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Designing Safer Sex Infographics: Framing Data with Emotional and Rational Appeals

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Designing Safer Sex Infographics: Framing Data with Emotional and Rational Appeals

Yi Wang, Ph.D.

University of Connecticut, 2015

This study compares the effects of two safer sex infographic message strategies on American college students: the traditional social cognitive intervention approach (SC) versus the SC plus emotional intervention approach (SCE). An experiment was conducted to examine how message framing (gain-framed versus loss-framed) and data representation (rational versus emotional) embedded in the infographics influence health message processing, perceived severity of not using a condom, and condom use intention. Across all conditions, sexually inactive participants reported a significantly higher intention to use a condom compared to the sexually active participants. Among sexually active participants, SCE approach led to significantly higher condom use intentions compared to the SC approach. Moreover, the ratio of affect and reason, which indicates the emotional involvement of information processing, was a significant predictor of condom use intention among sexually active participants. Sexually inactive participants, on the other hand, indicated more self-referencing and outcome involvement for the cognitive intervention infographics with rational visual appeals, compared to the emotional intervention infographics with rational visual appeals. They also paid more attention to the cognitive intervention infographics. Implications for these results as well as differences in condom use intentions between the sexually active participants and inactive participants are discussed.

Designing Safer Sex Infographics: Framing Data with Emotional and Rational Appeals

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Designing Safer Sex Infographics: Framing Data with Emotional and Rational Appeals

Doctor of Philosophy Dissertation

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Chapter 1

Introduction

Social campaigns have been widely practiced and studied in shaping the public's understanding and responses on health issues. Information selection and information representation are important choices governing successfully designed social campaigns. For instance, one might consider different content strategies for designing a safer sex social campaign: emphasizing getting a sexually transmitted infection as the consequence for not using a condom, or envisioning the anticipated emotional consequences of unprotected sex. Furthermore, after selecting the right strategy, how to frame the message and present the evidence are also important choices to be made. With new forms of content and new information transmission channels becoming popular on the internet, health campaign planners are taking the opportunity and challenge to reach more audiences, and infographics are among the most popular online content to circulate.

Infographics, known as graphic visual representations of data and information (Lankow, Ritchie, & Crooks, 2012), have recently evoked attention in both news industry and online marketing. Data visualization and visual storytelling are not new ideas. The history of infographics date back to ancient times in the form of charcoal illustrations and carvings to communicate information (Lankow et al., 2012). However, the internet has facilitated a revolution in producing and gathering all kinds of data, which leads to a vital need for data mining and data visualization. Therefore, infographics that could effectively communicate insights from data have become valuable and socially shareable content on social networking sites.

According to BuzzSumo, a new search tool company specialized in providing information on social shares and content circulation in social networking sites, infographics are among the most shared formats of the online content (Kagan, 2014). A single infographic is likely to reach up to 15 million people (Mashable, 2013). Therefore, infographics have also been widely used in social marketing for public health. The Centers for Disease Control and Prevention (CDC) encourages the strategic use of infographics (CDC, 2015). A keyword search of “infographic” on CDC website generated over 1000 infographics in total, topics are ranging from “diabetes” to “Ebola hemorrhagic fever,” and more than one infographic for each CDC topic in 2014. For the topic of “global health,” more than 60 infographics were found illustrating the topic from different perspectives.

Well-designed infographics are considered to be relatively simple and affordable, yet powerful ways to communicate quantitative information. Communication from a developmental interactionist perspective, however, is both symbolic and spontaneous by nature (Buck, 2014). Therefore, emotional information can influence information processing and the persuasiveness of the message. However, current infographic design generally lacks consideration of emotional information. While infographic designers widely use elements such as numbers, shapes, symbols and interactive features, emotional information such as emotional facial expressions, emotion-evoking pictures are not among them. When designers emphasize numerical comparisons in the infographics design, the meanings of these comparisons and numbers are not entirely revealed.

To address this issue, the current study manipulates three components of infographic design: information strategies (social cognitive versus emotional), information types (analytical chart versus emotional photo), and information framing (gain-framed versus loss-framed). This study aims to explore the ways to present data in an emotional way, and to compare the effects of

safer sex infographics from different combinations of message strategies, message framings, and data representations.

Chapter 2:

Literature Review

Emotional Intervention in Safer Sex Intervention

Young adults, including college students, are the population at greatest risk for sexually transmitted infections (STIs). According to 2013 National Data for Chlamydia, Gonorrhea, and Syphilis, young people aged 15-24 accounting for half of the 20 million new STIs, which costs almost 16 billion in health care (CDC, 2014).

