

Human Communication. A Publication of the Pacific and Asian Communication Association.
Vol. 10, No. 3, pp. 311 – 328.

**Communicating with College Students about STIs:
Assessing Message Effectiveness and Preferred Source and Channel**

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Abstract

This quasi-experiment explored effectiveness of message types (fearful, informative, or humorous) used to educate students about Sexually Transmitted Infections (STI) and preferred sources and channels for receiving them. STIs are a top health risk for 18 to 25 year olds (Synovitz, Herber, Kelly & Carlson, 2002) with numbers increasing across college campuses (Summerfield & Steinhoff, 1996). One hundred fifty undergraduate students responded to one of the three message types. Utilizing protection motivation theory (Rogers, 1975, 1983) as a theoretical lens, results revealed significant differences in effectiveness of message type with fearful being the most effective. Effectiveness also varied according to channel and source.

Communicating with Students about STIs: Assessing Message Effectiveness and Preferred Source and Channel

Sexually Transmitted Infections (STIs) are considered one of the top health risks for college students between the ages of 18 and 25 (Synovitz, Herber, Kelley & Carlson, 2002). The Center for Disease Control and Prevention (CDC) reported (2000) that more than 65 million Americans have incurable STIs such as HIV, human papillomavirus (HPV) and gonorrhea, with 15 million infected every year. According to the Bacchus Gamma Peer Health Education Network (2006) two-thirds of all STI cases in the United States occur in people 25 years of age or younger, the age of a traditional college student. In fact, the rise in STIs has become a major concern on college campuses (Summerfield & Steinhoff, 1996). Afifi and Weiner (2006) described an astounding rate of STIs on college campuses with 40% of sexually active students infected with HPV, the most prevalent STI. One of the primary reasons for this high susceptibility is young adult college students tend to engage in riskier sexual behavior leading to increased risk of STIs (Abdullah, Fielding, & Hedley, 2003; Meekers & Klein, 2002). The persistent threat calls into question whether they are receiving messages regarding the prevalence and threat of STIs and if so, whether they understand them and feel capable of responding.

Protection motivation theory (PMT) has been widely used to study the role of perceived efficacy in specific health communication issues (Rogers, 1975, 1983) and the motivations for handling a possible risk. Communication efficacy reflects an individual's perceived ability to communicate and obtain needed information (Afifi & Weiner, 2004). PMT contends if individuals understand the degree of risk involved, they will be motivated to protect themselves from that risk (Youn, 2005). With STI messages, therefore, it becomes important to determine the most effective means to reach college students. According to Cheah (2006), research aimed at young adults and focusing on message development for sexual health campaigns has been relatively nonexistent. In line with this, Bull, Cohen, Ortiz and Evans (2002) suggested the majority of STD campaign materials are based on untested assumptions. Therefore, investigating STI messages along with the sources and channels college students view as most effective and with which they are most responsive could help universities develop long term health campaigns aimed at educating them about STIs and protection. Many students are simply not educated on the topic because they do not understand its importance or personal relevance, especially if they abstain from sexual activity (Fields, 2002). Whether they are sexually active, however, is not the primary issue; being aware of the information will help them make educated decisions in the future and perhaps assist them in helping a friend locate needed help. Active education is the key to lowering the high STI rates on college campuses (Van Haveren, Blank, & Bentley, 2001) therefore this study's overarching goal was aimed at helping health educators on college campuses understand what communication tactics are seen as most effective by their primary audience: college students. The purpose of the present quasi-experiment was to determine the most effective and comfortable message, source, and channel for educating students about STIs. This could provide the first step to discovering a new way to relate the importance of protection and available services.

Review of Literature

Communicating to educate U.S. college students about sexually transmitted infections and prevention is becoming more important as it has become a critical health issue (Synovitz et al., 2002). The American Social Health Association (ASHA) suggests social stigma and lack of STI awareness are the primary discussion inhibitors (ASHA, 1998). Unfortunately, the CDC

