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EXAMINING QUANTITATIVE AND QUALITATIVE EVIDENCE IN PERCEPTION CHANGING MESSAGES: A STUDY OF SOCIAL NORMS MESSAGE EFFECTIVENESS

By

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ABSTRACT

EXAMINING QUANTITATIVE AND QUALITATIVE EVIDENCE IN PERCEPTION CHANGING MESSAGES: A STUDY OF SOCIAL NORMS MESSAGE EFFECTIVENESS

By

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One of the challenges that college campuses face is the harmful consequences of alcohol consumption by college students. To deal with this problem, university officials have implemented communication campaigns based on the social norms approach. Social norm campaigns are designed to provide information about the actual prevalence of drinking patterns and attitudes about alcohol consumption on campus. Such information is expected to correct misperceptions held by students about alcohol consumption behavior and attitude. While case studies have documented the impact of social norms campaigns, very little research has focused on the components of various social norms message strategies. The primary study examined the effectiveness of different types of evidence (quantitative statistics or qualitative testimonials) in message believability and altering student perceptions of peer attitudes about the acceptability of heavy drinking (injunctive norms). While messages containing both quantitative and qualitative evidence were found to be more believable than the control and qualitative evidence only condition, no differences were found across message type for perception change of injunctive norm beliefs.

Exploratory supplemental studies examined message believability of six different message components. A message citing evidence based on a moderately large sample

size was found to be more believable than a message citing an extremely large sample size. A two-sided message explicitly mentioning and refuting widely-held misperceptions was found to be more believable than a one-sided version simply stating factual social norms information. No significant differences were obtained in the believability of three other message variations: presentation of numerical data vs. verbal labels of normative information, positive vs. negative message frames, and specific vs. general attributions of testimonial evidence for norm claims. In addition, the quantitative vs. qualitative induction for injunctive norms in the primary study was replicated with descriptive norms; the two versions do not differ significantly.

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T.A.F.

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INTRODUCTION

A common perception of college life is that students drink alcohol frequently and drink beyond moderation, often getting intoxicated. College students, parents, community members, and future college students perceive that heavy drinking is a typical behavior on college campuses (Perkins & Berkowitz, 1986; Perkins, Meilman, Leichliter, Cashin, & Presley, 1999; Prentice & Miller, 1993; Sher, Bartholow, & Nanda, 2001). The belief is that many students drink to extreme levels, which exceed what would be considered healthy alcohol consumption.

Heavy alcohol consumption is problematic in many ways. Heavy drinking may lead to harmful consequences, such as alcohol poisoning, vandalism and property destruction, rioting, fighting, sexual abuse, unprotected sex, and drunk driving. To combat the adverse consequences of excessive alcohol consumption by the student body, college campuses have launched numerous persuasive campaigns.

Many public communication campaigns have been designed and implemented targeting campus-wide alcohol consumption. These communication campaigns are used to inform or persuade a target audience to ultimately alter their behavior regarding alcohol usage. The campaigns typically deliver the message with posters, flyers, and newspaper ads. The message provides information and incentives that would ideally lead the recipient to accept the proposition of the campaign. Example propositions have included alcohol abstinence, alcohol consumption moderation, the use of a designated driver, or self and other protective behaviors such as watching out for a friend or pacing drinks of alcohol.

CHAPTER 1

SOCIAL NORMS

The social norms approach is centered on the discovery that people misperceive the actual normative attitudes and behavior of similar others (Perkins & Berkowitz, 1986; Perkins et al., 1999; Prentice & Miller, 1993; Sher, Bartholow, & Nanda, 2001). College students overestimate the extent to which other students engage in heavy drinking on college campuses, and that students often overestimate the level of approval for risky drinking behavior and drunkenness. While the belief that most college students drink excessively is prevalent, such beliefs are a misperception of actual drinking behaviors (Perkins & Berkowitz, 1986). When students are asked to estimate the number of drinks students consume on an average night of partying, the figure is much higher than actual drinking behavior engaged in by students. These perceptions are proposed to lead to perceptions of normative expectations (perceptions of how peers wish one to act). Students are then motivated to act in accordance to the perceived normative expectations (Perkins, 1997; Perkins, 2002). Students who are moderate in their drinking behavior or prefer to abstain from drinking are predicted to feel internal pressure to act in accordance to the perceived expectations of their peer group. Also, those who may be more liberal in their drinking preferences may act upon consumption desires with relatively little fear of peer disapproval (Perkins, 2003). These liberal drinkers justify their risky drinking behavior by pointing out that everyone in college acts in the same way.

Based on the misperception findings, campaigners began to create intervention strategies that were designed to correct the perceptions of risky alcohol behavior and attitudes on campuses. Researchers at Northern Illinois University developed a

communication campaign designed to inform students about the accurate amount of alcohol consumption taking place on campus (Haines, 1996; Haines & Barker, 2003; Haines & Spear, 1996). Messages informed students about actual drinking norms regarding moderate drinking and protective behaviors to reduce alcohol related harm incidents. In a nine-year period, the perceptions of NIU students who engage in risky drinking fell from an average of 63% to an average of 33%. Self-reported excessive drinking behavior also fell from 45% to 25%, while self-report alcohol related injury decreased from 36% to 16%.

Over the years, the social norms approach has increased in popularity, and currently, 20% of campuses designing campaigns targeting alcohol consumption are using a social norms approach (Wechsler, Kelly, Weitzman, San Giovanni, & Seibring, 2000). Social norms campaigns and the ensuing literature have generated a body of research describing the successes of the social norms intervention approach (Haines & Spear, 1996; Haines, 1996; Johannessen, Collins, Mills-Nova, & Glider, 1999; Perkins, 2002; Perkins & Craig, 2002). While evidence supports a reduction in drinking behavior and alignment of peer perceptions to actual drinking behaviors after a social norms campaign, relatively little attention has been given to study systematically the effects of specific components of a social norms message.

Types of Norms

Misperceptions of campus-wide alcohol norms include both descriptive and injunctive norms. Descriptive norms serve as a description as to what is normal behavior (Cialdini, Reno, & Kallgren, 1990). Descriptive drinking norms are defined as "the perception of other's quantity and frequency of drinking in discrete drinking situations"

(Borsari & Carey, 2001; pp. 401-402). Such norms represent the behavior of others in regard to drinking amounts, how frequently they drink, and the normal consumption levels during a typical night out. Examples of a descriptive norms message could state that "Most students drink moderately" or "67% of students drink five or fewer." Injunctive norms are defined as "the perceptions of others' approval of drinking...and represent perceived moral rules of the peer group" (Borsari & Carey, 2001; p. 402). Cialdini, Reno, and Kallgren (1990) refer to injunctive norms as the 'ought to' norms, in that injunctive norms are the rules or beliefs of what is approved or disapproved behavior. The researchers continue that injunctive norms specify what ought to be done. Injunctive norms are perceptions of the attitudes that others hold toward the acceptability of a drinking behavior; whether they approve or disapprove of a specific behavior. An example of an injunctive norms message may state that "Most students feel that drinking five or fewer is acceptable." Both descriptive and injunctive norms are conceptually and motivationally distinct (Cialdini, Reno, & Kallgren, 1990).

Fediuk (2004) found that injunctive norms perceptions did impact behavior intentions (r = .50). Descriptive norm perceptions were found to have no significant impact on behavior intentions (r = .06). While most social norms campaigns generate descriptive norms messages (Borsari & Carey, 2001), injunctive norm perceptions may serve as a better target for perception correction since such beliefs were found to have a strong impact on behavior intentions toward alcohol consumption.

In order to make any causal claims to the effectiveness of the social norms approach, research must first show evidence that the message corrects misperceptions. In his experiment, Fediuk (2004) did not find that the presentation of social norms messages

targeting either injunctive or descriptive norms altered normative perception beliefs. Perceptions toward the message proposition are not altered with the simple presentation of information (Darley & Gross, 1983; Edwards & Smith, 1996; Kahneman & Tversky, 1973; Lord, Ross, & Lepper, 1979; Munro & Ditto, 1997; Nisbett, Crandall, & Reed, 1976). In fact, a large body of research exists examining the different ways, factors, and degree of effectiveness of varying persuasive messages and appeals (Chaiken, 1980; Hovland, Janis, & Kelley, 1953; McCroskey, 1969; McGuire, 2001; Petty & Cacioppo, 1986; Stiff, 1986). Social norms messages are persuasive messages. Social norm messages are designed to alter existing perceptions from the belief that most students engage in or approve of a behavior to most do not engage in or approve of such behaviors. If social norm message effectiveness is defined as the changing of existing perceptions, such that the perceptions toward the extent of risky drinking behavior or approval of such behavior on campus reflect reality more accurately, new questions arise as to what factors will improve message impact on perception change. As called for by Reinard (1988), research into message effectiveness should isolate the different types of evidence used and to distinguish the effects of each type of evidence.

The present study attempts to understand how presenting different types of evidence (qualitative or qualitative) affect student perceptions about peer behavior and the student's attitude toward the acceptability of heavy drinking. Injunctive norms were found to be more impactful on behavior intentions than descriptive norms (Fediuk, 2004). The primary study was a 2 (no quantitative evidence, quantitative evidence) X 2 (no qualitative evidence, qualitative evidence) design intended to alter perceptions of injunctive norms.

A series of exploratory supplemental studies were conducted to examine the believability of six approaches for presenting quantitative and qualitative evidence. The first supplemental study compared large versus moderate sample sizes from which the sample is drawn. The second supplemental study varied the degree of specificity of quantitative evidence (quantitative statistic compared to a verbal quantitative label). The third supplemental study used testimonials and examined the specificity of source attribution and its impact on message believability. The fourth supplemental study explored the relative believability of disapproval of unhealthy behavior versus approval of a healthy behavior. The final two supplemental studies focused on descriptive norms. The fifth supplemental study examined the impact of quantitative versus qualitative evidence on message believability. The sixth supplemental study compared a one-sided message with a two-sided refutational message acknowledging the discrepancy of expectations about student drinking patterns.

Message Effectiveness

Systematic study into the effectiveness of messages designed to correct misperceptions has been lacking (Fediuk, 2004). Perception correction messages have been created across many campuses in the United States, but relatively little has been done to conduct detailed analysis of the messages presented to correct misperceptions. The question is whether social norms messages do in fact correct normative perceptions. Since the message is the key component of the social norms campaign, it is vital to study the message characteristics and impact on recipients more thoroughly to better advance social norms campaigns as a legitimate intervention strategy.

To increase the likelihood that a message is accepted, the message presented needs be believable. Believability of a message grants the message legitimacy (Rosenthal, 1971). If the audience does not believe the claim or the evidence presented, perception change is most likely not going to occur. If a message is believable, then it is more likely that the message will be processed and accepted, and in turn, the recipients are more likely to be persuaded by the message (Rosenthal, 1971). One way to examine factors that would bolster beliefs in a claim is to focus on the evidence presented to support the claim of the message (Baesler & Burgoon, 1994).

Toulmin (1964) provides a framework for the analysis of persuasive arguments. Three primary components of the argument are the claim, data, and warrant. The claim is the persuasive proposal in the argument. In a descriptive social norms message, the claim can be that "Most students drink moderately or not at all." Data are the evidence offered to support the claim of the message. In the case of the social norms message, the evidence must support the notion that most students drink moderately or not at all. The data may be in the form of statistics or qualitative testimonials. Finally, the warrant is the statement that connects the data with the claim. In the social norms message, the warrant is implicit rather than explicitly expressed.

The current study focused on data presented in a social norms campaign to support the social norms claim. The basic claim is that most students engage in healthy drinking practices and approve of others engaging in healthy drinking practices. In other words, most students do not drink excessively. Evidence is then provided to support the claim. Recipients of a persuasive message judge the evidence, or data and warrant, presented in the message (Reynolds, 1987; Reynolds, 2002; Wood, Rhodes, & Biek,

1995). The presentation of evidence has been shown to impact persuasiveness (Allen & Burrell, 1992; Reinhard, 1988).

Evidence is defined as "data (facts or opinions) presented as proof for an assertion" (Reynolds, 2002, pg. 429). Two types of evidence are testimonial assertions and factual information (Reinard, 1988). Testimonials may consist of qualitative statements or stories which center around the claim. For instance, students may be quoted supporting the notion that they themselves do not drink excessively. The quotes may also state that they approve of healthy drinking behaviors and disapprove of excessive drinking or drinking to intoxication. These testimonials are based on single episodes rather than summative statistics. Quantitative evidence does consist of summative statistics, in that evidence is presented in an empirical format.

