio Transcript PSA (Peer/Belief)

Students Against Binge Drinking Association
“Toxic Campuses”: 60 Radio

UGA student:

Hi, I'm Pat Michaels. I'm a UGA undergraduate student. So, in many ways, I am just like you. I am here to discuss the dangers of binge drinking. For men, 5 or more drinks in two hours and for women, 4 or more drinks in two hours is defined as binge drinking.

UGA student:

If you binge drink, you are likely to experience these symptoms related to binge drinking — vomiting, blackouts, and a pounding hangover the next day. If binge drinking happens repeatedly over enough time, your body will very likely suffer from irreversible damage such as liver cancer.

UGA student:

Other problems? You are 8 times more likely than non-binge drinkers to miss class and eventually damage your academic career. Binge drinking makes it more likely that you will lose family support or even your close friends.

It may feel good to be the “life” of the party, but it is terrible to actually destroy your own life.

UGA student:

For more information, visit w-w-w-dot-binge-drinking-prevention-dot-o-r-g or call 1-800-300-2222. A public service message brought to you by the North Georgia Anti-Addiction Alliance.

APPENDIX B-3. A Radio Transcript PSA (Expert/Evaluative)

North Georgia Addiction Rehabilitation Center
“Toxic Campuses”: 60 Radio

Doctor:

Hi, I'm Doctor Pat Michaels. I'm Director of the North Georgia Addiction Rehabilitation Center. So, I have many years of experience in the medical field. I am here to discuss the dangers of binge drinking. For men, 5 or more drinks in two hours and for women, 4 or more drinks in two hours is defined as binge drinking.

Doctor:

Think about how bad it is to have vomiting, blackouts, and a pounding hangover. Consider how devastating it is to have irreversible damage such as liver cancer.

Doctor:

Other problems? Consider how terrible it is if missing classes damages your academic career in the end. Think about how bad it is to lose family support or to lose friends.

It may feel good to be the “life” of the party, but it is terrible to actually destroy your own life.

Doctor:

For more information, visit w-w-w-dot-binge-drinking-prevention-dot-o-r-g or call 1-800-300-2222. A public service message brought to you by the North Georgia Anti-Addiction Alliance.

APPENDIX B-4. A Radio Transcript PSA (Peer/Evaluative)

Students Against Binge Drinking Association
“Toxic Campuses”: 60 Radio

UGA student:

Hi, I'm Pat Michaels. I'm a UGA undergraduate student. So, in many ways, I am just like you. I am here to discuss the dangers of binge drinking. For men, 5 or more drinks in two hours and for women, 4 or more drinks in two hours is defined as binge drinking.

UGA student:

Think about how bad it is to have vomiting, blackouts, and a pounding hangover. Consider how devastating it is to have irreversible damage such as liver cancer.

UGA student:

Other problems? Consider how terrible it is if missing classes damages your academic career in the end. Think about how bad it is to lose family support or to lose friends.

It may feel good to be the “life” of the party, but it is terrible to actually destroy your own life.

UGA student:

For more information, visit w-w-w-dot-binge-drinking-prevention-dot-o-r-g or call 1-800-300-2222. A public service message brought to you by the North Georgia Anti-Addiction Alliance.

APPENDIX C. TABLES

Table 1

Independent Samples T-Tests: Manipulation Checks (Pretest)

Variable		N	Mean (max. =7)	SD	T-value
Expertise	expert	60	5.35	1.35	10.74***
	peer		3.67	1.11	
Similarity	expert	76	3.35	1.24	-3.31**
	peer		3.89	1.34	
Belief Appeal	belief	136	4.05	1.35	2.10*
	evaluative		3.68	1.45	

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$

Table 2

MANCOVA: Effects of Sources and Appeals on Dependent Variables

	Multivariate Effects		Univariate Effects			
	Wilks's λ	F (4, 240)	F (1, 243)			
			Attitude toward PSAs	Global Attitude toward binge drinking	Expectancy- value attitude toward binge drinking	Intention to binge drink
Covariate:						
Drinking pattern 1 (past)	0.94	3.73**	2.16	11.58 **	1.42	11.33 **
Drinking pattern 2 (recent)	0.89	7.38***	0.00	1.22	3.19	24.34 ***
Consequence of drinking	0.96	2.02	0.90	1.64	6.02 *	4.46 *
PSA quality	0.49	63.78***	255.38 ***	18.37 ***	13.55 ***	12.78 ***
Factors:						
Source (expert vs. peer)	0.95	3.49**	13.59 ***	0.55	1.09	0.33
Appeal (bi vs. ei)	0.99	0.89	0.01	2.64	2.29	0.99
Source x Appeal interaction	0.96	2.28*	1.93	5.61 **	6.39 **	3.50*

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$

Note. Reported significance levels are based on two-tailed tests with the exception of the significant interactions, which are interpreted as one-tailed tests of directional hypotheses [H1. and H2].