continues to report a rise in STIs. The incidence of genital herpes infections, for example, has increased by 30 percent since the late 1970's (CDC, 2006) and there was a 6.5% increase in cases of Chlamydia between 2001 and 2002 (CDC, 2002). According to the Guttmacher Institute (1994) each year one in four U.S. teens contracts an STI with about half of all STIs in 2000 reported in young people between the ages of 15 and 24 (Weinstock, Berman, & Cates, 2004). These numbers translate, unfortunately, to a rising incidence of STIs among college students, prompting universities to consider different message tactics, sources, and channels for communicating the importance of protection and prevention rather than abstinence (Summerfield & Steinhoff, 1996). Studies have, in fact, shown college students lack knowledge about STIs (Synovitz et al., 2002) and believe they are invulnerable (Ku et al., 2002). This view has, unfortunately led to the rise in STI incidence among young adults in the U.S. (Cheah, 2006), creating an increased need for the development of effective sexual health education. Television has typically been the major source of effective health message campaigns, issuing warnings about topics such as AIDS, drug abuse, drinking and driving, and smoking (Block & Keller, 1995). However, it has been reported that today's college students spend less time watching television and more time on computers (Davis, 2006; Story, 2007). A majority of students according to one study spend less than three hours per week watching television (Davis, 2006). If television is not a prime message outlet, other more effective means must be discovered to disseminate STI information.

Sheer and Cline (1995) suggested prevention education programs and active awareness on college campuses are important methods of educating students on STIs. In addition, they advocated these programs over persuasive appeals aimed at changing risky behavior. Fields (2002) reported a need for formalized programs on campuses as the majority of sex education outreach is based on unwanted pregnancy and assault with significantly less time spent on STI education. Though the federal government's mandate that sexual assault prevention efforts be conducted on all college campuses is vital, it is primarily targeted for women and fails to incorporate STI education (Anderson & Wiston, 2005). A reduced focus on STI education creates a need for colleges to discover the most viable means to spread the word if it is to reach students at all. According to Van Haveren et al. (2001) active education is the most successful means to inform students that fall in the age range of 18 to 25. Choosing an effective message and means of communication is the key to convincing a college student they may be at risk yet have control over protecting themselves from becoming infected with an STI (Van Haveren et al., 2001).

This study utilized Rogers's (1975, 1983) protection motivation theory (PMT) as a theoretical lens to help explain college students' perceptions of STI messages, sources, and channels. PMT contends individuals must perceive something to be risky or harmful to be motivated to protect oneself. Rogers asserted that this motivation to protect is behavior inducing. This theory creates a logical link to STI communication and education due to the connection between message understanding and value, self-efficacy, and the outcome behaviors college students have following exposure to STI messages. It is important for them to understand the STI risk as well as their ability to take control of their sexual behavior and protect themselves (Van Haveren et al., 2001). Weinstock et al. (2004) reported half of all new STI's in 2000 occurred among young people between the ages of 15 and 24 and the practice of unprotected sex on college campuses has resulted in a high percentage of students infected with STIs. Therefore, effective health campaigns or messages are invaluable for educating and inducing behavior.

Past research connecting the use of fear and self-efficacy in health campaigns offers a direct link to the current study as the use of fear alone has not been shown to adequately persuade people to change their attitudes (Witte, 1994). It is through feelings of self-efficacy that individuals are motivated to change their attitudes or behaviors (Witte, 1994). Threatening messages combined with alternative solutions allows individuals to feel in control (e.g., efficacy to promote condom use). Witte (1994) utilized this method in an experiment investigating fear in AIDS-related messages and confirmed the combined effectiveness of fear and message self-efficacy. In an investigation of fear appeals in the college classroom, Sprinkle, Hunt, Simonds, and Comadena (2006) reported positive effects (learning) of fear and efficacy together compared to the use of fear alone. Other studies, however, have reported negative effects of fear (Hastings, Stead, & Webb, 2004), recommending the use of positive reinforcement appeals in social marketing campaigns. Beaudoin (2002) explored antismoking ads and reported enhanced effectiveness with humor in youth-oriented advertising and fear for adult-oriented advertising. Earlier research by Booker (1981), however, found mixed effects for fearful messages in advertising with highly correlated, positive effects for humor and straightforward information messages. Focus group research by Cheah (2006) suggested college students have preferences for message type, channel, and source and that STI information should be gradually relayed to them through a variety of means and communication channels. While informative, this finding fails to create an understanding of what actually works best. With STI information, therefore, the initial step must be to determine the most effective messages.