Evidence Type

For the purpose of the primary study, quantitative and qualitative evidence types are discussed. Quantitative evidence is information about an object, person, concept or summary statistical information of a numerical nature (Church & Wilbanks, 1986; Dickson, 1982; Kahneman & Tversky, 1973; Kazoleas, 1993). Summary statistical information is "information presented as a rate, frequency, proposition, percentage, probability, average, median, mode, or some other statistical parameter. Such expressions often involve the use of mathematical symbols, such as numeric rather than written figures, the percent sign, and use of the decimal point" (Dickson, 1982, p. 399). Social norms messages have typically provided claims and evidence of a quantitative nature. The message may contain a quantitative statistic, such as "67% of students" or a

quantitative label, such as "most" or "majority." The quantitative label is more ambiguous than the statistic, but the label still represents a summative quantity.

Qualitative evidence refers to evidence presented in a narrative fashion such as personal anecdotes, analogies, examples, and testimonies (Kazoleas, 1993). Testimonial assertions are qualitative in nature. The information presented is not in a summative form. Rather, the evidence consists of a small sample size, and may include only one case history or a series of cases (Dickson, 1982). In a social norms campaign, testimonials could indicate whether peers 'approve' or 'disapprove' of certain behaviors. A message may state that most students feel that others 'ought to' engage in healthy behavior or 'should not' engage in non-healthy behavior. For example, an injunctive norms message may include students expressing opinions that others ought not to drink excessively, or that they approve of students drinking moderately. A descriptive norms testimonial may have students stating that they drink moderately or that they do not drink excessively. The testimonials can be statements expressing the behavior or attitude of a peer group.

To date, no research has examined the evidence presented supporting a social norms message claim. Research into whether quantitative or qualitative evidence is more persuasive in general has produced inconsistent findings. In some studies, qualitative evidence has been found to be more persuasive than quantitative evidence (Borgida & Nisbett, 1977; Kahneman & Tversky, 1973; Nisbett & Borgida, 1975). Qualitative evidence has been found to be more vivid and memorable than quantitative evidence (Baesler & Burgoon, 1994). On the other hand, some studies have found that quantitative evidence is more persuasive than qualitative evidence (Allen & Preiss, 1997; Baesler & Burgoon, 1994; Dickson, 1982; Lindsey & Ah Yun, 2003; Reinard, 1988; Wells &

Harvey, 1977). In a meta-analysis, where the effect size of multiple studies is assessed, Allen and Preiss (1997) report an average correlation of .10 across 16 studies (N = 1836), where statistical information is more persuasive than qualitative information. Statistics are viewed as being obtained from some objective measure or study, as opposed to personal testimonials, which are statements by individuals who may be biased or not selected at random.

One explanation as to why quantitative evidence may be more persuasive than qualitative evidence is that quantitative evidence information is perceived to be verifiable, and thus more believable (Lindsey & Ah Yun, 2003; Rosenthal, 1971). Rosenthal (1971) considers a message verifiable if it is precise enough to be empirically testable. Message recipients who perceive that the evidence is verifiable may perform further investigation. It is not necessarily the case that the recipients would go out and verify the information. The key is that the message could be verified if one wishes to do so. If recipients view that the evidence can be tested in some objective manner, then they are more likely to believe the message. Such research opportunities may reduce perceptions that the evidence has been manipulated.

Evidence can vary in its specificity, or how specific the message represents the quantifiable evidence. Highly specific messages present more detailed information (Rosenthal, 1971) and are thus more verifiable. The recipient does not need to speculate or need to provide further cognitive efforts to understand the claim and evidence; the message provides a sufficient amount of information. For example, "Most students" is less specific than "67% of students." The word most can signify anywhere from 50.1% to 100%. Perceptions vary as to what figure would represent "most students." Such verbal

generality and ambiguity reduces the perception that one can accurately verify the evidence of the claim. Stating that 67% of some population engages in some behavior would be less exposed to multiple interpretations. The precise figure of 67% would be expected to be interpreted the same by most recipients.

Another term often used in social norms campaigns is 'moderately'. The precise meaning of moderate drinking behavior can be interpreted in many ways. For individuals who tend not to drink, an evening consuming 2 or fewer may be considered moderate (whether 2 evenings of alcohol consumption is moderate is open for debate), while a student who tends to drink a large amount of alcohol, an evening of moderate drinking may be limiting one's self to less than eight drinks. A more specific term would be to define the term moderate as consuming "five or fewer" alcoholic beverages when out partying.

In brief, social norms messages consist of claims indicating that most students drink moderately. Such a claim is counter to pre-existing perceptions. In order to present a persuasive argument, the claim needs backing evidence that supports the main claim. Evidence may consist of quantitative or qualitative data. The current research examined the impact evidence type has on message believability and whether perception differences are impacted by the different evidence types presented in the message.

CHAPTER 2

PRIMARY STUDY: EVIDENCE TYPES

Fediuk (2004) found that injunctive norms have a greater impact on behavior intentions than do descriptive norms perceptions. Injunctive norms encompass both perceptions of what behavior is seen to be appropriate, as well as the 'ought to' norms. Therefore, the primary study, as well as most of the supplemental studies, focuses on injunctive norms messages.

Messages targeting injunctive norms could provide evidence for the social norms claim with either qualitative or quantitative evidence. Statistics may report the proportion of students who hold the attitude or opinion that most students should drink moderately. For example, "67% of students report that others ought to drink five or fewer" or "most students report that other students ought to drink five or fewer when out partying." Such a message would be backed by the inclusion of some sample size, which indicates that the statistics are from a randomized, summary study. Testimonials, on the other hand, could be created using actual testimonials from students that would indicate students' attitudes toward excessive or healthy drinking behavior (approval or disapproval) as well as statements indicating what students feel others should do in regard to drinking behavior. Such evidence may or may not include sample size or any indication that the testimonials come from a larger study.

Messages may also contain no evidence supporting an assertion. Such lack of evidence has been found to be less impactful than messages that contain supportive evidence (Kazoleas, 1993; Lindsey & Ah Yun, 2003). Creating messages that claim that

most students drink moderately and provide no evidence to support this claim is expected to be less believable, and less impactful than messages that include supportive evidence. Students who hold high injunctive norms perceptions feel that most of their peers approve of drinking to riskier levels, while students who hold low injunctive norms perceptions feel that most of their peers do not approve of drinking to riskier levels.

H_1: Subjects exposed to injunctive norms messages containing supporting evidence will have lower perceptions of injunctive norms than subjects who are exposed to messages with no supporting evidence.

H_{1a}: Subjects exposed to injunctive norms messages containing supporting evidence will find the message more believable than subjects exposed to messages with no supporting evidence.

Allen & Preiss (1997) report that quantitative evidence is more persuasive than qualitative evidence. Baesler & Burgoon (1994) indicate that recipients of a message that provides statistics and a large sample size process the information heuristically rather than systematically. Social norms messages are designed to inform recipients of what the summative behaviors and attitudes existing on college campuses. Such summative messages composed of quantitative evidence are expected to be more impactful than messages containing non-summative qualitative testimonials.

H_2: Subjects exposed to injunctive norms messages containing quantitative data will have lower perceptions of injunctive norms than subjects who are exposed to messages containing qualitative testimonials.

H_{2a}: Subjects exposed to injunctive norms messages containing quantitative data will find the message more believable than subjects exposed to messages containing qualitative testimonials.

Messages containing both quantitative and qualitative evidence may increase believability and credibility to the social norm claim. The supporting evidence would consist of both the summative statistic as well as a few testimonials from students. Research examining the benefits of including both types of evidence is limited (Allen & Preiss, 1997), but recent research has examined the impact of doing so. For instance, Allen, et. al., (2000) found that the inclusion of both quantitative and qualitative information increased message persuasiveness more so than quantitative or qualitative evidence only messages.

H_3: Subjects exposed to injunctive norms messages containing both quantitative data and qualitative testimonials will have lower perceptions of injunctive norms than subjects who are exposed to messages containing only one type of evidence or no evidence.

H_{3a}: Subjects exposed to injunctive norms messages containing both quantitative data and qualitative testimonials will find the message more believable than subjects exposed to messages containing only one type of evidence or no evidence.

CHAPTER 3

SUPPLEMENTAL STUDIES

Supplemental studies were conducted to be exploratory in nature. The purpose is to identify ideas that are most promising and worth pursuing.

When presenting a message designed to alter pre-existing perceptions, evidence supporting the claim need to be seen as believable by the target audience. To further understanding of message features, it is necessary to examine which message features are seen to be believable. A series of studies to test different message features and the impact these features have on message believability were conducted. Supplemental studies A, B, C, and D targeted perceptions of injunctive norms. While targeting injunctive norms may be more effective (Fediuk, 2004), many current campaigns focus on descriptive norms. Therefore, the final two supplemental studies (supplemental studies E and F) targeted descriptive norms.

Supplemental Study A: Sample Size

Message recipients may process a message systematically or heuristically (Chaiken, 1980). While some recipients of a message will take time to consider the evidence presented, other recipients will process the evidence from some type of message cue. One such heuristic cue is the sample size of the study. Recipients of a message who judge the message's believability based on a cue such as sample size are reported to be processing the message using a sample size heuristic (Baesler & Burgoon, 1994; Lindsey & Ah Yun, 2003). Baesler & Burgoon (1994) indicate that recipients judge the message through a law of large numbers. Processing and judging evidence based on the

assumption that large numbers are more believable would indicate that recipients are processing the message heuristically. In brief, if the evidence or statistic used in the message is from a larger, summative study, then there is a greater likelihood of the information being viewed as more accurate. Therefore, using the sample size heuristic, evidence containing a larger sample size would be seen as more believable than evidence with a smaller or more moderate sample size.

H_4: Quantitative social norms messages targeting injunctive norm perceptions that indicate a large sample size will be seen as more believable than messages that report a more moderate sample size.

Supplemental Study B: Numerical Specificity

Evidence provided in support of a claim may vary in its specificity. The evidence may contain very specific numbers and figures or may present ambiguous labels or qualitative testimonials. Quantitative evidence may be further sub-divided into quantified statistics or verbal labels. Quantitative statistic evidence would be the most specific message possible. A quantitative statistic message may indicate that 67% of students drink 5 or fewer drinks when they party. Verbal labels may be less specific, less precise, and more ambiguous, but still suggest a summative statistic. The precise number of occurrences, however, is not presented. An example of a verbal label can be "most students drink moderately or not at all." To increase specificity and keep a message consistent, quantitative statistics contain numerical representations of both percentage and quantity of drinks consumed. Messages containing more specific evidence would be seen as more verifiable, and are expected to be more believable than more ambiguous messages.

H_5: Quantitative social norms messages targeting injunctive norm perceptions that use quantitative statistics will be seen as more believable than messages that use verbal labels.

Supplemental Study C: Testimonial Attribution

While summative statistics are gathered using a large body of a sampled population, qualitative testimonials represent the opinions of specific students. The presentation of testimonial evidence does not report results from a specific percentage of a population. Rather, the message provides specific quotes or testimonials from other students. For social norms messages to be effective, the recipient must perceive that the testimonials are representative of a larger body of students. The presentation of one testimonial may not lead the recipient to feel that the statement is representative of the student body. Instead, the testimonial could be interpreted as the opinion of one person. Therefore, multiple testimonials should be presented in the message.

Testimonials can be presented absent of any visually identifiable source. A simple list of quotations surrounding a group may be presented. The testimonials are not ascribed to any particular individual in the group, and may in fact come from some source outside of the pictured group. Testimonials may also accompany pictures of the source of the testimonial. The testimonial is ascribed to an individual, who may be accountable for what they say. Since the testimonial is linked to a sender, such messages may be perceived to be more believable. The message may be even more believable if the source and testimonial contain the name of the sender.

RQ_1: Do visually identifiable testimonials increase the believability of a social norms message targeting injunctive norms perceptions more so than testimonials that are not visually identifiable to a source?

Supplemental Study D: Disapproval of Unhealthy Behavior

Rather than threatening negative consequences due to high levels of alcohol consumption, social norms messages target healthy behaviors, or alcohol wellness (Haines & Barker, 2002; Perkins, 1997; Perkins, 2003). One assumption of the social norms approach is that people are motivated to partake in healthy behaviors. Providing data that shows that most university students do indeed engage in healthy behaviors or feel that such behaviors are appropriate are expected to relieve the individual from the pressures to enact unhealthy practices believed to be the campus norm, and thus allows students to engage in pre-existing healthy practices, such as abstinence or moderation.

Proponents of the social norms approach insist that a social norms message be phrased as a positive message (Perkins, 2002). Messages need to stress the healthy normative attitude or behavior rather than focus on negative consequences of engaging against the normative healthy behavior. While the belief is that positively framed messages will be more effective than negatively framed messages, evidence to support the claim is not evident. It is unknown as to how students would react to a message stating that most students engage in a healthy behavior or approve of healthy behavior compared to a message indicating most do not engage in unhealthy behavior and disapprove of those who do engage in such behavior.