Health interventions addressing social and cognitive determinants of behavior are generally effective in improving rates of condom use in young people (e.g., Ajzen, 1991; Fishbein & Ajzen, 2009; Gong et al., 2009). These interventions were guided by models such as the Theory of Reasoned Action (Fishbein & Ajzen, 2009), the Theory of Planned Behavior (Ajzen, 1991), and the Protection Motivation Model (Gong et al., 2009). In addition to the social cognitive intervention approach, Ferrer, Fisher, Buck and Amico (2011) conducted a longitudinal study to examine the effects of adding an emotional education intervention component to a traditional social-cognitive safer sex intervention. They found that both the social-cognitive (SC) intervention and the social-cognitive-emotional (SCE) intervention increased condom use similarly at three months' post-intervention. However, participants in SCE intervention group reported more condom use than participants in the SC intervention group and the control group at six months' post-intervention (Ferrer et al., 2011).

This emotional intervention approach was developed based on the concept of emotional education from the Developmental Interactionist (DI) Theory of Emotion (Buck, 1985, 1988, 1999, 2014). According to the DI theory, interactions between reason and emotion occur through

the course of normal individual development, and labeling and understanding feelings are most prominently learned in childhood. Therefore, emotional education is a teaching process of recognizing and understanding experienced emotion correctly and developing the right coping strategies. Emotional education is essential for child development and has been proposed as an intervention technique to change adult behavior (e.g., Buck, 1985, 1990; Ferrer et al., 2011; McWhirter, 1995). It is reasoned that, if people could correctly associate specific emotions to different situations, they could then anticipate how they will feel in a given situation more accurately.

Plenty of research has suggested that emotion influences health message processing (Peters et al., 2006). In particular, the anticipation of a future emotional state might also influence decision-making (Wilson & Gilbert, 2005). For instance, research has found that anticipated regret was more predictive than perceived risk on the decision to engage in a health-promotion behavior (Abraham & Sheeran, 2004; Chapman & Coups, 2006). In Ferrer et al. (2011)'s emotional intervention, condom use is associated with positive emotions such as loving and caring, but also with lower intimacy; by contrast, condom non-use is linked to negative emotions such as guilt and fear, but also with greater erotic feelings.

Anticipated emotions were embedded in an informal conversation in the intervention videos in Ferrer et al. (2011)'s study. Infographics, on the other hand, can present emotional information explicitly by using graphics, charts, and texts. Therefore, by presenting emotional information explicitly, emotional intervention through infographics might bring an immediate impact on participants' condom use intentions. Based on the literature mentioned above on emotional intervention, it is hypothesized that:

Hypothesis 1: SCE model-based intervention will be more efficacious compared to SC intervention in encouraging condom use during sex.

Research Question 1a: How do intervention strategies influence information processing (e.g., attention, emotional responses, self-referencing and outcome relevance evaluation) after viewing the infographic?

Research Question 1b: How do intervention strategies influence perceived severity of not using a condom after viewing the infographic?

Health Message Framing Effects

In the context of health message design, it is also important to consider how to deliver the message. One of the major foci in this tradition involves the choice of using gain-framed versus loss-framed health messages. Therefore, the second aspect of the study looks at the framing effects on the health messages and the interactions between different framing and message strategies.

Gain and Loss Framing

Gain and loss framing refer to emphasizing either the benefits or the costs of an act in a message. While gain-framed messages focus on the rewarding behavioral consequences of compliance with the encouraged actions, loss-framed messages concentrate on the cost of not adopting it. For example, for the same goal of increasing exercise, a gain-framed message would be “Exercising can help you reduce the risk of developing heart disease.” On the other hand, a loss-framed message would be “Not exercising can increase the danger of developing heart

disease.” Message frames influence people’s risk perceptions and the subsequent choices, was originated out of the Prospect Theory (Kahneman & Kahneman, 1979).

Through a set of decision problem experiments, Tversky and Kahneman (1981) found that people are not always rational decision-makers who favor the prospect with the highest expected utility. Instead, people are influenced by the changes of perspective such that gain decision frames often lead to risk-averse choices and loss decision frames often result in risk-taking choices. When choosing from two options, one with little risk and the other one with some higher degree of risk, people are influenced by how the information is framed. If both choices are framed in potential losses, then individuals are more likely to choose the later to prevent the bigger losses. However, if both choices are framed to emphasize potential gains, individuals are more willing to accept the gains with little risk.

Rothman and Salovey (1997) applied this Theory to message framing to motivate healthy behavior. They explained the failures to find an advantage for either frame in health recommendations and suggested that the context in which the message is received such as prior perceptions about a health issue must be taken into consideration. Along with this, they categorized health behaviors into three functions: health prevention (e.g., condom use), health detection (e.g., cancer screening), and health treatment (e.g., chemotherapy). Although health detection behaviors are considered to have a high degree of risk or uncertainty associated with them, health prevention and treatment behaviors are considered as affording relatively safe or certain outcomes. Therefore, based on this distinction, people should be more likely to take risks of illness detection when viewed the loss-framed messages, but more liable to engage in illness prevention behaviors when consequences are framed as gains. They further suggest that

behavioral type should serve as a heuristic to determine whether a behavior is perceived as risky or safe.