Mixed findings regarding STI messages for college students stimulated the development of three message variations: humor, informative, and fearful. Rogers's (1975, 1983) protection motivation theory was incorporated as a lens to explain the perceived effectiveness of the three messages according to their ability to induce motivation for handling the risk associated with the STI messages (e.g., campus specific statistics illustrating the prevalence of STIs), self-efficacy (e.g., information on how and where to get protection) and response efficacy (e.g., I will go to the health center for purchase of latex and testing). Atkin and Freimuth (1989) explain that formative evaluation research, as in the current study, is important when creating a health campaign aimed at prevention to develop messages that will not only appeal to the target audience, but will also create a realistic connection between the audience and the health risk. As past research has reported differential impacts of message type, the following hypothesis was created:

H1: Fearful, humorous, and informative message types will differ in level of perceived effectiveness.

In addition to message type, source and channel may also impact student responsiveness and overall message effectiveness (Rimal, Flora, & Schooler, 1999). Marin and Marin (1991) suggested the value of investigating source and channel credibility in AIDS health messages. Their findings indicated manipulation of sources and channels used in a campaign can affect message effectiveness. Marshall, Smith, and McKeon (1995) also supported the value of source and channel with their investigation of health messages regarding cervical and breast cancer. They discovered within group commonalities for persuasive strategies, sources, and channels along with overall differential group preferences (Marshall et al., 1995). Cheah's qualitative analysis (2006) suggested a broad range of channels for receiving STI messages was preferred by college students. Channels such as mandatory classes, the web, public service announcements, posters, exhibitions, campus sexual awareness events, and pamphlets were suggested (Cheah,

2006). Credibility of the source disseminating this information, however, was also a strong point of consideration. Previous research has consistently shown that credibility enhances message acceptance (Chebat, Filiatrault, & Perrien, 1990) and has consistently reported the persuasive effects of highly credible sources (Greenberg & Miller, 1966; Greenberg & Tannenbaum, 1961). Gaining a clearer overall understanding of the source from which students prefer to receive STI information as well as how or where they receive it will allow active communication and, ultimately, education to begin. This will enable campuses to offer students numerous opportunities for message exposure. With this past research in mind, the key to reaching college students may be discovering source and channel preferences for receiving different types of STI messages (fearful, informative, and humorous). Therefore, the following hypothesis was created:

H2: Preferred source and channel will differ according to message type (fearful, informative, and humorous).

To assist university health programs in developing a more complete understanding of channel and source effectiveness in regard to message type, it was also important to discover why students found specific sources and channels more effective or comforting. In an effort to accomplish this, an open-ended section of survey questions was provided to participants. Keyton (2006) posited that the use of qualitative data could provide considerable support for quantitative findings. Therefore, the following research question was created to develop a more complete understanding of participants' preferred sources and channels:

RQ1: What reasons do students provide for rankings of their most and least preferred source and channel?

Method

Participants

Full-time undergraduate students at a large southern university were asked to complete the study's survey instrument. After obtaining IRB approval, instructors of the basic communication course (a required university course) allowed surveys to be completed in their classes. All participants were debriefed on the study and signed consent forms indicating their agreement to participate. Three separate surveys measuring the effects of message type (fearful, informative, and humorous) source, and channel were created. One hundred-fifty total surveys were completed with 50 surveys for each message type. Surveys were randomly distributed with even numbers of each message type distributed to each class. Each student was only presented one message type. All 150 surveys were completed to measure message type with nine surveys eliminated from the source and channel analyses due to missing information. Participants consisted of 89 females and 61 males and 39 freshman, 42 sophomores, 30 juniors and 39 seniors.

Variables

In order to measure the effectiveness (self-efficacy, and response efficacy) of STI messages and the subsequent preference for source and channel, several variables were incorporated. The independent variable representing the study's health campaign approach was the type of message provided to participants (fearful, informative, and humorous). These messages were written to reflect their respective communicative tone or approach to STI warnings. Preferred source and channel for receiving the message and message effectiveness represented the dependent variables as impacted by message type. To measure effectiveness, students were asked to reveal how persuasive they perceived the messages to be along with their ability (self-efficacy) and likelihood of following the STI message recommendations (response

efficacy). Source and channel variables were also examined with a follow-up qualitative section of the survey instrument to justify and explain participants' first and last choices for source and channel. Specific sources and channels were chosen based on past study results where college students reported in focus groups the most preferred source and channel for receiving STD information (Cheah, 2006). Sources incorporated in the present survey were as follows: medical doctor, health center official, certified peer educator, guest lecturer, instructor/professor, resident advisor, hall director, campus posters and orientation leader. Channels included in the survey were as follows: large lecture, small class, dorm lobby, orientation, voluntary information session, health fair and one-on-one discussion.