RQ_2: When presenting a social norms message targeting injunctive norms, are messages claiming that peers approve of healthy behavior more believable than messages claiming that peers disapprove?

Supplemental Study E: Descriptive Norms and Evidence Types

While the primary study examined the impact of evidence type on injunctive norms messages, supplemental Study E examined whether qualitative or quantitative evidence is more believable when presented with a descriptive norms message. Descriptive norm messages target perceptions of the behavior of other students rather than the attitudes and approval of other students. Descriptive norms can be observed by students. Students do not necessarily need other students to tell them about their behaviors. One may go to the bar and see how many drinks are being consumed. Such observability may benefit from summative statistics reporting student drinking behaviors. Therefore, descriptive norms messages containing summative statistics, which are verifiable, are expected to be more believable than qualitative testimonials of student drinking behaviors.

H_6: Quantitative social norms messages targeting descriptive norm messages will be perceived to be more believable than messages providing qualitative testimonials.

Supplemental Study F: Two-Sided Refutational Message

College students hold preconceptions as to the amount of drinking and level of approval toward excessive drinking on campus. Recipients of the social norms message are provided with information which informs students that most students do not engage in excessive drinking. Social norms messages tend to offer one-sided messages and

assertions without providing reference to pre-existing beliefs. One approach to message construction is to mention the prevalent beliefs (counterarguments) and then to refute those beliefs. A social norms message may acknowledge that most people do in fact feel that most students engage in risky behavior. Following the statement, the message may present the factual message which provides information countering pre-existing beliefs.

Allen (1991) conducted a meta-analysis comparing the persuasiveness of one-sided and two-sided messages. One-sided messages only present one side of an argument, which tends to be favorable toward the message claim. Two-sided messages are messages that include opposing arguments (Allen, 1998). Results indicate that two-sided messages are more persuasive than one-sided messages, $r = .03$. However, two-sided messages can be separated into two-sided non-refutational and two-sided refutational messages (Allen, 1991). Non-refutational messages only offer counterarguments, but do not refute these arguments. Refutational messages mention the counterargument as well as refute, or provide evidence against, the counterargument. Allen (1991) found that two-sided refutational messages are more persuasive than one-sided messages ($r = .07$). Two sided non-refutational messages are less persuasive than a one-sided message ($r = -.09$).

Most social norms messages can be classified as one-sided messages. However, a two-sided refutational message may be seen as more believable than a one-sided message. A two-sided refutational message would include counterarguments and beliefs held by students. By acknowledging and presenting counterarguments in the social norms message, students may feel that the message is more believable. Lucas (1989) claims that communicators who use two-sided refutational messages are seen as more credible than communicators who do not acknowledge counterarguments. The rationalization for this is

that the speaker has taken counterarguments under consideration and is not just presenting one side of the discussion.

H_7: Two-sided refutational messages targeting descriptive norm perceptions will be rated as more believable than one-sided messages.

CHAPTER 4

METHOD

Participants

For the primary study, 230 students were recruited from communication courses at a large Midwestern university during the spring semester of 2004. Participants were randomly assigned to experimental conditions. Of the participants, 8% were freshmen, 25% sophomore, 36% juniors, and 31% seniors; 58% were female and 42% were male; 17% reported being involved in a Greek system (fraternity or sorority), 14% were active in organized athletics, 4% were honor's college students, and 16% report being members of religious institutions; 74% reported having seen some type of alcohol related message on campus, with a median of 5 messages viewed in the last year; 91% reported that they consume alcoholic beverages. Participants reported partying an average of two times a week, and consume on average 5.93 drinks when out partying.

For the supplemental studies, 102 students were recruited from communication courses during the 2004 summer session. Participants were randomly assigned to experimental conditions. Of the participants, 2% were freshmen, 8% sophomore, 24% juniors, and 66% seniors; 61% were female and 39% were male; 16% reported being involved in a Greek system (fraternity or sorority), 7% were active in organized athletics, 4% were honor's college students, and 18% report being members of a religious institution; 79% reported having seen some type of alcohol related message on campus, with a median of 5 messages viewed in the last year; 87% reported that they consume alcoholic beverages. Participants go out partying an average of three times a week, and consume on average 5.79 drinks when out partying.

Design

A 2 (quantitative evidence, no quantitative evidence) X 2 (qualitative evidence, no qualitative evidence) between-subjects factorial design was employed for the primary study. The dependent variables were message believability and post-message injunctive norm perceptions.

For the supplemental studies, the dependent variable was message believability. Supplemental studies A, B, C, and D targeted perceptions of injunctive norms. Supplemental study A used a 1 (injunctive norms message) X 2 (moderate one year sample size, large multi-year sample size) between subjects factorial design. Supplemental study B used a 1 (injunctive norms message) X 2 (quantitative statistic, quantitative label) between subjects factorial design. Supplemental study C used a 1(injunctive norms) X 3 (testimonials by aggregate group attribution, testimonials by individual attribution, testimonials by named individual attribution) between subjects factorial design. Supplemental study D used a 1 (injunctive norms) X 2 (approve, disapprove) between subjects factorial design. Supplemental studies E and F targeted descriptive norms perceptions. Supplemental study E used a 1 (descriptive norms message) X 2 (qualitative evidence, quantitative evidence) between subjects factorial design. Supplemental study F used a 1 (descriptive norms) X 2 (refutation, no refutation) between subjects factorial design.

Message Inductions

Primary Study. Participants received one of four messages. The message claim was that "Most MSU students approve of drinking moderately." Quantitative and/or qualitative evidence was provided for support. The no evidence control condition

contained the same main claim, but the supporting message simply reiterated the main claim rather than presenting quantitative or qualitative evidence (i.e., assertion alone). The quantitative evidence stated that "67%* of MSU students report holding the opinion that others ought to drink five or fewer when out partying." The asterisk guided the viewer to the bottom of the page, which reported the sample size of the study as well as a web page students may view for further details. The qualitative testimonials had a support tag line indicating that "MSU students express the opinion that others ought to follow the five or fewer guideline when out partying." Four testimonials were provided as support. The testimonials were created from an in-class exercise using undergraduate students at the University of Michigan. The message using both qualitative and quantitative evidence had a tag line stating that "67%* of MSU students express the opinion that others ought to drink five or fewer when out partying." Four testimonials were included. The asterisk guides the viewer to the bottom of the page, which reports the sample size of the study as well as a web page students may view for further details.

Supplemental Study A: Sample Size. Supplemental study A examined whether believability of a message varies due to sample size. Both messages contained the same quantitative evidence. The factor that varied was the sample size reported under the asterisk at the bottom of the page. One condition reported N = 1,005, while the other reported N = 5,005. The sample size of 1,005 was based on a one-year study. In order to attain a plausible sample size of 5,005, the message cites an ongoing study accumulating a sample over a five year period.

Supplemental Study B: Numerical Specificity. Supplemental study B examined the impact of message specificity versus verbal generality. Quantitative statistics (more

specific evidence) stated that "67% of MSU students* report holding the opinion that others ought to drink 5 or fewer when out partying" while the verbally general quantitative label indicated that "Most MSU students report holding the opinion that others ought to drink moderately when out partying."

Supplemental Study C: Testimonial Attributions. Supplemental study C examined the believability of visual attribution of testimonials to an individual or a group. The group message showed a group of four students and the four testimonials appearing on the message, but not visually linked to an individual. The individual message visually linked the testimonial to an individual. A variation of the message showed the individual testimonials visually linked to a named source.

Supplemental Study D: Disapproval of Unhealthy Behavior. Supplemental study D examined whether a message was more believable if framed in a positive approval or negative disapproval format. The claim was either "Most MSU students approve of drinking moderately" or "Most MSU students disapprove of drinking heavily." The approval message was that "67% of MSU students* approve of others drinking five or fewer when out partying." The disapproval message stated that "67% of MSU students* disapprove of others drinking more than five drinks when out partying."

Supplemental Study E: Descriptive Norms and Evidence Type. Supplemental study E examined the believability of quantitative or quantitative evidence supporting a descriptive norms message. Descriptive norms messages focus on student behaviors rather than attitudes. To alter message topics, the descriptive norms message used here provided a claim about the frequency of college students going out partying. The main claim indicated that "Most MSU students drink infrequently." The supporting qualitative

evidence indicated that "81% of MSU students* report drinking twice a week or less" and the qualitative evidence indicated that "MSU students report drinking twice a week or less" and contained four testimonials.

Supplemental Study F: Refutation Message. Supplemental Study F examined whether explicitly referring to student overestimation of college drinking was more persuasive than not providing such information. The message was a descriptive message about the frequency of student drinking. The claim was that "Most MSU students drink infrequently." The supporting claim read "Many MSU students overestimate how often other students go out drinking ... perhaps it's because some of their friends seem to drink frequently." The supporting evidence was quantitative, in that "The fact is that 81% of MSU students* go out drinking twice a week or less, according to data in a campus-wide alcohol survey."

Procedure

For the primary study, participants were randomly given a packet containing the consent form, message induction, and survey. Participants were asked to estimate the percentage of peers who approve of excessive alcohol consumption (pre-message induction injunctive norms). The reported figure served as a baseline for injunctive norm perceptions. Following the initial questions, participants were exposed to one of four injunctive norm message evidence types. Participants viewed either a message containing quantitative statistics, qualitative testimonials, both types of evidence, or no evidence. After viewing the message, participants answered questions about descriptive and injunctive norm beliefs, normative expectations, alcohol consumption intentions, personal approval of excessive alcohol consumption, the believability of the message,

and induction check questions. Following these questions, some general questions pertinent to formative evaluation were asked. Finally, demographic questions were asked. See Appendix A for messages and Appendix B for the questionnaire.

For the supplemental studies, a separate sample of participants received a packet containing the consent form, four message inductions, and survey. After each message, participants answered five items assessing message believability. One of three injunctive norm messages was received first by the participant: quantitative statistic with a moderate sample size (N = 1,005), quantitative statistic with a large sample size (N = 5,005), or a verbal label message (The word "most" rather than a quantitative statistic). The second message presented was an injunctive norms message providing testimonial evidence. One of three messages was received by the participant: group-attributed testimonials, individual-attributed testimonials, or named individual-attributed testimonials. The third message presented was a descriptive norms message about the frequency of drinking by students. One of three messages was received by the participant: Quantitative evidence, qualitative evidence, or a two-sided refutational message. The final message presented an injunctive norms message that indicated whether other students approved of moderate drinking or disapproved of excessive drinking. After all messages were viewed, demographic information was collected, as well as an open-ended question asking "What were some of the thoughts you had while viewing these messages?" See Appendix A for messages.

Instrumentation

Perceptions of Injunctive Norms. The primary study assessed perceptions of norms using two scaling methods developed by Fediuk (2004). To assess perceptions of

injunctive norms prior to message exposure, five percentage estimate questions were used to measure perceived injunctive norms regarding alcohol consumption as well as frequency of consumption events (See Appendix B for items). Attitudes toward alcohol consumption behaviors include excessive drinking, students getting drunk, drinking more than five alcoholic beverages, and frequently getting drunk. The five item scale was tested using confirmatory factor analysis. Item five ("What percentage of MSU students approve of their peers drinking 5 or fewer alcohol drinks when out partying?") was removed due to lack of internal validity. The final four item scale resulted in a Cronbach's alpha of .93. The mean percentage for perceptions of injunctive norms was that 58.44 % of other students approve of drinking above moderate levels, with a standard deviation of 22.10 % (See Table 1).

Post-message injunctive norms perceptions were assessed using five 5-point Likert items developed by Fediuk (2004). The five-item scale was tested using confirmatory factor analysis, which resulted in a Cronbach's alpha of .72, with a mean of 3.27 and a standard deviation of .74 (See Table 1).

Message Believability. Message believability was assessed using seven 5-point Likert items developed by Lindsey & Ah Yun (2003). One item was removed prior to the study due to lack of face validity: "I believe that the message has integrity." The 7-item scale was tested using confirmatory factor analysis. After removing two items: "The information presented in the message is credible" and "It is difficult to judge if the description of student opinions is representative of the typical MSU student"), the five item scale resulted in a Cronbach's alpha of .86, with a mean of 3.21 and a standard deviation of .80 (See Table 1).

For the supplemental studies, five items were used to assess believability. Two items from the primary study were removed: "I do not believe that the message is credible" and "The message is not very reliable." After statistical analysis, an additional item was removed ("It is difficult to judge if the description of student opinions is representative of the typical MSU student"). The four item scale across four belief measures resulted in Cronbach alphas ranging from .89 to .99.