In recent meta-analytical studies comparing studies based on behavioral types (prevention versus detection), gain-framed messages are more effective than loss-framed messages in encouraging prevention behavior. However, the effect size is relatively small (e.g., $r = 0.083$, Gallagher & Updegraff, 2012). On the other hand, loss-framed messages show no advantage for motivating detection behaviors, in general. Updegraff and Rothman (2013) suggested that behavioral types of detection versus prevention moderate the framing effect, but individual beliefs about health behavior might be the main factor underpinning behavioral types. Latimer, Salovey, and Rothman (2007) suggested that the impact of framed message appeals should be studied suited to the individuals (Latimer, et al., 2007). Along these lines, two major approaches to study health message framing have been proposed: matching the message frame to an individual's perceived risks and uncertainties of the advocated health behavior, and matching the message frame to message recipient's motivational orientation (Updegraff & Rothman, 2013). Therefore, there is no simple answer regarding the effectiveness of the gain or loss-framed message, but the combined moderating effects situated in different contexts.

Research has found that people's risk-related belief interact with framing to influence intentions to adopt a healthier behavior (e.g., Gallagher, Updegraff, Rothman, & Sims, 2011; Hull, 2012). Using a randomized controlled trial, Hull (2012) found a significant interaction between message frame and perceived risk on HIV-testing promotion messages. He found that the loss-framed message demonstrated an advantage over the gain-framed message among women with certain perceived risks; for women with low perceived risk, the gain-framed message revealed an advantage. Gallagher et al. (2011) studied the role of perceived

susceptibility to breast cancer in moderating mammography. They found that, among women who perceive high susceptibility to breast cancer, a loss-framed message had a better persuasive effect in promoting mammography, however, no framing effect was found for women with low susceptibility (Gallagher et al., 2011). Similar moderation effects have also been found in HIV-testing promotion messages (Apanovitch, McCarthy, & Salovey, 2003). Apanovitch et al. (2003) found that gain-framed messages led to a higher rate of HIV testing among women who are certain about the test result. Loss-framed messages, on the other hand, were more effective among women who are relatively uncertain about the test outcome.

The evidence for the moderating role of risk-related beliefs seems clear. However, the underlying processes of why this pattern emerged have not been well studied. Updegraff and Rothman (2013) suggested that elaboration and emotions might be the two major mediators explaining the real processes.

Elaboration, Emotion, and Framing Effects

Excessive research has explored the role of elaboration and emotion in information processing. As suggested by Briñol and Petty (2006), the amount of thinking based on issue-relevant elaboration influences attitudes stability and prediction of behavior. However, message quality also moderates the effects of elaboration on behavioral intention: if a message is found to be outdated or problematic, then, greater elaboration could, in fact, reduce persuasive effects. Hull (2012) suggested that message elaboration also mediates the interaction between message frame and perceived risk. In his study, women who perceived some risk for HIV reported more

thinking than feeling for a loss-framed message, compared to women who perceived no risk for HIV.

Emotion is another potential mediator. Although consciousness has been assumed in most framing effects research, people can react to potential risks through an emotional route rather than the cognitive route. Therefore, people may encode the consequences of different actions with specific emotions such as happiness, sadness, and fear (Updegraff & Rothman, 2013). As a result, positive or negative framing may activate emotional associations with health issues or behaviors, thus mediating the framing effects on behaviors.

The role of emotion in amplifying and attenuating the effect of message framing has been studied in previous research in multiple contexts. Druckman and McDermott (2008) found that anger and enthusiasm can decrease the association between gain-framed messages and risk-aversion political behavior while distress has the opposite effect. Yan, Dillard, and Shen (2010) uncovered mood congruency effects in processing health messages. They found that gain-framed messages were most effective for individuals in a positive mood while loss-framed messages were most effective for individuals in a negative mood (Yan et al., 2010). However, these results focus on immediate emotions, which are incidental and unrelated to the decision (see Loewenstein and Lerner, 2003).

Other studies investigated how boosting the affective experience associated with the framed message could potentially influence the persuasive effects (e.g., Chang & Lee; 2009; Ferrer et al., 2012). Chang and Lee (2009) suggested that the advertising effectiveness of a charitable appeal was enhanced when the framed messages are paired with a valence-congruent affective image, especially when the image and the message are both presented negatively. In another context, Ferrer her colleagues (2012) found that individuals who received an emotional

booster with the gain-framed message, but not the loss-framed message, demonstrated higher behavioral intentions for colorectal cancer screening after viewing the messages.

Since emotional interventions emphasize the emotional components of framing effects, the emotional components might, therefore, act as the affective boosters, thus improving the effectiveness of the messages. However, it is unclear how message framing interacts with the intervention strategies.

Therefore,

Research Question 2: How do message framing and intervention strategies together influence condom use intention?

The Effects of Rational vs. Emotional Representation of Data

The last aspect of the study looks at how to present information on the infographic to be more effective, in a rational way or in an emotional way.