Message Development

The fearful and humorous messages utilized in the current study were adapted from existing messages developed and used by Ohio University's Department of Health Education and Wellness. According to Kopchick, head of this department, "there has been a significant increase in the number of students who have come to the health center to be tested for STIs since using these messages" (C. Kopchick, personal communication, October 15, 2005). Due to the reported success of these messages, the authors chose to use them as a basic framework for the present study. This information along with research supporting the use of a variety of message types for developing health campaigns (Beaudoin, 2002; Booker, 1981; Cheah, 2006), led to the creation of three new messages (fearful, neutral—strictly informative, and humorous) developed and specifically adapted to the university where the research was conducted.

Manipulation Check

To determine the successful development of message types, a manipulation check was conducted. Researchers designed three messages (fearful, informative, and humorous) and enlisted 285 undergraduate students, unfamiliar with the study, to indicate, on three 5-point Likert-type scales, the extent to which they thought a message was fearful, informative, humorous (see Appendix). Each student was provided only one message and asked to indicate their perceptions of its fear, information provided, or humor. The informative or neutral message was created by stating the information about STIs and the campus health center in a very straightforward manner without using any obvious message tone. The humorous message used rhyming phrases with slang terms that encouraged the use of latex protection while also providing ways to get more information about STIs from the campus health center. The final message used fear by applying the campus' STI statistics.

A one-way ANOVA was computed comparing the perceptions of one of each of the STI message manipulations (fear, informative, humor). A significant difference in message perception was found among the three STI messages: Fearful ($F(2,282) = 55.95, p < .001$), Informative ($F(2,282) = 11.88, p < .001$), and Humorous ($F(2,282) = 220.92, p < .001$). Tukey's HSD was used to determine the nature of the different message perceptions. This analysis revealed that students who viewed the fearful message perceived it to be significantly more fearful ($M=4.10, SD=.93, p < .001$) than either informative ($M=3.08, SD=1.22$) or humorous ($M=2.36, SD=2.37$). Students who viewed the informative STI message perceived it to be significantly more informative ($M=4.18, SD=.80, p < .001$) than either fearful ($M=3.69, SD=1.21$) or humorous ($M=3.42, SD=1.19$). Finally, students who viewed the humorous message found it to be significantly more humorous ($M=4.16, SD=1.03, p < .001$) than either fearful ($M=1.60, SD=.88$) or informative ($M=1.68, SD=.94$). With the significance of these results, it appears the tone of each message was properly manipulated.

Survey Instrument

The entire survey was separated into three sections. The first section measured student perceptions of the effectiveness (persuasiveness, self-efficacy, and response efficacy) of one of the three message types. The second section asked students to indicate their rankings of preferred source and channel for the respective message they received in the first survey section (fearful, informative, or humorous). The final qualitative section asked students to describe their reasoning for the rank order of their most and least preferred source and channel selections.

Message effectiveness. The first section of the survey in this quasi-experiment incorporated an instrument to measure message effectiveness (persuasiveness, self-efficacy, and response efficacy) developed from a series of studies by Keller and Block (1997). Their general purpose was to measure the persuasiveness of a health campaign message to determine how able and likely subjects would be to use the information shown in health campaign brochures. They reported alphas ranging from .78 to .84 (Keller & Block, 1997). In the 12-item scale items one through four were Likert-type items ranging from one (strongly disagree) to five (strongly agree). These items focused on whether or not the subjects found the information presented to be beneficial in their future efforts to protect themselves from becoming infected with an STI. Items five through nine were Likert-type items with scores ranging from one (very unlikely) to five (very likely). These items were used to measure the likelihood that subjects would feel capable of engaging in the immediate behaviors recommended by the message (self-efficacy) and their intent to actually engage in this behavior (response efficacy). Items ten through twelve utilized a semantic differential scale (useful-useless, helpful-not helpful, persuasive-not persuasive) ranging from one to seven. These three items were used to measure whether subjects found the information presented as useful, helpful, and persuasive.

Possible scores on the entire instrument ranged from a low score of 12 to a high score of 66. Higher scores on the instrument indicated greater message effectiveness due to feelings of being persuaded, motivated, and the likelihood of responding to the message recommendations. Minor adjustments to the scales' items were made by adapting them to an STI and protection content. For example, items that previously stated, "I believe the pamphlet is persuasive" and "I am likely to follow the recommendations in the brochure" were altered to read, "I believe the STI message provided is persuasive" and "I am likely to follow the recommendations in the STI message provided." The adapted scale for this study produced an alpha coefficient of .81.