Induction Check. Induction check measures were created for the current study. Five items were taken from Lindsey & Ah Yun (2004), which were used to measure verifiability. Quantitative evidence is more verifiable than qualitative evidence. Three more items were included that ask whether subjects felt that the message presented statistical representations of data or whether the message contained testimonials by other students. The 5-item scale was tested using confirmatory factor analysis, which resulted in a Cronbach's alpha of .83. The induction check for qualitative testimonials could not be subjected to a confirmatory factor analysis, since there were only three items. The three item scale for qualitative testimonials resulted in a Cronbach's alpha of .79.

CHAPTER 5

RESULTS

Induction Checks

Two induction checks were conducted to determine if qualitative or quantitative data were perceived in the messages. Messages containing quantitative evidence were perceived to contain more quantitative evidence ($M = 3.29$, $SD = .71$) than messages that did not contain quantitative information ($M = 2.72$, $SD = .89$), $F(1,229) = 29.05$, $p < .001$, $\eta^2 = .11$ (See Table 2). Messages containing qualitative testimonials were perceived as presenting more qualitative evidence ($M = 3.26$, $SD = .92$) than messages that did not contain qualitative testimonials ($M = 2.47$, $SD = .92$), $F(1,229) = 42.60$, $p < .001$, $\eta^2 = .16$ (See Table 3). The means are based on a 5-point Likert scale.

Primary Study

Hypotheses one, two and three predicted differences in injunctive norms perceptions across messages. The higher the injunctive norms perception, the more the subject believes that others approve of risky drinking, while lower injunctive norms perceptions reflect perceptions that their peers do not approve of risky drinking. The hypotheses were tested using a two-way ANOVA omnibus F-test (Quantitative, No Quantitative evidence X Qualitative, No Qualitative evidence). Similar to the results obtained by Fediuk (2004), no significant differences on perceptions of injunctive norms were observed. Perceptions of injunctive norms about drinking did not differ significantly across all four conditions, $F(1,229) = .85$, $p = .47$, $\eta^2 = .00$. Means are reported in Table 4. Prior perceptions were added to the model as a covariate. Prior perceptions were

significant predictors of post-message injunctive norms perceptions, F (1,229) = 50.22, p < .001, η^2 = .18.

Hypothesis one predicted that subjects exposed to messages targeting injunctive norms perceptions containing evidence would have lower perceptions of injunctive norms than subjects exposed to messages that do not contain supporting evidence. Hypothesis one was tested using a one-way ANOVA. Contrast coefficients were employed, where a contrast coefficient of -3 was assigned to the no evidence control condition, and +1 was assigned to the three remaining conditions. No significant difference was obtained between messages that contained supporting evidence and messages that did not provide supporting evidence, t (226) = -.38, p = .70, r = .03. Hypothesis two predicted that subjects exposed to messages containing quantitative evidence lower perceptions of injunctive norms than subjects exposed to messages containing no evidence or qualitative evidence. Hypothesis two was tested using a one-way ANOVA. Contrast coefficients were employed, where a contrast coefficient of +3 was assigned to the quantitative evidence condition, and -1 to the control, qualitative evidence condition, and the condition containing both types of evidence. No significant differences were found between messages containing quantitative evidence compared to messages with no quantitative evidence, t (226) = .76, p = .45, r = .05. Messages containing both types of evidence may confound the results of the analysis of hypothesis two, in that qualitative evidence is contained in the condition containing both types of evidence. Therefore, a second analysis was conducted. Contrast coefficients were employed, where a contrast coefficient of +2 was assigned to the quantitative evidence condition, -1 to the control and qualitative evidence condition, and a 0 to the condition containing both types of

evidence, since qualitative evidence is mixed with the quantitative evidence. No significant difference was obtained between messages that contained quantitative evidence and messages that did not contain quantitative evidence, t (226) = .24, p = .81, r = .02. Hypothesis three predicted that subjects exposed to messages containing both qualitative and quantitative evidence would have lower perceptions of injunctive norms than subjects exposed to messages that do not contain both types of supporting evidence. Hypothesis three was tested using a one-way ANOVA. Contrast coefficients were employed, where a contrast coefficient of +3 was assigned to the condition containing both types of evidence, and -1 was assigned to the remaining conditions. No significant difference was obtained between messages that contained both quantitative and qualitative evidence and messages that did not contain both types of evidence, t (226) = -1.57, p = .12, r = -.10. The results, while not significant, are contrary to expectations, in that the trend is that subjects exposed to messages containing both types of evidence held higher injunctive norms perceptions than subjects exposed to messages that do not contain both types of evidence.

Hypotheses 1a, 2a, and 3a predicted that evidence type would have an impact on the believability of a message. The hypotheses were tested using a two-way ANOVA omnibus F-test (See Table 5). The omnibus F-test resulted in a significant result, F (1,229) = 3.19, $p < .03$, $\eta^2 = .04$. Means are reported in Table 6.

Hypothesis 1_a predicted that messages targeting injunctive norms perceptions containing evidence would be more believable than messages that do not contain supporting evidence. Hypothesis 1_a was tested using a one-way ANOVA. Contrast coefficients were employed, where a contrast coefficient of -3 was assigned to the no

evidence control condition, and +1 was assigned to the three remaining conditions. No significant difference was obtained between messages that contained supporting evidence and messages that did not provide supporting evidence t (226) = 1.70, p = .09, r = .11. However, the results are trending toward the predicted direction. Such differences can be substantial for campaign developers. Hypothesis two predicted that messages containing quantitative evidence would be more believable than messages containing no evidence or qualitative evidence. Hypothesis 2_a was tested using a one-way ANOVA. Contrast coefficients were employed, where a contrast coefficient of +3 was assigned to the quantitative evidence condition, and -1 to the control, qualitative evidence condition, and the condition containing both types of evidence. A significant differences were obtained, messages containing quantitative evidence compared to messages with no quantitative evidence, t (226) = 2.95, $p < .01$, r = .19. Messages containing quantitative evidence were found to be more believable than messages that did not contain quantitative evidence. Messages containing both types of evidence may confound the results of the analysis of hypothesis two, in that qualitative evidence is contained in the condition containing both types of evidence. Therefore, a second analysis was conducted. Contrast coefficients were employed, where a contrast coefficient of +2 was assigned to the quantitative evidence condition, -1 to the control and qualitative evidence condition, and a 0 to the condition containing both types of evidence. No significant differences were found between messages containing quantitative evidence compared to messages with no quantitative evidence, t (226) = 1.87, p = .06, r = .12. However, the data was trending in the predicted direction, in that messages containing quantitative evidence were seen to be more believable than messages that did not contain quantitative evidence. Hypothesis

three predicted that messages containing both qualitative and quantitative evidence would be more believable than messages that do not contain both types of supporting evidence. Hypothesis 3_a was tested using a one-way ANOVA. Contrast coefficients were employed, where a contrast coefficient of +3 was assigned to the condition containing both types of evidence, and -1 was assigned to the remaining conditions. Messages that contain both quantitative and qualitative evidence was found to be more believable than messages that did not contain both types of evidence, t (226) = 2.47, $p < .02$, $r = .16$.

Message believability and injunctive norms perceptions were correlated, $r = -.17$, $p < .01$. It remains unclear whether subjects who perceived the message to be believable were more likely to alter their perceptions, or those with lower injunctive norms perceptions were more likely to believe the social norms message.

Supplemental Study A: Sample Size

Hypothesis four predicted that messages indicating larger sample sizes would be perceived as more believable than messages with a smaller sample size (sample size heuristic). A t-test was conducted to determine any differences. Contrary to expectations, messages that indicated a moderate sample size ($M = 3.20$, $SD = .97$) were perceived to be more credible than messages with a larger sample size ($M = 2.70$, $SD = .78$), t (65) = -2.29, $p < .03$, $r = -.27$. Hypothesis four received no support.

Supplemental Study B: Specificity

Hypothesis five predicted that messages using quantitative statistics would be seen as more believable than messages using verbal labels. A t-test was conducted to determine any differences. The quantitative label message was similar to the message containing a moderate sample size, so the comparison group was the moderate sample

size message. No significant difference was found for using a quantitative statistic message ($M = 3.20$, $SD = .97$) or a quantitative label message ($M = 2.95$, $SD = .81$), t (69) = 1.18, $p = .24$, $r = .14$. Hypothesis five received no support.

Supplemental Study C: Testimonial Attribution

Research question one asked whether visually identifiable testimonials increased the believability of a social norms message targeting injunctive norms perceptions more so than unattributed group testimonials. Three messages were developed varying in degree of testimonial attribution, where the message could be attributed to either a whole group, to an individual, or a named individual. A One-Way ANOVA was conducted to determine any differences. No significant differences were found, F (2, 100) = 1.73, p = .12. Testimonials attributed to a group ($M = 2.70$, $SD = .78$), specific individuals (M = 3.11, $SD = .96$), or named individuals ($M = 3.07$, $SD = .94$) did not alter perceptions of message believability.

An analysis was conducted combining the two messages attributed to individual members compared to the message with a group testimonial attribution. Contrast coefficients were employed, where a contrast coefficient of -2 was assigned to the group testimonial message, and +1 was assigned to the two individual attribution group messages. The message with individually attributable testimonials was more believable than messages without attributable testimonials, t (98) = 2.05, $p < .05$, $r = .20$.

Supplemental Study D: Approval or Disapproval

Research question two tested whether a message indicating approval or disapproval of an action would be seen as more believable. A t-test was conducted to determine any differences. A disapproval message ($M = 3.04$, $SD = .91$) did not differ

significantly from an approval message for message believability ($M = 3.09$, $SD = .91$), t (99) = .29, $p = .77$, $r = .03$.

Supplemental Study E: Descriptive Norms and Evidence Types

While the main study examined the impact of evidence type on injunctive norms perceptions, hypothesis six examined whether quantitative or qualitative messages would be seen as more believable in a descriptive norms message targeting partying frequency. A t-test was conducted to determine if any differences were obtained for message believability. Messages featuring quantitative evidence ($M = 2.88$, $SD = .99$) did not significantly differ in message believability from messages presenting qualitative testimonials ($M = 2.95$, $SD = 1.10$), t (68) = -.306, $p = .746$, $r = .04$. When targeting descriptive norms of partying frequency, the type of evidence did not impact message believability. Hypothesis six received no support.

Supplemental Study F: Two-Sided Refutational Message

Hypothesis seven predicted that a two-sided refutational message would be more believable than a one-sided message. Since the two-sided message includes quantitative evidence targeting descriptive norms, the two-sided refutational message was compared to the quantitative descriptive norms message. A t-test was conducted to determine any differences. The two-sided refutational message ($M = 3.45$, $SD = .99$) was found to be more believable than the message that does not contain a two-sided refutational message ($M = 2.88$, $SD = .99$), t (62) = 2.36, $p < .03$, $r = .29$. Hypothesis six was supported.

CHAPTER 6

DISCUSSION

The current series of studies examined how the presentation of different types of evidence (quantitative or qualitative) affect message believability, perceptions of student behaviors and perceptions of student attitudes. The primary study examined the effects of quantitative and qualitative evidence, and supplemental studies focused on message components such as sample size, testimonial attributions, two-sided refutational messages, and approval/disapproval terminology.

The primary study tested evidence type on injunctive norm perceptions. Message believability is crucial to altering student perceptions of injunctive norms. Qualitative testimonials were not found to differ in believability compared to the control message containing only the claim with no supporting evidence. Quantitative messages, while not statistically different, did tend to be more believable than messages containing qualitative testimonials. Combining both qualitative testimonials and summative statistics was found to be more believable than the control message or messages containing only testimonials. These results suggest that quantitative evidence is more believable than no evidence or qualitative evidence only when presenting social norms claims. Such results are significant in that persuasive messages must be seen to be believable.

It was expected that subjects exposed to messages that included evidence to support a claim would have lower perceptions of injunctive norms than subjects exposed to messages that did not contain evidence. Subjects exposed to messages that contained quantitative evidence were predicted to have lower injunctive norms perceptions than subjects exposed to qualitative evidence, and subjects exposed to messages containing

both quantitative and qualitative evidence were expected to have the lowest injunctive norms perceptions. The results did not support the predictions. No significant differences were found across the four message types in regard to perceptions of injunctive norms. The majority of subjects did perceive that most students engage in and approve of higher levels of drinking. On average, students perceived that 55% of students approve of excessive drinking. The reported figure in the message was that 67% report holding the opinion that others should drink five or fewer. Thus, the social norms message presented was counter to pre-existing beliefs held by the subjects.

One explanation for the lack of differences in injunctive norms perceptions due to message exposure is that people are not impacted by a single message exposure, especially if the message is counter to existing beliefs. One exposure to a message that contradicts pre-existing perceptions may have little utility. Often, multiple exposures are necessary.