The Elaboration Likelihood Model (ELM) and the Heuristic-Systematic Model (HSM) are information dual-processes models that have been applied in advertising and marketing research. Dual-process models posit two separate routes: a high-effort central and systematic route and a low-effort peripheral and heuristic route (Cacioppo & Petty, 1984; Chaiken, Liberman, & Eagly, 1989). Research has suggested that while analytical information tends to trigger central route of information processing, emotional information tends to trigger the peripheral route of information processing. Based on this analysis, analytical information requires more cognitive effort, therefore, results in greater elaboration. Recall from the evidence

of Hull (2012)'s study that women who perceived certain risk for HIV reported greater elaboration of the loss-framed message compared to those who perceived no risk for HIV: people's risk perception might influence which route of information processing one might engage, thus influencing the framing effects. On the other hand, based on the dual-process models, emotional information might be salient for people who perceive low risk and, therefore, enter the peripheral route of information processing.

However, the concept of "routes" was indeed conceptual, and people might adopt a combination of central and peripheral processes together. Buck (1985, 1999, and 2014) proposed a developmental-interactionist theory of emotion that examined behavior in a developmental context as a consequence of interactions between affect systems and analytic reasoning system. Buck and Chaudhuri (1994) proposed the syncretic Affect-Reason-Involvement model (ARI). The ARI model explains the relationships among affect, reason, and involvement, where involvement is defined as a combination of affective and cognitive processing. Instead of having two processes as in dual-processes models, ARI operationalizes levels of involvement as $(\text{Affect} + \text{Reason}) / 2$. They further propose that there will be three processing states: "hot processing," "cold processing," and "indifference" (Buck & Chaudhuri, 1994). In this model, affect is to be assumed present in all situations, even in a highly analytical attentive situation, while the influence of reason varies from zero to a high end. In "hot processing," there will be a high A/R ratio, which indicates high affect and high involvement. In "cold processing," there will be low A/R ratio, which indicates high reasoning and high involvement. Lastly, in "indifference," there will be low affect and reason and therefore, low involvement. In the ARI model, there are no separate routes, but different processing states or possibilities based on the situation and interactions between affect and reasoning.

Most prior framing studies have focused on high personally relevant health topics and mostly in rational informative contexts, therefore, likely resulting in cold processing (Buck & Chaudhuri, 1994). Condom use, on the other hand, involves both levels of personal relevance: sexually active participants might perceive higher personal relevance, and sexually inactive participants might perceive lower personal relevance. Therefore, based on the literature, while sexually active participants might engage in cold processing and prefer rational appeal infographics, sexually inactive participants, on the other hand, might engage in hot processing and prefer emotional appeal infographics.

Based on these assumptions, we posit that,

Hypothesis 3a: Sexually active participants will report higher perceived personal relevance than sexually inactive participants after viewing the safer sex infographics.

Hypothesis 3b: Sexually active participants will report higher condom use intentions after viewing rational appeal infographics, compared to the emotional appeal infographics.

Hypothesis 3c: Sexually inactive participants will report higher condom use intentions after viewing emotional appeal infographics, compared to the rational appeal infographics.

Research Question 3: What are the factors predicting condom use intention among sexually active participants and sexually inactive participants?

Chapter 3

Methodology

An online experiment was conducted to test the hypotheses and explore the research questions with a college students sample. Online experiments are considered a reliable method with a high degree of external validity for participants to perform complex experimental tasks (Dandurand, Shultz, & Onishi, 2008). As college students are among the highest risk subpopulations at greatest risk for STIs, the student sample is a relevant target audience for safer sex infographics.

Participants

Around 500 college students from the University of Connecticut Communication Department participant pool completed the online experiment. The final sample included 230 male and 230 female participants. An information sheet with the link of the study was posted on the participation pool website, and students in the pool self-selected to participate. Participants received research credit points for taking the survey anonymously and were taken to a separate survey at the end to enter their identification information to obtain course credit. The University of Connecticut's Institutional Review Board approved the study. The information sheet can be found in Appendix A.

Procedure

A nested design was employed to test eight different infographics with different combinations of intervention approaches, visual message appeals, and message frames. Among the four infographics focused on the emotional intervention approach, the two “emotional appeal” conditions included an emotion-evoke infographic matched with either a gain-framed or

loss-framed message; while the other two “rational appeal” conditions included a data-driven infographic matched with either a gain-framed or loss-framed message. See Appendix B (Figures 8-11).

For the four infographics focused on the cognitive intervention approach, the same combination logic applied: the two “emotional appeal” conditions included an emotion-evoke infographic matched with either a gain-framed or loss-framed message; while the other two “rational appeal” conditions included a data-driven infographic matched with either a gain-framed or loss-framed message. See Appendix B (Figures 12-15).

Participants were randomly assigned to one of the eight study conditions; each study condition was associated with a different infographic. The survey started with basic demographic information--such as gender and age--and continued with questions regarding their sexual behaviors. Afterward, participants viewed one infographic. Assessments of attention, self-referencing and outcome relevant evaluation, motivations, and the effectiveness of the infographic were conducted after the exposure of the infographic. The questionnaire can be found in Appendix C.