Source and channel. The second section of the survey focused on specific sources and channels for health campaign messages. Two separate lists of channels and sources were created to represent an exhaustive possibility of options for the specific campus represented in the study. Based on previous studies' procedures (Rimal et al., 1999; Witte, 1994) and information provided by Ohio University's Department of Health Education and Wellness, participants were asked to rank order the nine source options and seven channel options. To assist college and university health campaigns hoping to educate the greatest number of students on STI risk and prevention, the third survey section incorporated open-ended questions. Following each list of rank-ordered source and channel, students were asked to justify their first and last choices.

Results

Hypothesis one predicted differential levels in student perceptions of effectiveness for fearful, informative, and humorous STI messages. A one-way ANOVA was conducted and significant differences were discovered in STI message effectiveness for the three messages ($F(2,147) = 19.83, p < .001$). Follow-up post-hoc analysis (LSD) revealed the fearful message ($M = 52.70, SD = 6.84$) was found to be significantly more effective ($p < .001$) than the humorous message ($M = 44.18, SD = 7.52$) and the informative ($p < .05$) message ($M = 49.68, SD = 6.14$). In

addition, the informative STI message ($M=49.68, SD=6.14$) was significantly more effective ($p<.001$) than the humorous message ($M=44.18, SD=7.52$). Students appear to perceive differences in the effectiveness of STI messages with fearful having the greatest effect.

Hypothesis two predicted differential source and channel preferences based on message type. After students rated the effectiveness of their particular STI message (fearful, informative, or humorous), they were asked to rank order the preferred source and channel for receiving this message. Sources were ranked from one to nine with one being the most preferred and nine the least preferred; channels were ranked from one to seven, one being the most preferred and seven the least preferred. Frequency distributions were obtained to discover preferred sources (1=most preferred; 9=least preferred) and channels (1=most preferred; 7=least preferred). Examining mean scores (see Table 1) for each enabled researchers to determine which sources and channels were preferred by the participants for each message type.

Table 1: Kruskal-Wallis Results for Preferred Channel and Source of Fearful, Informative, and Humorous STI Messages

CHANNEL	Fearful			Informative			Humorous		
	M	SD	Mean Rank	M	SD	Mean Rank	M	SD	Mean Rank
Dorm Lobby**	3.89	1.92	83.40*	4.61	1.98	60.78	3.49	2.13	69.13
One-On-One	4.81	2.51	64.37	4.63	2.27	78.16*	5.29	2.38	70.34
Orientation	3.92	2.20	70.76	3.96	2.17	72.27*	4.02	1.91	69.99
Large Lecture**	3.27	1.36	62.39	3.13	1.44	82.55*	3.89	1.63	67.94
Small Class	3.52	1.65	62.42	3.17	1.66	80.19*	3.98	2.01	70.22
Health Fair**	4.54	1.99	69.93	4.00	1.96	61.43	3.58	1.91	81.40*
Voluntary Info. Session	4.15	1.87	79.73*	4.48	1.88	61.52	3.79	1.46	71.92
SOURCE									
Medical Doctor	2.02	2.44	69.88	1.76	1.69	74.51*	2.53	2.89	68.64
Peer Educator	3.38	1.77	63.96	3.11	1.61	73.04*	4.11	2.34	69.40
Health Center	3.56	1.61	62.38	3.15	1.58	76.74*	3.91	1.97	73.64
Guest Lecturer	4.63	1.89	77.63*	5.11	2.05	66.77	4.62	1.70	68.79
Professor	4.92	2.21	74.63*	5.37	2.10	73.04	5.28	1.89	65.52
Hall Director	6.38	1.77	72.41*	6.54	1.55	71.34	6.45	1.80	69.31
Posters	6.63	2.32	76.49	6.55	2.39	58.82	5.29	2.87	77.67*
Orientation Leader	6.65	1.83	74.84*	6.91	2.23	71.73	6.55	2.58	66.60
Resident Advisor**	6.79	2.10	68.87	6.54	1.55	65.69	6.26	2.05	78.24*

* Indicates highest mean ranking within message type; ** Significant at $p < .05$

A Kruskal-Wallis test was conducted on this ordinal data to compare the preferred channel, or location, for receiving STI information when presented with fearful, informative, or humorous message types. Significant results were found for the dorm lobby, large lecture class, and health fair (see Table 1). Preferred message types significantly differed for the dorm lobby