Another possible explanation for the lack of results is that subjects do not feel that the majority of students represent their immediate peer environment. While the majority may engage in and hold moderate attitudes toward alcohol, subjects may instead interpret the message through their experiences with their immediate peer groups. Prior research on evidence suggests that people tend to process messages in a way that disconfirms presented evidence (Darley & Gross, 1983; Edwards & Smith, 1996; Kahneman & Tversky, 1973; Lord, Ross, & Lepper, 1979; Munro & Ditto, 1997; Nisbett, Crandall, & Reed, 1976). When presented with evidence that is not consistent with one's beliefs, processing by subjects may not necessarily have been an objective examination of the message evidence. Rather, the subject may have generated counterarguments to

disconfirm the presented evidence. Students may thus feel that the information provided is inaccurate.

Fediuk (2004) found that many subjects questioned the validity of the claims and evidence presented in a social norms message. Open-ended responses for the current study also indicated doubts from a number of subjects. Students may question the spokespersons in the message, cast doubt to the survey methodology, insist that there is response bias, or may indicate that the sample does not represent their immediate peer group. Research needs to continue focus on what students feel is believable and credible information.

In open-ended responses, some students reported that their responses to the questionnaire were influenced by their immediate peer group rather than the message reference group. The implication is that subjects may perceive a difference between majority beliefs and immediate peer beliefs. Perhaps the majority do hold moderate attitudes, but their immediate peer group is their primary referent group. Additional questions in the questionnaire addressing how one's peer group differs from the majority of campus students would be beneficial. For example, questions may ask for approval rates for the entire student body, as well as for one's immediate peers. Deviations can then be observed.

Results of the primary study indicate that subjects who felt the messages were believable also had lower perceptions of injunctive norms. However, it may be the case that subjects who already have low injunctive norm perceptions may find a message that is similar to their own perceptions more believable. Subjects who hold high injunctive norms perceptions may discredit information that counters their own current perceptions.

But the argument that subjects who perceive a message to be believable are then persuaded to lower their perceptions of injunctive norms makes intuitive sense. Future research should continue focus on message believability and perception change, and how to best create believable social norm messages.

Supplemental Studies

A series of supplemental studies were conducted examining message variables. The supplemental studies offered a brief glimpse into message believability. Message variables were tested using messages targeting both injunctive norms and descriptive norms.

Contrary to expectations, a moderate sample size was found to be significantly more believable than a larger sample size and time period. Based on the sample size heuristic (Baesler & Burgoon, 1994), a larger sample size was predicted to be more believable than a smaller sample size. It is possible that subjects did not focus on the sample size message, as no induction check was included. The sample size was placed at the bottom of the message, and was not highlighted. However, such lack of attention would not explain the significant contrary difference obtained.

One possible explanation is that the ongoing time period may encompass a time period that the subject may feel was before their time at the university. The time frame presented was over a five-year period (1998-2002). In these years, the university has experienced a number of riots and stories of alcohol abuse in the media. Many participants have been at the university for four years or less. The thought process may be that the data may have been accurate prior to their own university attendance, but things are different now. Perhaps the participant feels that the drinking level is trending toward

greater tolerance toward alcohol consumption, and these changes are not captured in a larger time period. The one-year moderate sample size was conducted in a time period not far removed from the present year (2002). One possible solution is to have a larger sample size from a one-year collection period.

Messages that were more specific were not found to be more believable than messages that were more abstract. High exact percentages were not seen to be more believable than indicating that verbal labels indicating that most ought to drink moderately. However, the mean differences were trending in the predicted direction that more specific messages are seen to be more believable. The lack of power in the supplemental studies reduces the likelihood of obtaining significant results.

If there genuinely is no benefit to using a quantitative statistic over quantitative labels, practitioners may use strategic ambiguity to their advantage. Rather than reporting a specific statistic that requires detailed baseline studies, practitioners may simply state that most students engage in or approve in healthy behaviors. The word 'most' could encompass any number from 51% to 100%. Also, the lack of specificity removes the problem of whether students perceive that 57%, 67%, 77%, or 87% is a meaningful number that would induce behavior or attitude change.

Also unclear is if a believable quantitative statistic is indeed advantageous to social norms claims. A percentage closer to the student perception would be more believable than one that is distant from the student perception. For example, a message indicating that 55% of students drink moderately, which is closer to the perceptions held by the student, may be more believable than stating that 80% of students drink moderately. However, the lower percentage, while more believable, may not lead the

recipient to feel that the moderate behavior is normative. Further research is warranted to examine if the pursuit of believable quantitative statistics does not also reduce the potential for persuasion.

Supplemental studies were designed to test the utility of using testimonial messages. Testimonial messages that were visually identifiable to an individual were more believable than testimonial messages attributed to a larger group, with no visual attribution to an individual. Testimonials may however have little utility, as each testimonial needs to be thoroughly tested, and meaning may differ between different peer groups. What may be motivating for one peer group may be humorous to another peer group. Adding testimonials does not seem to have a strong impact, and the effort in constructing quality testimonials may be of limited pragmatic usefulness. Further research to examine if there is any utility in adding student testimonials is warranted.

Social norms proponents advocate the usage of positive message frames rather than negative message frames toward health or social benefits. The argument would be that using approval messages will be more beneficial than using disapproval messages. No significant differences were obtained in framing a message positively or negatively. Messages framing the claim in a way that expresses that other students approve of a healthy behavior did not differ from a message stating that other students disapprove of an unhealthy behavior. One explanation for the lack of findings could be due to a weak manipulation of the overall message. Another possible explanation is that the supplemental study had a small sample size, which limits the power to detect significant differences. Further examination is needed to examine whether a positive incentive such as being part of the crowd is greater than the incentive of not being a deviant.

The benefits of qualitative and quantitative evidence were examined using a descriptive norms message. The message targeted partying frequency rather than drinking quantity. No significant differences in believability were found between the two evidence types. These findings are limited, in that the message was targeting frequency rather than quantity. It is possible that frequency norms are irrelevant, while quantity norms may be more impactful. However, Fediuk (2004) found that descriptive norms have limited impact on behavior intentions.

The message may have also suffered in that the quantitative evidence reported that 81% of students report drinking twice a week or less. Based on the current study, only 70% report drinking twice a week or less. The evidence provided in the message may be overstated. The overestimation may have cast doubts on the believability of the message.

A two-sided refutational message was found to be more believable than one-sided messages. Taking into consideration and explicitly stating existing perceptions and counter-arguments may be more effective than just presenting factual information. Few social norms messages include counterarguments or acknowledgement of current student perceptions, even though evidence points to such misperceptions. Explicitly stating and contesting the misperception appears to be more believable than just stating facts that are counter to existing beliefs.

The benefits of using two-sided refutational messages for social norms campaigns need to be further examined. Social norm messages can present different sets of counterarguments with different sets of refutations. A series of point-counterpoint ads can be created. Such features can be presented in multiple messages and appear to be more

beneficial than just presenting the same factual information with different visual designs. Some subjects indicated that 1,000 subjects was not enough to gauge student attitudes on campus. Two-sided refutational messages may also target the lack of understanding of statistics and sampling error.

The challenge continues to be to create believable messages to alter injunctive norms perceptions. Practical challenges are to create believable messages to alter student perceptions. Based upon the current study, practitioners are encouraged to provide plausible quantitative evidence to support the main claim. The time period of data collection should be close to the time period of the statistical evidence presented. Finally, explicit presentation of counterarguments, followed by factual refutation should produce greater perceptions of message believability.

Limitations

One main limitation of the current study concerns the supplemental studies. The supplemental studies were designed to be exploratory in order to assess potential avenues of investigation. Sample size for these studies was relatively low, which reduces power to detect any significant differences. Each of the ideas presented in the supplemental studies warrant greater attention. The current study only focused on message believability. Future studies could take each supplemental study and further explicate the ideas and provide more stringent tests while also examining each factor's effect on message persuasiveness.

Another limitation is in the graphical presentation of the social norms message. While the images presented were taken from existing university campaign material, further formative development would add to the understanding of the entire message.

Many graphical variables and evaluations may have acted as confounds to understanding the impact of the different types of evidence presented. Perhaps the subjects focused more on the graphical layout and presentation rather than the text which provided the message. While the graphical presentation remained fairly consistent across the conditions, differences in spacing and openness were necessary to differentiate the statistical evidence and the testimonials. The quantitative messages had much more white space than did the testimonials, which tended to clutter the overall image.

Message inductions for the primary study were not very strong. While both induction checks were significant, the overall means suggest that respondents still perceived quantitative evidence in the qualitative evidence condition and vice versa. The mean difference obtained was not as strong as one would expect.

Another limitation is that the current study did not include any measure to assess argument strength. Unknown is whether subjects perceived the argument strength of the testimonial message the same way subjects perceived the quantitative evidence. Future studies should include a measure to examine perceptions of argument strength. Without such measures, comparisons of effect size between evidence type is suspect.

Future Directions

The social norms messages provide evidence that most students drink moderately or not at all. Future research should examine whether any unintended consequences arise from the social norms approach. The results of the current study suggest that little actual perception change is occurring due to social norms messages. However, researchers and practitioners have not yet begun focused study on the question if any negative adverse effects are created by the social norms campaigns.

Further efforts should also examine whether implicit or explicit statements of what actions are desired through the campaign are needed. Social norms messages tend to implicitly indicate that since most students drink moderately or not at all, so should the recipient of the message. The effects of explicitly telling students that they should not drink excessively should be tested. Explicit statements may be even more persuasive if accompanied by a two-sided refutational message.

Table 1

Means and Standard Deviations for Primary Study

Variable	M	SD	Range
Injunctive Norms Perceptions			
Pre-exposure percentage	58.44%	22.10%	3% - 95%
Post-message perceptions	3.27	.74	1 - 5
Message Believability	3.21	.80	1 - 5

Table 2

Analysis of Variance for Message Verifiability

Source	*Type III SS*	*df*	*MS*	*F*	*P*	η^2
Quantitative Evidence	18.82	1	18.82	29.05	<.001	.11
Qualitative Evidence	.00	1	.00	.08	>.05	.00
Quant x Qual	.83	1	.83	1.28	> .05	.00
Error	146.40	226	.65			
Total	166.05	229				

Table 3

Analysis of Variance for Testimonials

Source	*Type III SS*	*df*	*MS*	*F*	*p*	η^2
Quantitative Evidence	.59	1	.59	.69	>.05	.00
Qualitative Evidence	36.18	1	36.18	42.60	<.001	.16
Quant x Qual	.76	1	.76	.89	> .05	.00
Error	191.90	226	.85			
Total	228.84	229				

Table 4

Means and Standard Deviations for Drinking Injunctive Norm Perceptions

	Qualitative Evidence			
	No		Yes	
Quantitative Evidence	*M*	*SD*	*M*	*SD*
No	3.30	.70	3.30	.74
Yes	3.33	.54	3.15	.72

* $p < .05$

Note: Means are based on a 5-point Likert scale

Table 5

Analysis of Variance for Message Believability

Source	*Type III SS*	*df*	*MS*	*F*	*p*	η^2
Quantitative Evidence	5.47	1	5.47	8.70	<.001	.04
Qualitative Evidence	.27	1	.27	.44	>.05	.00
Quant x Qual	.27	1	.27	.44	> .05	.00
Error	142.17	226	.63			
Total	148.18	229				

Table 6

Means and Standard for Perceived Message Believability

	Qualitative Evidence			
	No		Yes	
Quantitative Evidence	*M*	*SD*	*M*	*SD*
No	3.06[a]	.81	3.06[a]	.77
Yes	3.30	.73	3.43[b]	.86