Intervention Content

The **traditional social cognitive intervention** was based on protection motivation model targeting risk-related cognitive beliefs. For the data-driven infographics, a chart showing the percentages of chlamydia and gonorrhea infections based on age groups is the major visual appeal. On this chart, 15-24-Year-Olds are among the most reported chlamydia and gonorrhea affections. Underneath the chart, the gain-framed message targeted the benefit of the use of a condom (Figure 12) while the loss-framed message targeted potential risk of contracting an STI

unknowingly if a condom is not used (Figure 13). For the emotion-evoking infographics, instead of having the chart, photos of two happy couples (Figure 14) and a sad male and female (Figure 15) are placed in the gain-framed infographic and loss-framed infographic, respectively. These photos represent the positive outcome of effectively preventing STIs and the negative consequence of contracting an STI unknowingly. However, none of the specific anticipated emotions is identified in these two emotion-evoking conditions.

The **emotional intervention** approach is built upon the traditional cognitive intervention approach. In this approach, emotional education (Buck, 1985; 1990) is implemented to help individuals to recognize and anticipate emotions involved in sexual situations with the hope that emotional competence will lead to safer sexual behavior.

For the data-driven infographics, a bubble chart showing the emotions one would feel using or not using a condom replaces the bar chart on the cognitive intervention infographics. These two charts for the gain-framed and loss-framed infographic were created based on evidence found in Buck et al.'s (2004) study.

The chart displays three dimensions of data: negative versus positive on X dimension, selfish versus prosocial on Y dimension and the reported popularity of each particular emotion, through the size of each bubble.

For both the gain-framed and the loss-framed data-driven infographic, eight emotions associated with sexual situations are depicted in eight bubbles different in both color and size: loving, caring, intimate, powerful, erotic, satisfied, fear and shame. These emotions are selected from the SAFECOMM-05 scale (Buck, Anderson, Chaudhuri, & Ray, 2004). Among the eight emotions, “loving” and “caring” are plotted as high on both prosocial and positive scale;

“intimate” is plotted within the prosocial and positive region, but lower in both dimensions; “satisfied,” on the other hand, is plotted as positive but more towards the selfish dimension. For the negative emotions, “shame” is plotted as high on prosocial but falls within the negative realm; “fear” is plotted within both the selfish and negative realm. Other than these emotions, “powerful” and “erotic” are plotted around the mid-range for both the positivity and prosocial dimensions.

The gain-framed infographic emphasizes the positive emotional outcomes, such that loving and caring are experienced when a condom is used during sex. Therefore, loving and caring, which situate on the positive and prosocial end of emotion, are shown both in text and in the bubble chart in warm colors and dominating size. On the other hand, shame and fear are represented in the small bubbles, since people are less likely to experience such emotions when a condom is used during sex (Figure 8).

The loss-framed infographic emphasized the negative emotional outcomes, such that shame and guilt are experienced when a condom is not used during sex. Therefore, shame and fear, are shown both in text and in the bubble chart in cold colors and dominating size. On the other hand, loving and caring are represented in the small bubbles, since people are less likely to experience such emotions when a condom is not used during sex (Figure 9).

For the emotion-evoke infographics, instead of having the chart, the same photos of two happy couples and a sad male and female are placed in the gain-framed infographic and loss-framed infographic respectively. However, instead of only describing the positive outcome as “effective preventing STI” and “contracting an STI unknowingly” as in the cognitive only intervention infographics, emotional outcomes are identified and emphasized. Thus, loving and

caring are identified and emphasized in the gain-framed message (Figure 10), while shame and fear are identified and emphasized in the loss-framed message (Figure 11).

Manipulation Check

A separate sample of 30 participants completed the manipulation check survey. The manipulation check used a within-subject design, and the eight infographics were presented to the participants in random sequences.

First, participants were asked to evaluate the visual images (chart vs. photo) on the infographic on three counterbalanced 7-point scales (1=rational and 7=emotional; 1=analytical and 7=intuitional; 1=logical and 7=affective). The Cronbach's alphas range from .75 to .915 across eight evaluations. An average score across the three items was created for each assessment. Paired sample t-tests were conducted between four pairs of infographics. The first pair was between the emotional intervention, emotional appeal and gain-frame condition (EEG, $M=5.21$, $SD=1.20$) versus the emotional intervention, rational appeal and gain-frame condition (ERG, $M=4.03$, $SD=1.50$), $t(29)=3.46$, $p=.002$. The second pair was between the emotional intervention, emotional appeal and loss-frame condition (EEL, $M=5.20$, $SD=1.52$) versus the emotional intervention, rational appeal and loss-frame condition (ERL, $M=3.83$, $SD=1.70$), $t(29)=3.91$, $p=.001$. The third pair was between the cognitive intervention, emotional appeal and gain-framed condition (CEG, $M=4.43$, $SD=1.58$) versus the cognitive intervention, rational appeal and gain-framed condition (CRG, $M=2.56$, $SD=1.30$), $t(29)=5.40$, $p<.000$. The last pair was between the cognitive intervention, emotional appeal and loss-framed condition (CEL, $M=4.68$, $SD=1.82$) versus the cognitive intervention, rational appeal and loss-framed condition (CRL, $M=2.84$, $SD=1.50$), $t(29)=4.12$, $p<.000$. Hence, the emotional appeal visual image conditions

across all pairs were rated significantly more emotional and intuitional than the rational appeal visual conditions ($p \leq .0002$).