($H(2)=7.45, p<.05$) with the informative message receiving the lowest mean ranking of 60.78 or most preferred message, the humorous message averaging 69.13 and the fearful message receiving the highest mean ranking or least preferred message type with $M=83.40$. In other words, students did not want to hear a fearful message about STIs in their dorm lobby. Preferred message type also significantly differed in the large lecture class ($H(2)=6.35, p<.05$) with the fearful message receiving the lowest mean ranking of 62.39 or most preferred message, the humorous message averaging 67.94 and the informative message receiving the highest mean ranking of 82.55. Students perceived the fearful message to be more effective in the large lecture class. Finally, preferred message type significantly differed in the health fair channel ($H(2)=5.87, p<.05$) with the informative message receiving the lowest mean ranking of 61.43 or most preferred message type, the fearful message averaging 69.93 and the humorous message receiving the highest mean ranking or least preferred message type with $M=81.40$. Students prefer straightforward information in the health fair setting. It appears, therefore, that students have differential preferences for the type of STI message received in at least three locations: dorm lobby-informative, large lecture-fearful, and health fair-informative.

A Kruskal-Wallis test was also conducted on the ordinal data to compare the preferred source for receiving fearful, informative, or humorous messages about STIs. Only one significant result (see Table 1) was found for posters around campus ($H(2)=6.49, p<.05$), with the informative message type receiving the lowest mean ranking or most preferred message type with $M=58.82$, the fearful message receiving an average ranking of 76.49 and the humorous message type receiving $M=77.67$. As message type only significantly varied with the posters around campus source, it appears fearful, humorous, or informative messages are perceived acceptable to be delivered by most all sources provided.

Research question one produced qualitative data based on the respondents' justifications for their most and least preferred sources and channels according to message type received. A thematic analysis (Strauss & Corbin, 1998) was undertaken in order to code common themes students provided for the two source and channel rankings. The three authors in the current study separately coded themes emerging from participant responses using a consistent comparison method. As the themes emerged from the data, labels were assigned (Glaser & Strauss, 1967). Once separate themes were designated, a comparative analysis was conducted and a .86 intercoder reliability for themes of source and channel was achieved. Qualitative results revealed similar justifications for all three messages presented in the experiment. Three common themes appeared when justifying source: Comfort Level ("I hate my dorm's resident assistant and I don't want to talk to her about sex."), Credibility Concerns ("Doctors or someone else certified are educated and more credible sources."), and Exposure ("Posters will catch people's attention and will reach a lot more people."). Four common themes resulted when evaluating channels: Comfort Level with Location Size (less embarrassment in large vs. small classroom groups), Comfort Level with Others (being with familiar individuals decreases involvement), Familiarity of Channel (greater comfort with information provided in familiar surroundings), and Exposure Capabilities (information presented in environments requiring attendance).

Discussion

Protection motivation theory (Rogers, 1975, 1983) was used as a lens to help explain college students' perceptions of STI messages, sources, and channels. PMT contends individuals must perceive something as risky or harmful to be motivated to protect oneself. Rogers asserted that this motivation to protect is behavior inducing. In this case, college students exhibited a preference for receiving fearful, humorous, or informative STI messages via specific sources and

channels. Their expressed preferences were based on perceptions that they could successfully engage in communication (e.g., talking to a friend or peer counselor) or the behavior (e.g., visit the health center, attend a campus voluntary information session) to get the required information (self-efficacy) and the likelihood they would follow the message recommendations from the preferred source and channel (response efficacy). Recognizing the rising incidences of STIs for students age 25 and younger (Bacchus Network, 2006; Summerfield & Steinhoff, 1996) it is imperative they are not only alerted to STI issues and concerns, but also offered possible attitudinal and behavioral options.