* $p < .05$

Note: Means are based on a 5-point Likert scale

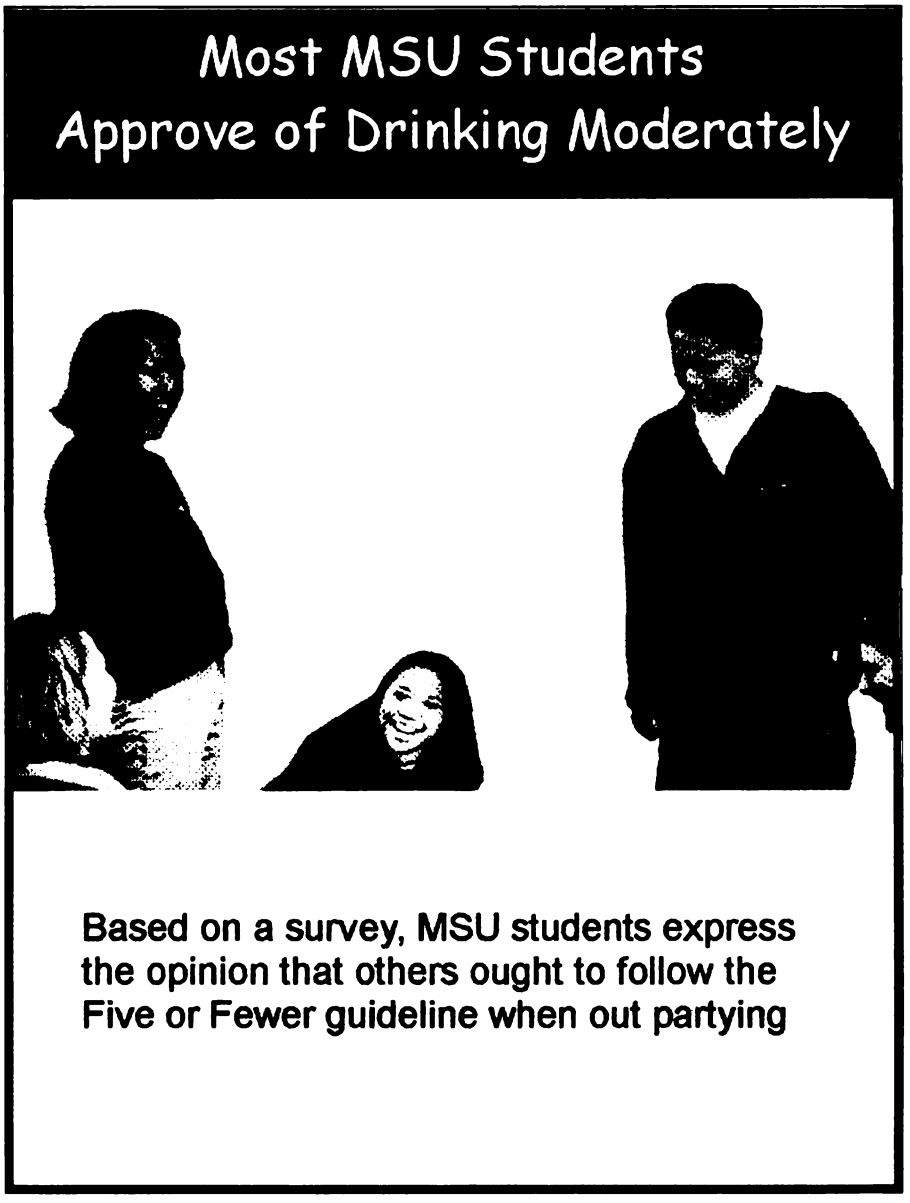
Differences between superscript a and b are significant at $p < .05$

APPENDICES

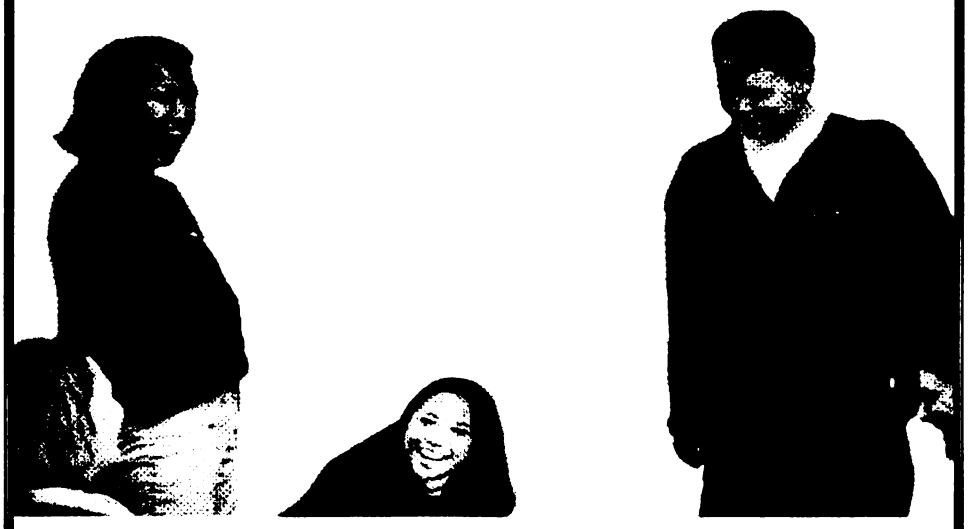
Appendix A

Messages

Main Study - No Evidence

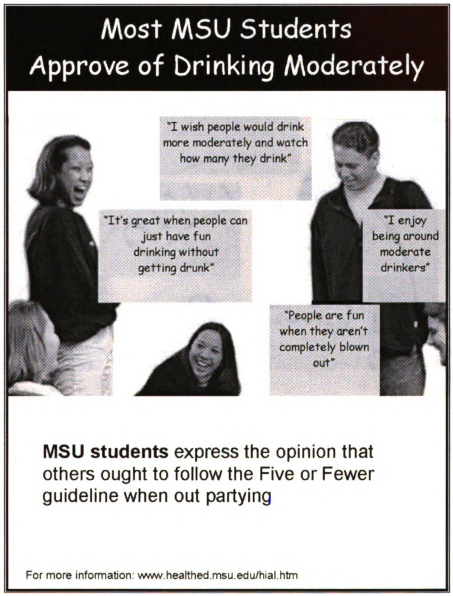


Most MSU Students Approve of Drinking Moderately



67% of MSU students* report holding the opinion that others ought to drink Five or Fewer when out partying

* National College Health Assessment
MSU 2002. N = 1,005, margin of error ± 3%
For more information: www.healthed.msu.edu/hial.htm


Most MSU Students
Approve of Drinking Moderately
"I wish people would drink more moderately and watch how many they drink"
"It's great when people can just have fun drinking without getting drunk"
"I enjoy being around moderate drinkers"
"People are fun when they aren't completely blown out"
MSU students express the opinion that others ought to follow the Five or Fewer guideline when out partying
For more information: www.healthed.msu.edu/hial.htm


Most MSU Students
Approve of Drinking Moderately
"I wish people would drink more moderately and watch how many they drink"
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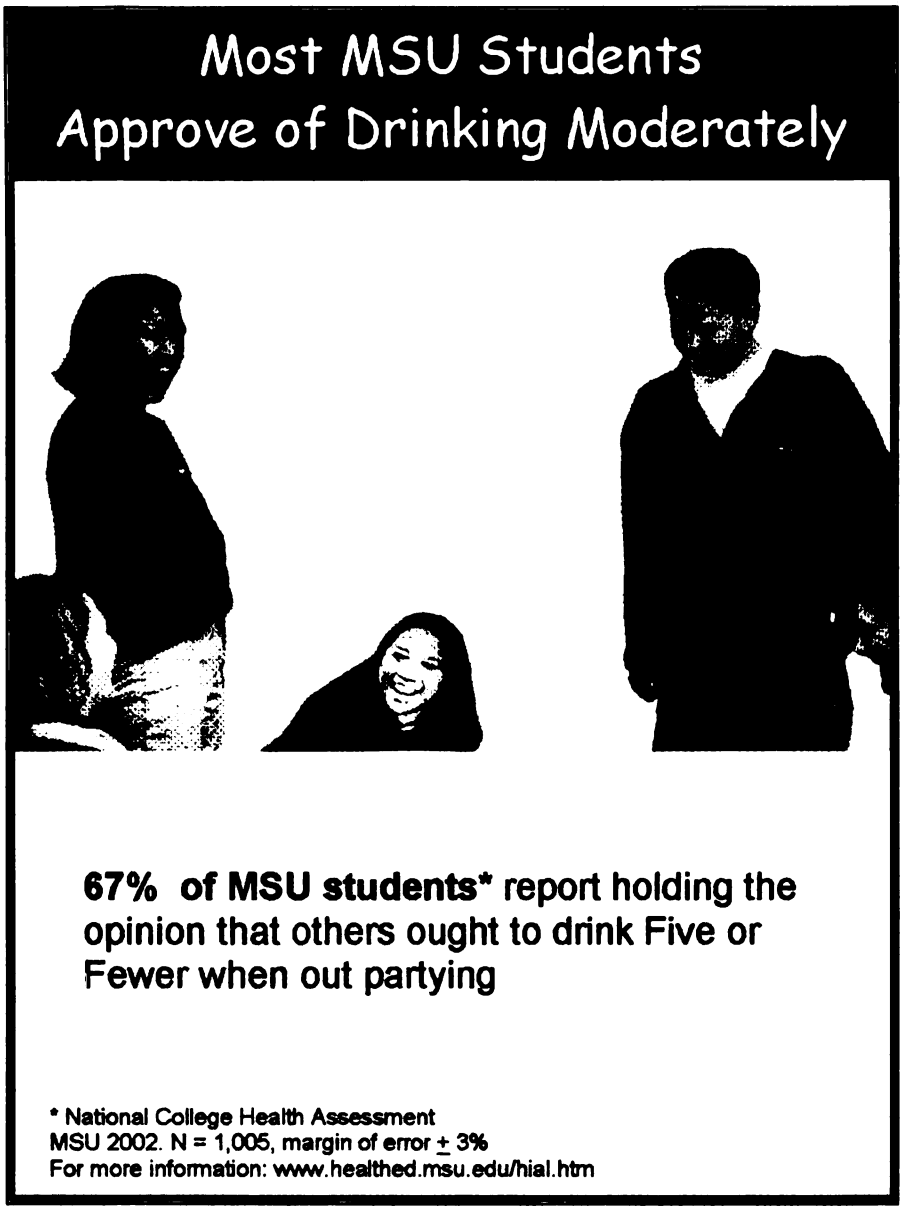
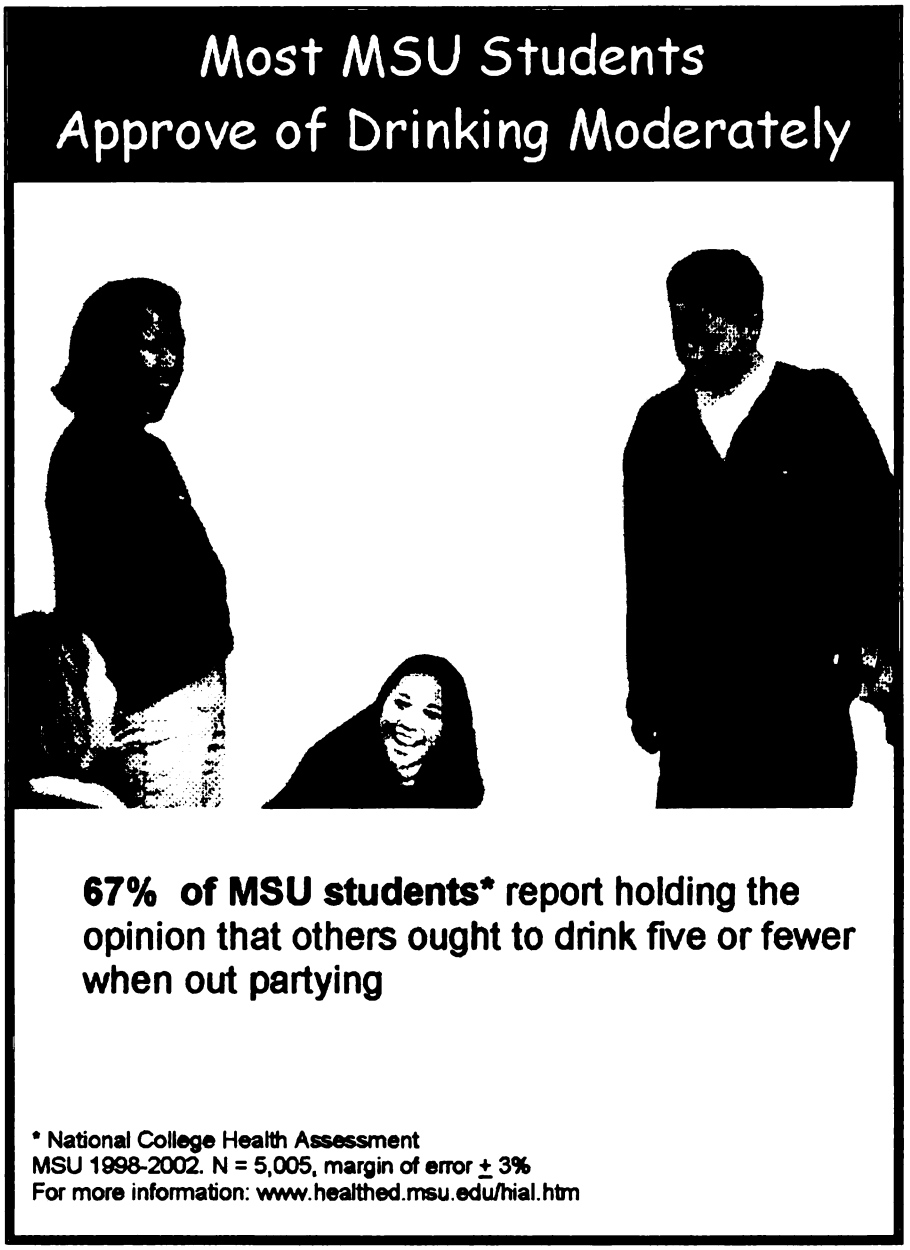
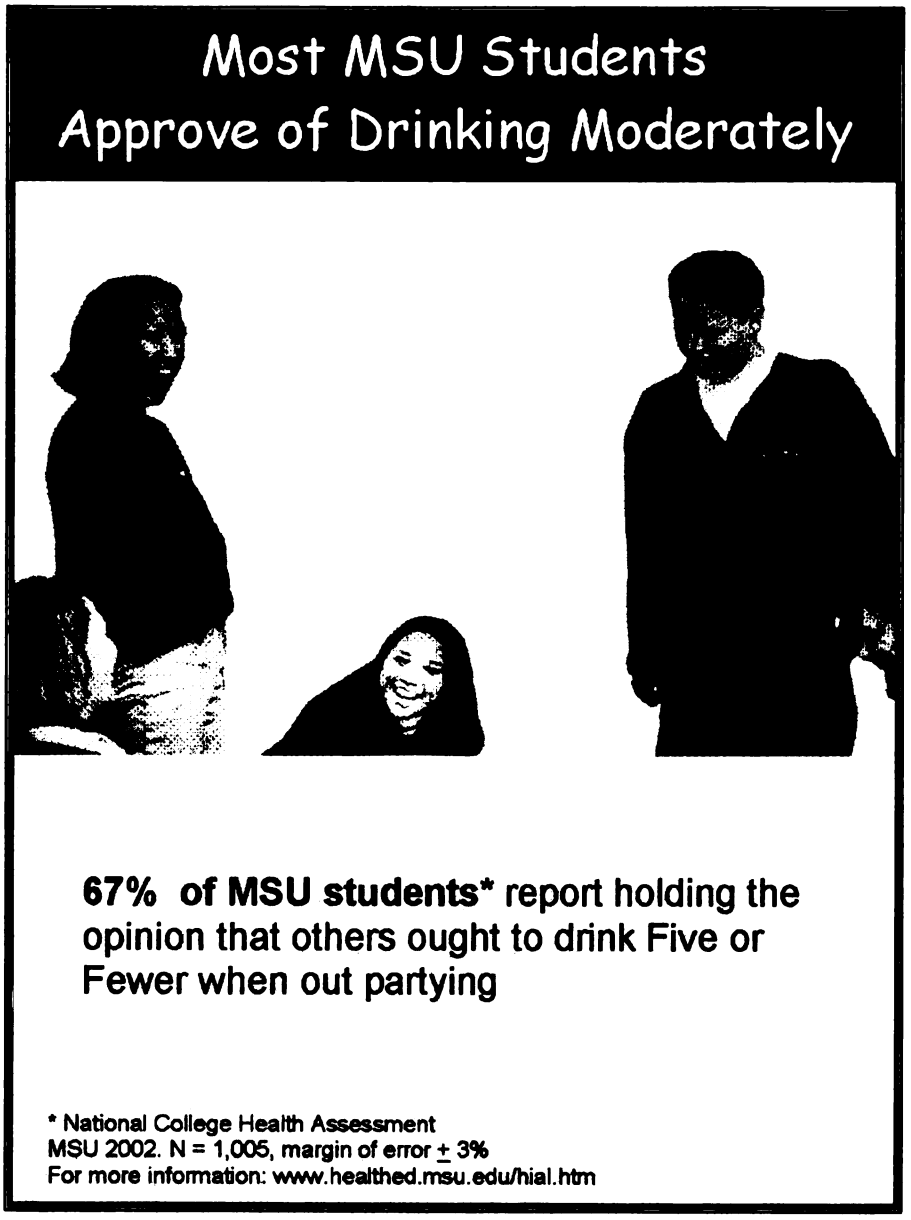
Supplemental Study A – One-Year Moderate Sample Size