These participants then evaluated the loss- and gain-frame messages that were counterbalanced by three 7-point scales (1= negative and 7= positive; 1=cost and 7= benefit; 1=loss and 7= gain). The Cronbach's alphas range from .69 to .93 across eight evaluations. An average score across the three items was created for each assessment. Paired sample t-tests were conducted between four pairs of infographics. The first pair was between the emotional intervention, emotional appeal and gain-frame condition (EEG, $M=5.52$, $SD=1.10$) versus the emotional intervention, emotional appeal and loss-frame condition (EEL, $M=3.23$, $SD= 1.88$), $t(29) = 5.29$, $p < .000$. The second pair was between the emotional intervention, rational appeal and gain-frame condition (ERG, $M=4.74$, $SD= 1.46$) versus the emotional intervention, rational appeal and loss-frame condition (ERL, $M=2.93$, $SD= 1.70$), $t(29) = 4.10$, $p < .000$. The third pair was between the cognitive intervention, emotional appeal and gain-framed condition (CEG, $M=5.10$, $SD= 1.25$) versus the cognitive intervention, emotional appeal and loss-framed condition (CEL, $M=3.32$, $SD= 1.88$), $t(29) = 4.66$, $p < .000$. The last pair was between the cognitive intervention, rational appeal and gain-framed condition (CRG, $M=3.50$, $SD= 1.63$) versus the cognitive intervention, rational appeal and loss-framed condition (CRL, $M=3.41$, $SD= 1.72$), $t(29) = .33$, $p = .75$. Except for the last pair of the cognitive intervention with rational appeal infographics, gain-framed infographics in all of the other three conditions were rated significantly more positively than the loss-framed message ($p < .000$). Since the charts on the cognitive intervention with rational appeal infographics are identical with factual information regarding the vulnerability of the young adult population, unlike the emotional appeal visual infographics, the framing effects might only be revealed in the text. Previously, research has

found that there is no difference in persuasiveness for gain- or loss-framed messages in text-only cigarettes warning labels (Zhao, Nan, Yang, & Iles, 2014). Moreover, since the participants evaluated the whole infographic, they might just focus on the charts and not fully process the text below the chart.

The result from another check on the perceived framing among all the participants was consistent with the previous finding. However, although not significant, participants who viewed the CRG message rated the infographic slightly higher above the neutral point ($M = 4.24$, $SD = 1.60$), while participants who viewed the CRL message rated the infographic slightly below the neutral point ($M = 3.98$, $SD = 1.67$).

Overall, the manipulation worked.

Measures

Except where noted, seven-point Likert scales were used.

Information Processing Variables

Analytical processing was measured by three items adapted from previous studies (Buck, Chaudhuri, Georgson, & Kowta, 1995). The scale items were: “How much do you think logically while viewing the infographic?”, “How much do you analyze the pros and cons of using or not using a condom while viewing the infographic?”, and “How much do you reason about the facts associated with using not using a condom while viewing the infographic?” (“not at all” to “very much”) ($\alpha = .72$).

Emotional processing was measured by three items adapted from previous studies (Buck et al., 1995). The scale items were: “How strongly do you feel while viewing the infographic?,” “How much does this infographic appeal to your intuitions about using or not using a condom?,” and “How much does this infographic appeal to your instincts about using or not using a condom?” (“not at all” to “very much”) ($\alpha = .66$).

Emotional responses were measured by the SAFECOMM-05 scale (Buck et al., 2004). Participants circled the level of each emotion they felt when viewing the infographic. These emotions included: Loving/Loved, Caring, Nurturing, Afraid, Embarrassed, Satisfied, Confident, Secure, Angry, Hostile, Hateful, Isolated, Lonely, Sad, Vigorous, Energetic, Powerful, Erotic, and Aroused. An exploratory factor analysis yielded five subscales. Reliabilities were: positive prosocial (three items, $\alpha = .90$); negative prosocial (six items, $\alpha = .83$); positive individualist (three items, $\alpha = .79$); negative individualist (three items, $\alpha = .85$); and reptilian (four items, $\alpha = .84$). See Table 1.