Table 3

Mean and Standard Deviation Values for the Dependent Measures within Each Experimental Condition and across Each Independent Variable

Experimental condition		Variable							
		Attitude toward PSAs		Global attitude toward binge drinking		Expectancy-value attitude toward binge drinking		Intention to binge drink	
		M	SD	M	SD	M	SD	M	SD
Source	Expert	3.91	1.16	2.3	1.17	-1.22	4.18	2.64	2.04
	Peer	4.30	1.17	2.21	1.06	-1.74	4.32	2.53	2.03
Message	Bi	4.11	1.11	2.16	1.13	-1.85	4.32	2.49	2.08
	Ei	4.10	1.22	2.35	1.09	-1.11	4.13	2.67	1.98
Interactions	Expert/Bi	3.99	1.16	2.06	1.09	-2.20	4.08	2.37	2.03
	Peer/Bi	4.24	1.06	2.25	1.17	-1.50	4.53	2.61	2.14
	Expert/Ei	3.83	1.17	2.55	1.21	-0.25	4.13	2.90	2.04
	Peer/Ei	4.37	1.29	2.16	0.94	-1.98	4.10	2.45	1.93

Note. Mean Value for the PSA score and Global attitude: 1 =strongly disagree, 7= strongly agree”. Mean Value for the Expectancy-value attitude: belief appeal, 1= extremely unlikely, 7= extremely likely and evaluative appeal, 1 = extremely bad, 7= extremely good. Recode: 1 to -3 and 7 to 3. Mean Value for the Intention to binge drink: 1 = extremely unlikely, definitely false, and strongly disagree, 7=extremely likely, definitely true and strongly agree.

Table 4

Interaction Hypotheses testing

	Mean Difference			
Hypothesis 1	Attitude toward PSAs	Global attitude toward binge drinking	Expectacny-value attitude toward binge drinking	Intention to binge drink
Expert/Bi - Expert/Ei	.16	-.49**	-1.95**	-.52*
Expert/Bi - Peer/Bi	-.25*	-.20	-.70	-.23
Hypothesis 2				
Peer/Ei - Expert/Ei	.14	-.09	-.49	-.16
Peer/Ei - Peer/Bi	.54***	-.38*	-1.74**	-.45*

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$

Note. All significance levels reported are based on one-tailed tests of directional hypotheses.

Regarding interpretation of all mean difference scores, a negative sign indicates that the second term in the difference score has a higher value than the first term in the algebraic expression, while a positive sign indicates that the first term in the expression has a higher value.

Thus, a positive sign for the mean difference for the PSA score indicates greater effectiveness of the first term [combination of source and appeal] in the algebraic expression, whereas for all the other dependent variables, a negative sign for the mean difference indicates greater effectiveness for the first combination. All hypotheses predicted greater effectiveness for the first combination of source and appeal represented in the difference scores above.

Table 5

Interaction Research Question testing

Research Question 3	Mean Difference [Estimated Marginal Means]			
	Attitude toward PSAs	Global attitude toward binge drinking	Expectacny-value attitude toward binge drinking	Intention to binge drink
Expert/Bi - PeerEi	-.38*	-.11	-.22	-.07

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$

Note. All significance levels reported are based on one-tailed tests of directional hypotheses.

Regarding interpretation of all mean difference scores, a negative sign indicates that the second term in the difference score has a higher value than the first term in the algebraic expression, while a positive sign indicates that the first term in the expression has a higher value. Thus, a positive sign for the mean difference for the PSA score indicates greater effectiveness of the first term [combination of source and appeal] in the algebraic expression, whereas for all the other dependent variables, a negative sign for the mean difference indicates greater effectiveness for the first combination. All hypotheses predicted greater effectiveness for the first combination of source and appeal represented in the difference scores above.