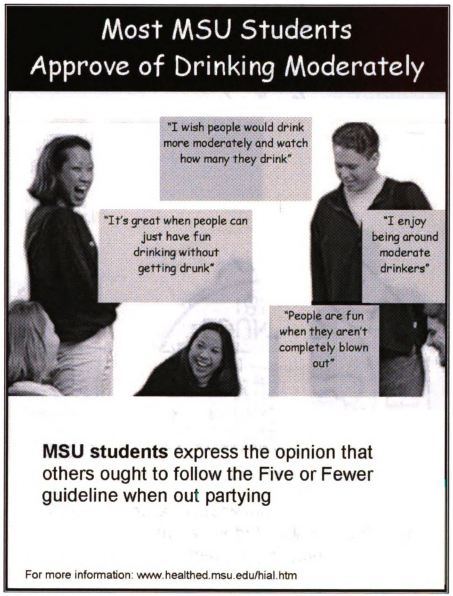



Most MSU Students
Approve of Drinking Moderately
67% of MSU students* report holding the opinion that others ought to drink five or fewer when out partying
* National College Health Assessment
MSU 1998-2002. N = 5,005, margin of error ± 3%
For more information: www.healthed.msu.edu/hial.htm

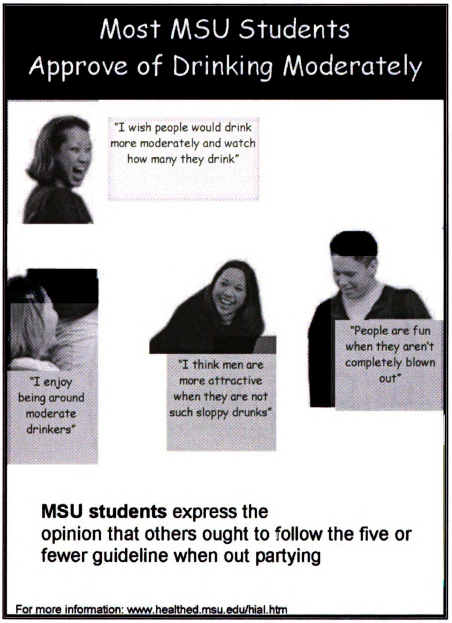

Most MSU Students
Approve of Drinking Moderately
67% of MSU students* report holding the opinion that others ought to drink Five or Fewer when out partying
* National College Health Assessment
MSU 2002. N = 1,005, margin of error ± 3%
For more information: www.healthed.msu.edu/hial.htm

Supplemental Study B – Quantitative Label

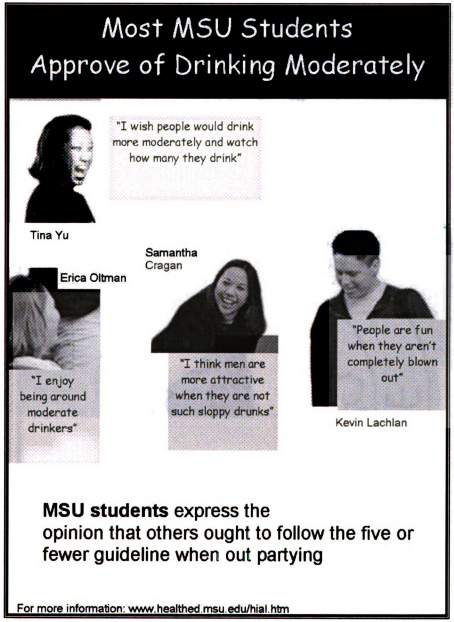
Supplemental Study C –Testimonial Aggregate Group Attribution



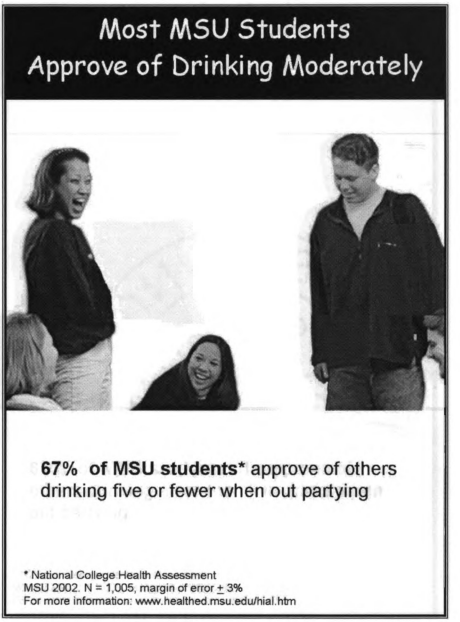
Supplemental Study C – Testimonial Individual Attribution



Supplemental Study C – Testimonial Named Individual Attribution



Supplemental Study D – Approval Message

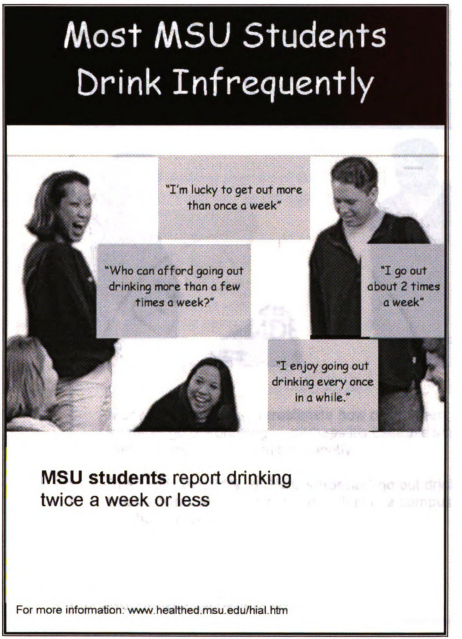


Supplemental Study D – Disapproval Message

Most MSU Students Drink Infrequently

81% of MSU students* report drinking twice a week or less

* National College Health Assessment
MSU 2002. N = 1,005, margin of error ± 3%
For more information: www.healthed.msu.edu/hial.htm


Most MSU Students Drink Infrequently
"I'm lucky to get out more than once a week"
"Who can afford going out drinking more than a few times a week?"
"I go out about 2 times a week"
"I enjoy going out drinking every once in a while."
MSU students report drinking twice a week or less
For more information: www.healthed.msu.edu/hial.htm

Most MSU Students Drink Infrequently

Many MSU students overestimate how often other students go out drinking ... perhaps it's because some of their friends seem to drink frequently.

The fact that **81% of MSU students*** go out drinking twice a week or less, according to data in a campus-wide alcohol survey.

* National College Health Assessment
MSU 2002. N = 1,005, margin of error ± 3%
For more information: www.healthed.msu.edu/hial.htm

Appendix B

Instrumentation

Instructions

Below are questions about your perceptions and attitudes. Please read the following questions and answer in a way that best estimates the approximate percentage.

Pre-message Injunctive Norms Perceptions

What percentage of MSU students approve of their peers drinking excessively when they go out partying? _____

What percentage of MSU students approve of their peers getting drunk when they go out partying? _____

What percentage of MSU students approve of their peers drinking five or more alcoholic beverages when they go out partying? _____

What percentage of MSU students approve of their peers frequently getting drunk when they go out partying? _____

What percentage of MSU students approve of their peers drinking 5 or fewer alcohol drinks when out partying? **(R)** _____

Continue to next page

The following questions refer to the message you just viewed. Choose a number from the scale below that indicates your degree of agreement with each of the following statements.

1 = *Strongly Disagree*
2 = *Disagree*
3 = Neutral
4 = *Agree*
5 = *Strongly Agree*

Descriptive Norms Perceptions

Most students on campus drink excessively when they go out partying. _____

It is a myth that most students get drunk frequently when they go out partying. **(R)**
_____

On average, the majority of students drink at unsafe levels when they go out partying.
_____

The campus norm is to drink to get drunk when going out partying. _____

Overall, only a minority of students drink at unsafe levels when they go out partying. **(R)**
_____

Most students drink at unhealthy levels most of the time when they go out partying.
_____

Injunctive Norms Perceptions

Most students are favorable toward heavy
drinking by other students when they go out partying. _____

Most students are favorable toward excessive
drinking by other students when they go out partying. _____

Most students are favorable toward other students drinking almost every day. _____

Most students disapprove of high levels of alcohol
consumption by other students when they go out partying. **(R)** _____

Most students approve of drinking frequently on weekday evenings. _____

Most students approve of drinking more than 5 drinks when going out partying. _____

Most peers feel that getting drunk is not appropriate behavior when going out partying. **(R)** _____

Most students approve of drinking more than twice a week. _____

Normative Expectations

Others on campus expect me to drink to extreme levels when I go out partying. _____

I do not think that others want me to drink to unhealthy levels when I go out partying. **(R)** _____

It is expected that college students drink heavily when they go out partying. _____

I believe that my peers want me to drink as much as they do when we go out partying. _____

When out partying, I believe that others want me to drink heavily. _____

Message Believability

The information presented in the message is credible. _____

The information presented in the message is reliable. _____

I believe that the message is a believable one. _____

It is difficult to judge if the description of student opinions is representative of the typical MSU student. ____

The information presented in the message is trustworthy. _____

I do not believe that the message is credible. **(R)** _____

The message is not very reliable. **(R)** _____

Induction Check

The evidence presented is backed by statistical information. _____

The message presents concrete examples of student opinions. _____

I could confirm the information in the message if I wanted to. _____

The evidence is supported by student testimonials. _____

The information in the message is verifiable. _____

The information presented could be validated. _____

I could check the information presented in the message if I needed to. _____

The message contains quotes that enhance the message. _____

Media Factors

How effective is this message in influencing the students to consume less alcohol?