Attention. After viewing the infographic, participants were asked to report their attention by rating five statements adapted from previous studies (e.g., Green & Brock, 2000; Zhang, Chock, Chen, & Wang, 2014). The five statements were: “I paid close attention to the infographic while watching it,” “During viewing, I didn’t let myself get distracted from focusing on the message content,” “I found my mind wandering while viewing the infographic (reverse coded),” “I was mentally involved in the infographic while watching it,” and “After viewing the infographic, I found it easy to put it out of my mind (reverse coded)” (“Strongly disagree” to “Strongly agree”) ($\alpha = .80$).

Self-referencing and outcome-relevant involvement was assessed by five items adapted from previous studies (e.g., Green & Brock, 2000; Zhang, Chock, Chen, & Wang, 2014). The

five statements were: “How much did this infographic make you think about yourself?,” “How much did this infographic make you think about your own risk for having sex without a condom?,” “To what extent did you think the infographic was related to you personally?,” “To what extent did you think the infographic would affect you personally?,” and “To what extent were you reminded of your own potential sexual encounters while viewing the infographic?” (“not at all” to “very much”) ($\alpha=.88$).

Protection Motivation Model Constructs

Perceived severity of not using a condom was assessed by three items modified from Kang and Lin ’s (2015) study. These items include: “I would be concerned, if a condom is not used during sexual intercourse,” “I think that not using a condom during sexual intercourse is dangerous,” and “I believe that not using a condom during sexual intercourse can lead to serious health problems” (“ Strongly disagree” to “Strongly agree”) ($\alpha=.82$).

Extrinsic Rewards for not using a condom was measured by three items adapted from Wang et al., (2009)’s study. These items include: “How often do you think your peers use a condom with stable sexual partners?,” “How often do you think your peers use a condom with casual sexual partners?,” and “How many of your peers think that they should use a condom consistently?” ($\alpha=.71$).

Intrinsic Rewards for getting a STI was gauged by three items adapted from Wang et al., (2009)’s study. These items include: “I feel better without using a condom when having sex,” “I feel closer to a sexual partner without using a condom,” and “I feel safe using a condom when having sexual intercourse (reverse coded)” (“Strongly disagree” to “Strongly agree”) ($\alpha=.61$).

Response Costs of getting a STI was gauged by three items adapted from Wang et al., (2009)'s study. These items include: "If I insist on using a condom, the atmosphere of having sex could be interrupted," "If I insist on using a condom, my sexual partner's mood could be interrupted," and "Using a condom can reduce sexual pleasure" ("Strongly disagree" to "Strongly agree") ($\alpha=.79$).

Self-efficacy of getting a STI was measured by three items adapted from Kang and Lin (2015)'s study. These items include: "It is easy to use condoms," "I am not afraid to use condoms," and "I am able to use condoms effectively" ("Strongly disagree" to "Strongly agree") ($\alpha=.85$).

Protection Motivation for getting an STI was gauged by three items adapted from Kang and Lin (2015)'s study. These items include: "I intend to use a condom for myself or on my partner every time there is penetrative sex," "I intend to use a condom to protect myself from getting STIs," and "I would ensure that my partner or I have a condom to use before penetrative sex" ("Strongly disagree" to "Strongly agree") ($\alpha=.93$).

Demographics

Participants were asked general demographic questions including age, gender, and ethnicity.

Sexual Behavior

Participants were asked whether they are sexually active in the past month.

Chapter 4

Results

Univariate ANOVA tests were used to identify the main effects of intervention message strategies, message framing, and message visual appeals on condom use intention. Boxplots were used to assess whether there are any outliers, and Shapiro-Wilk's test of normality was used to evaluate whether the assumption of normality has been met in each cell of the design. Homogeneity of variances was assessed by Levene's test. Multiple regression was used to explore the research questions.

Participant Characteristics

Manual data screening was conducted for all the responses submitted in less than five minutes. Participants who did not answer any questions after viewing the infographic and participants who filled out all the questions with the same rating were deleted.

For the final sample (N=460), average participant age was 19.39 years old (SD=1.472); 81.7% of them were freshman and sophomores. An equal number of male and female participants completed the online survey (N=230 for both genders). Additionally, participants consisted of a range of ethnicities including Caucasian (69%), Asian (13.3%), Latino (7.4%), Black or African American (6.1%), American Indian and Alaskan (.4%), Native Hawaiian or other Pacific Islander (.2%) and other (3.5%).

In this sample, 275 students reported being sexually active in the past month (59.8%), and 185 students reported being sexually inactive in the past month (40.2%). Regarding previous

condom use behavior, 153 participants rarely used a condom (33.5%), 98 participants used condom occasionally (21.4%), and 206 participants would always use a condom (45.1%).

Effects on Condom Use Intention

Hypothesis 1 suggested that participants who viewed an emotional intervention infographic would report higher intentions of condom use during sex, compared to participants who viewed a traditional social cognitive intervention infographic.

Hypotheses 3b and 3c suggested that sexually active participants would report higher condom use intention after viewing rational appeal infographics, while sexually inactive participants will report higher condom use intention after viewing emotional appeal infographics.