The first hypothesis investigated the message type college students would see as the most effective (fearful, informative, or humorous) for receiving information about STIs and with which they would feel most capable following recommendations. Results indicated that the fearful message was seen as the most effective. The informative message scored a close second in level of effectiveness and the humorous message was perceived as least effective. This appears to reflect the findings of Witte (1994) and Sprinkle et al., (2006) who reported threatening messages combined with alternative solutions allows individuals to feel in control. In this case students who read the fearful message were also told where to go to get assistance or more information and when asked whether they would do so, responded they felt persuaded and it was likely. As PMT suggests (Roger, 1975, 1983) perceived risk is a motivating factor especially when delivered via a fearful message combined with message self-efficacy. What was less expected was for the informative message to be perceived as more effective in relaying STI information than the humorous message. This result may be supported by Beaudoin's research (2002) with humor and fear in antismoking ads. He reported enhanced effectiveness with humor in youth-oriented advertising and fear working best for adult-oriented advertising. With the topic of STIs, college students may be considered young adults, as they are typically sexually active and engage in more risky sexual behaviors (Abdullah, et al., 2003; Cheah, 2006; Meekers & Klein, 2002). In addition, this result is in line with Booker's (1981) study reporting more positive effects for straightforward information and humor messages. Ultimately, these results appear to indicate that although fearful messages were perceived as most effective it may be prudent to blend the use of fearful with informative STI messages. A mix of channels increases the exposure of the messages by giving students options on how they would like to receive the information (Metzler, Weiskotten, & Morgen, 2000).

The results of hypothesis one are also supported by the findings for hypothesis two where, in most cases, little mean differences were discovered for preferred message type with specific sources and channels. The effectiveness of humorous messages, however, was consistently perceived to be less effective, indicating it should not be considered the sole message type to use in conveying STI warnings to college students. Prevention educators should consider this finding when developing STI campaigns.

The second hypothesis predicted differential source and channel preference for the three STI messages. Students reported differential message preferences for some locations or channels. In the two larger locations, health fair and dorm lobby, students preferred to receive STI education in a straightforward, informative manner. However, in the large lecture classroom, they perceived fearful messages would be effective. Though this result is somewhat curious, the humorous message type received a very similar mean ranking, indicating, perhaps, that students desire or expect professors in their large lecture courses (100-300 students) to offer a more dramatic presentational style by incorporating humor or even threats. These results also appear to confirm Cheah's (2006) focus group findings where students indicated an overall desire for a

variety of channels to receive STI information. With student responses in the present study, it appears they visualize some benefits of each message type depending on the particular location.

In regard to specific sources, however, students did not appear to have a strong preference for message type presented. This is essentially good news for anyone selected to present STI information on campuses as students have no clear expectations of individuals offering the message. Campus posters were the only source students appeared to perceive needing a more informative approach. Within this source, the significant ranking difference between informative, and humorous and fearful is important as campus health officials frequently place signs around campus to warn students about STIs. The preference for posters disseminating informative messages lends support to Cheah's (2006) findings that students preferred to anonymously receive the information on campus via posters and pamphlets in "community" bags. Ultimately, however, Cheah reported they expressed an overall desire to avoid STI discussions.

With the desire for anonymity, it is important to note the value placed on credibility as discovered in the qualitative portion of the study. This student sample does not want to see jokes made or threats delivered about various sexually transmitted infections. When they read it on a poster they want the facts. They view this as more credible. This could be related to their desire to feel comfortable when receiving STI messages (Cheah, 2006). According to these results they prefer a straightforward presentation combined with some fear tactics. Earlier research by Booker (1981) reported more positive effects for the straightforward message in specific and public contexts. In this environment, humor may simply seem inappropriate and messages less credible when used to communicate STI prevention and risk messages.

More specifically, in regard to credibility of valued sources in the open-ended responses, participants revealed they would believe someone who had specific education or certification in this area, such as a doctor, certified peer health educator or health center official. These results suggest campuses should consider highly credible sources such as these when communicating with students about STIs because the messages will be perceived as more effective with students more likely to seek out information and assistance. Comfort level with source was also a concern for participants. Many explained that people like orientation advisors are sources they barely know and they need more time to get to know someone before talking about such personal information. As previous studies have indicated (Cheah, 2006) college students preferred not to discuss their sexual health, but a direct link exists between information seeking and safer-sex behavior (Afifi & Weiner, 2006). PMT presents the pivotal role of efficacy, making it imperative for students to understand the risk and realize their behavioral options. Colleges and universities, therefore, need to determine the appropriate time for a source to discuss these types of messages. A relationship needs to be developed first before using what students feel might be a less credible source. The final qualitative theme, exposure, was primarily linked to posters as a source. Many students thought posters would work if they were linked to other sources like peer educators or utilized to advertise not only the message but an event where more information would be provided—again, linking the message to perceived self-efficacy and response efficacy.

Student rankings for preferred channel also produced interesting results as students provided open-ended responses to justify selections. In regard to a concern for their own comfort level, students made statements like,

In a large group it wouldn't be embarrassing to hear, but in a small classroom I wouldn't feel comfortable with just a few people.