VERY EFFECTIVE	FAIRLY EFFECTIVE	SLIGHTLY EFFECTIVE	NOT EFFECTIVE

What is your personal reaction to the message? Give ratings using a scale from 0 to 10 (with 10 being the highest score) on each of these factors:

_____ **INFORMATIVE**: tells you something new, increases your knowledge

_____ **SENSIBLE**: presents wise advice that seems reasonable

_____ **MEMORABLE**: vivid image, fascinating fact, catchy slogan

_____ **ENJOYABLE**: interesting, entertaining, stimulating message

_____ **USEFUL**: valuable information and helpful advice worth remembering

_____ **IMAGINATIVE**: style is refreshing, novel, unique, clever

_____ **BELIEVABLE**: accurate information, sincere/trustworthy characters

_____ **CONVINCING**: presents ideas you agree with

_____ **PROFESSIONAL**: production quality is well done

_____ **MOTIVATING**: presents influential reasons to change behavior

_____ **ON-TARGET**: content is personally meaningful, people/situations you can identify with

Indicate if the message has any of these negative features:

Yes No **PREACHY**: Was tone of message too moralistic or righteous?

Yes No **DISTURBING**: Turned off because it's too emotional or threatening?

Yes No **CONFUSING**: Is anything unclear, vague, or hard to understand?

Yes No **IRRITATING**: Did you find anything offensive or annoying?

Yes No **DULL**: Was the style boring, stale, or trite?

Yes No **MISLEADING**: Any biased arguments or exaggerated claims?

Overall rating of message: **EXCELLENT GOOD FAIR POOR**

Please tell us a bit about yourself

Sex: Female Male

Class: Freshman Sophomore Junior Senior Grad

I am a member of: ***(circle all that apply)***

Fraternity / Sorority Athletic team Honor's College Religious Institution

Do you consume alcoholic beverages? Yes No

On an average week, how often do you go out and party? _____ Days per week

On average, how many alcoholic drinks do you consume when you go out partying?
_____

When you examined the message, what specific types of students did you think about when reading words 'Most MSU Students'?

_____

_____

Thank you for your participation. Please turn in this survey and consent form to the investigator. Make sure that the consent form is separate from the survey to maximize privacy.

BIBLIOGRAPHY

Ah Yun, K., & Massi, L.L. (2000). *The differential impact of race on the effectiveness of narrative versus statistical appeals to persuade individuals to sign an organ donor card.* Paper presented at the meeting of the Western States Communication Association, Sacramento, CA.

Allen, M. (1991) Comparing the persuasiveness of one-sided and two-sided messages using meta-analysis. *Western Journal of Speech Communication, 55*, 390-404.

Allen, M. (1998). Comparing the persuasive effectiveness one- and two-sided messages. In M. Allen & R.W. Preiss (Eds.), *Persuasion: Advances through meta-analysis* (pp. 87-98). Cresskill, NJ: Hampton Press, Inc.

Allen, M. & Burrell, N. (1982). Evaluating the believability of sequential arguments. *Argumentation and Advocacy, 28*, 135-144.

Allen, M., Bruflat, R., Fucilla, R., Kramer, M., McKellips, S., Ryan, D.J., Spiegelhoff, M.(2000). Testing the persuasiveness of evidence: Combining narrative and statistical forms. *Communication Research Reports, 17*, 331-336.

Allen, M., & Preiss, R.W. (1997). Comparing the persuasiveness of narrative and statistical evidence using meta-analysis. *Communication Research Reports, 14*, 125-131.

Baesler, E.J., & Burgoon, J.K. (1994). The temporal effects of story and statistical evidence on belief change. *Communication Research, 21*, 582-602.

Borgida, E., & Nisbett, R.E. (1977). The differential impact of abstract vs. concrete information on decisions. *Journal of Applied Social Psychology, 7*, 258-271.

Borsari, B., & Carey, K. B. (2001). Peer influences on college drinking: A review of the research. *Journal of Substance Abuse, 13*, 391-424.

Brehm, J. W. (1966). *A theory of psychological reactance*: New York, N.Y., Academic Press.

Chaiken, S. (1980). Heuristic versus systematic information processing and the use of source versus message cues in persuasion. *Journal of Personality and Social Psychology, 39*, 752-766.

Cialdini, R. B., Reno, R. R., & Kallgren, C. A. (1990). A focus theory of normative conduct: Recycling the concept of norms to reduce littering in public places. *Journal of Personality & Social Psychology, 58*, 1015-1026.

Church, R.T., & Wilbanks, C. (1986). *Values and policies in controversy: An introduction to argumentation and debate.* Scottsdale, AZ: Gorsuch Scarisbrick.

Darley, J.M., & Gross, P.H. (1983). A hypothesis-confirming bias in labeling effects. *Journal of Personality and Social Psychology, 44*, 20-33.

Dickson, P.R. (1982). The impact of enriching case and statistical information on consumer judgments. *Journal of Consumer Research, 8*, 398-406.

Edwards, K., & Smith, E.E. (1996). A disconfirmation bias in the evaluation of arguments. *Journal of Personality and Social Psychology, 71*, 5-24.

Fediuk, T.A. (2004). *Social norms: Effectiveness of descriptive and injunctive norm messages on students differing in attention to social comparison information.* Unpublished manuscript, Michigan State University, East Lansing, Michigan.

Haines, M. P. (1996). *A social norms approach to preventing binge drinking at colleges and universities.* Newton, MA: The Higher Education Center for Alcohol and Other Drug Prevention.

Haines, M.P., & Barker, G.P. (2003). The Northern Illinois University experiment: A longitudinal case study of the social norms approach. In H.Wesley Perkins (Ed.), *The social norms approach to preventing school and college age substance abuse* (pp. 21-34). San Francisco, CA: Jossey-Bass.

Haines, M., & Spear, S. F. (1996). Changing the perception of the norm: A strategy to decrease binge drinking among college students. *Journal of American College Health, 45*, 134-140.

Hovland, C.I., Janis, I.L., Kelley, H.H. (1953). *Communication and persuasion: Psychological studies of opinion change.* New Haven, CT: Yale University Press.

Johannessen, K. J., Collins, C., Mills-Nova, B., & Glider, P. (1999). *A practical guide to alcohol abuse prevention: A campus case study in implementing social norms and environmental management approaches.* Newton, MA: The Higher Education Center for Alcohol and Other Drug Prevention.

Kahneman, D., & Tversky, A. (1973). On the psychology of prediction. *Psychological Review, 80*, 237-251.

Kazoleas, D. C. (1993). A comparison of the persuasive effectiveness of qualitative versus quantitative evidence: A test of explanatory hypotheses. *Communication Quarterly, 41*, 40-50.

Kopfman, J.E., Smith, S.W., Ah Yun, J.K., & Hodges, A. (1998). Affective and cognitive reactions to narrative versus statistical evidence organ donation messages. *Journal of Applied Communication Research, 26*, 279-300.

Lindsey, L.L.M., & Ah Yun, K. (2003). Examining the persuasive effect of statistical messages: A test of mediating relationships. *Communication Studies, 54*, 306-321.

Lord, C.G., Ross, L., & Lepper, M.R. (1979). Biased assimilation and attitude polarization: The effects of prior theories on subsequently considered evidence. *Journal of Personality and Social Psychology, 37*, 2098-2109.

Lucas, S. (1989). *The art of public speaking* (3rd ed.). New York: Random House.

McCrosky, J.C. (1969). Summary of experimental research on the effects of evidence in persuasive communication. *Quarterly Journal of Speech, 55*, 169-176.

McGuire, W.J. (2001). Input and output variables currently promising for constructing persuasive communications. In R.E. Rice & C.K. Atkin (Eds)., *Public communication campaigns* (3rd Edition) (pp. 22-48). Thousand Oaks, CA: Sage Publications, Inc.

Munro, G.D., & Ditto, P.H. (1997). Biased assimilation, attitude polarization, and affect in reactions to stereotype-relevant scientific information. *Personality and Social Psychology Bulletin, 23*, 636-653.

Nisbett, R.E., & Borgida, E. (1975). Attribution and the psychology of prediction. *Journal of Applied Social Psychology, 32*, 932-943.

Perkins, H. W. (1997). College student misperceptions of alcohol and other drug norms among peers: Exploring causes, consequences, and implications for prevention programs. In *Designing alcohol and other drug prevention programs in higher education* (pp. 177-206). Newton, MA: The Higher Education Center for Alcohol and Other Drug Prevention.

Perkins, H. W. (2002). Social norms and the prevention of alcohol misuse in collegiate contexts. *Journal of Studies on Alcohol, supplemental no. 14*, 164-172.

Perkins, H.W. (2003). The emergence and evolution of the social norms approach to substance abuse prevention. In H.Wesley Perkins (Ed.), *The social norms approach to preventing school and college age substance abuse* (pp. 3-17). San Francisco, CA: Jossey-Bass.

Perkins, H. W., & Berkowitz, A. D. (1986). Perceiving the community norms of alcohol use among students: Some research implications for campus alcohol education programming. *International Journal of the Addictions, 21*, 961-976.

Perkins, H. W., & Craig, D. W. (2002). *A multifaceted social norms approach to reduce high-risk drinking*. Newton, MA: Higher Education Center for Alcohol and Other Drug Prevention.

Perkins, H.W., & Craig, D.W. (2003). The Hobart and William Smith Colleges experiment: A synergistic social norms approach using print, electronic media, and curriculum infusion to reduce collegiate problem drinking. In H.Wesley Perkins (Ed.), *The social norms approach to preventing school and college age substance abuse* (pp. 35-64). San Francisco, CA: Jossey-Bass.

Perkins, H. W., Meilman, P. W., Leichliter, J. S., Cashin, J. R., & Presley, C. A. (1999). Misperceptions of the norms for the frequency of alcohol and other drug use on college campuses. *Journal of American College Health, 47*, 253-258.

Perkins, H. W., & Wechsler, H. (1996). Variation in perceived college drinking norms and its impact on alcohol abuse: A nationwide study. *Journal of Drug Issues, 26*, 961-974.

Petty, R.E., & Cacioppa, J.T. (1986). *Communication and persuasion: Central and peripheral routes to attitude change*. New York: Springer-Verlag.

Prentice, D. A., & Miller, D. T. (1993). Pluralistic ignorance and alcohol use on campus: Some consequences of misperceiving the social norm. *Journal of Personality and Social Psychology, 64*, 243-256.

Reinard, J.C. (1988). The empirical study of the persuasive effects of evidence: The status after fifty years. *Human Communication Research, 15*, 3-59.

Reynolds, R.A. (1987). *The effects of cognitive elaboration, valid arguments, evidence, and message style in persuasive discourse*. Unpublished doctoral dissertation, Michigan State University, East Lansing, Michigan.

Reynolds, R.A., & Reynolds, J.L. (2002). Evidence. In J.P.Dillard & M. Pfau (Eds.) *The persuasion handbook: Developments in theory and practice* (pp. 427-444). Thousand Oaks, CA: Sage Publications.

Rosenthal, P.I. (1971). Specificity, verifiability, and message credibility. *Quarterly Journal of Speech, 57*, 393-401.

Sher, K. J., Bartholow, B. D., & Nanda, S. (2001). Short- and long-term effects of fraternity and sorority membership on heavy drinking: A social norms perspective. *Psychology of Addictive Behaviors, 15*, 42-51.

Stiff, J.B. (1986). Cognitive processing of persuasive message cues: A meta-analytic review of supporting information on attitudes. Communication Monographs, 53, 75-89.

Toulmin, S. *The uses of argument*. Cambridge, UK: Cambridge Universtiy Press.

Wechsler, H., Kelly, K., Weitzman, E. R., San Giovanni, J. P., & Seibring, M. (2000). What colleges are doing about student binge drinking. *Journal of American College Health, 48*, 219-226.

Wells, G.L., & Harvey, J.H. (1977). Do people use consensus information in making causal attributions? *Journal of Personality and Social Psychology, 35*, 279-293.

Wheeler, M. (1976). *Lies, damn lies, and statistics: The manipulation of public opinion in America*. New York: Liveright.

Wood. W., Rhodes, N., & Biek, M. (1995). Working knowledge and attitude strength: An information-processing analysis. In R.E. Petty (Ed.) *Attitude strength: Antecedents and consequences*. Mahway, NJ: Lawrence Erlbaum.