You see these people you live with everyday and would be more reluctant to ask questions.

With channel familiarity and exposure capabilities, typical responses were statements such as, *I would feel most comfortable in a surrounding I am most at home in like my dorm lobby. Every student is expected to go to orientation therefore every student will have to hear STI information.*

The qualitative results concurred with those in previous studies (Metzler et al., 2000; Perreira et al., 2002) that, overall, students prefer a variety of channels. There was great variety in locations students perceived they would feel comfortable, thus using many channels to increase exposure could result in student attentiveness and understanding.

Limitations and Conclusions

The importance of STI education is supported by the growing number of students at risk and the abundance of studies regarding the issue (Summerfield & Steinhoff, 1996; Synovitz et al., 2002). Focusing on education and prevention can be very beneficial to anyone whether or not they are sexually active. However, though the importance of education is recognized by the research literature, the current study did not ask participants if they felt STIs were a problem on their campus or if they felt a need for more education about STIs and prevention. Students were asked to evaluate a hypothetical message in a particular context. It is possible, if they have no concern for STIs, that imagining such a scenario was difficult or unrealistic. In addition, several messages for each message type could have been used in order to avoid any confusion students may have had based simply on the message content rather than type. A final limitation, as with many studies, was sample size. More participants will only make a study more generalizable and expanding the number of participants above 150 could produce stronger conclusions.

The results of this study open the door to future endeavors that would help researchers understand what students see as the most effective modes of education about STIs. Universities and colleges could use these findings as a pilot study for the internal development of campus health campaigns. Future research could test the effectiveness of mixed message campaigns as well as the effectiveness of the sources and channels used to send them. A pre-test / post-test measuring students' STI knowledge and responses toward STI messages might also be a profitable future investigation to better determine if the campaigns are successfully educating them.

Though this quasi-experiment was specific to the university in the study, it is important to note that the survey instrument was designed to be easily adapted to any campus and their available resources. Overall, it can provide a starting point for university officials when trying to develop educational programs or health campaigns about STIs on campus. The conclusions revealed significant differences in levels of effectiveness with each message type; students felt more comfortable and capable of taking action with messages from specific sources and in particular contexts. Using informative and fearful message types in a blended manner could prove most effective as well as educational. The humorous message may be most helpful in a secondary, supportive role with them. The qualitative data may, itself, serve as an educational tool as it revealed participants saw some importance in receiving an STI education via specific channels and sources. Protection motivation theory (Rogers, 1975, 1983) provides a lens to help university sexual health educators understand how to frame and present STI education and prevention materials to appeal to the greatest number of college students.

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Appendix

Fearful Message

Since 1 in 4 students at _____ (insert name of school) are infected with sexually transmitted infections, that means:

- 8 students in your _____ (insert class name) are infected.
- 12 students riding on the bus are infected.
- 100 students in your large lecture are infected.
- 7000 students at _____ (insert name of school) are infected.

Scared? You should be. Are you protected?

To get more information about Sexually Transmitted Infections (STI's) contact the _____ (insert name of student health center and phone number) or make a visit Monday, Wednesday, or Friday from 8 A.M-5P.M or Tuesday and Thursday between 9 A.M. and 6 P.M.

Informative Message

Sexually Transmitted Infections (STI's) are one of the top health issues concerning people ages 18-25.

STI's can be transmitted from one individual to another through sexual activity such as vaginal, oral, or anal intercourse as well as digital manipulation. The most effective way to

reduce transmission is the use of latex protection. The only protection that is 100 percent is abstinence.

To get more information about Sexually Transmitted Infections (STI's) contact the _____ (insert name of student health center and phone number) or make a visit Monday, Wednesday, or Friday from 8 A.M.-5P.M or Tuesday and Thursday between 9 A.M. and 6 P.M.

Humorous Message

Bag It Before You Shag It

Wrap It Before You Tap It

Don't Be Silly, Protect Your Willy

However you want to say it, protect yourself from Sexually Transmitted Infections (STI's). But like they say, practice makes perfect; so next time your at the grocery store pick up an extra banana.

To get more information about Sexually Transmitted Infections (STI's) contact the _____ (insert name of student health center and phone number) or make a visit Monday, Wednesday, or Friday from 8 A.M.-5P.M or Tuesday and Thursday between 9 A.M. and 6 P.M.