An ANOVA across all eight conditions revealed no statistically significant differences regarding condom use intentions, $F(7, 449) = 1.97, p = .057$. The Emotional Intervention-Rational Appeal-Gain Framed condition had the highest condom use intention mean score ($M = 5.44, SD = 1.46$), while the Cognitive Intervention-Rational Appeal-Loss Framed condition had the lowest score ($M = 4.51, SD = 1.82$). However, participants who were sexually inactive in the past month demonstrated higher intentions ($M = 5.72, SD = 1.28$) to use a condom during sex, compared to the sexually active participants ($M = 4.65, SD = 1.66$), $t(455) = 7.38, p < .000$. T-test results for each of the eight conditions are displayed in Table 2 (Also see Figure 1).

There was no statistically significant difference in condom use intentions among male ($M = 4.94, SD = 1.56$) and female ($M = 5.22, SD = 1.64$) participants, $t(455) = 1.841, p = .066$. However, for sexually inactive participants, females indicated a significantly higher condom use

intention ($M = 6.03$, $SD = 1.18$) than male participants ($M = 5.36$, $SD = 1.30$), $t(183) = 3.67$, $p < .000$.

This discrepancy suggests that sexually active and inactive participants might indeed engage in different patterns of information processing and that the effects of message strategies on condom use intention might differ based on participants' sexually active status. Therefore, data were split into two subgroups: sexually active and sexually inactive participants.

A 2 (Intervention Strategy) X 2 (Message Framing) X 2 (Visual Appeal) ANOVA was performed on condom use intention, controlling for gender.

For both sexually active and inactive participants, there was homogeneity of variances, as assessed by Levene's test for equality of variances, $p = .345$ and $p = .098$ respectively.

There was a statistically significant main effect of intervention message strategy, $F(1, 263) = 4.82$, $p = .029$, $\eta_p^2 = .018$. The emotional intervention was associated with a mean "Condom Use Intention" score 4.88 ($SD = 1.63$), higher than the cognitive intervention score 4.43 ($SD = 1.67$) (See Figure 2). Therefore, hypothesis 1 was supported among sexually active participants. Since there was no main effect of message visual appeals, Hypothesis 3b was not supported. Therefore, for sexually active participants, using rational visual appeal or emotional visual appeal, makes no difference regarding participants' condom use intentions.

There was also a statistically significant message framing X visual appeals interaction on condom use intention, $F(1, 263) = 4.98$, $p = .027$, $\eta_p^2 = .019$. Therefore, an analysis of simple main effects for visual appeals and message framing was performed. (See Figure 3)

The simple main effect of visual appeals on condom use intention for loss-framed messages was statistically significant ($F(1, 263) = 6.23$, $p = .013$), but not for gain-framed

messages, $F(1, 263) = 0.446$, $p = .51$. A pairwise comparison was made for loss-framed messages with a Bonferroni adjustment. Condom use intention was 4.27 ($SE = .194$) with rational appeal and 4.97 ($SE = .201$) with emotional appeals, a statistical significance difference of .697, 95% CI (.147, 1.247), $p = .013$. None of the simple main effects of message framing was significant.

These effects were not apparent for sexually inactive participants. Instead, there was a significant gender effect on sexually inactive participants, $F(1, 176) = 14.12$, $p < .000$, $\eta_p^2 = .074$. Female participants indicated higher intention to use a condom during sex ($M = 6.03$, $SD = 1.18$) than male participants ($M = 5.36$, $SD = 1.30$). Since there was no main effect of message visual appeal for sexually inactive participants, Hypothesis 3c was not supported.

Therefore, condom use intentions are significantly different between the sexually active participant and inactive participants. For sexually active participants, the emotional plus intervention was significantly more effective than the cognitive only intervention strategy. However, the sexually active status does not influence the preferences of emotional or rational visual appeals. It is also interesting to find that among the sexually active participants, there is a message framing and visual appeals interaction, such that the loss-framed emotional message is more effective than the loss-framed rational message. This effect is consistent with both intervention strategies.

Effects on Perceived Severity of Not Using a Condom

Research question 1b inquired about how intervention message strategies influence perceived severity of not using a condom. To answer this question, a 2 (Intervention Strategy) X 2 (Message Framing) X 2 (Visual Appeal) ANOVA was performed on perceived severity of not using a condom, controlling for gender.

For both sexually active and inactive participants, a homogeneity of variances was observed, as assessed by Levene's test for equality of variances ($p = .402$ and $p = .310$ respectively).

For sexually active participants, there was a statistically significant Intervention Strategies X Visual Appeals interaction on perceived severity of not using a condom, $F(1,263) = 8.14$, $p = .005$, $\eta_p^2 = .03$. Therefore, an analysis of simple main effects for intervention strategies and visual appeals was performed (See Figure 4).

The simple main effect of intervention strategies on perceived severity of not using a condom for emotional appeal messages was statistically significant ($F(1,263) = 4.63$, $p = .032$) and close to significance for rational appeal messages, $F(1,263) = 3.53$, $p = .062$. Pairwise comparisons were made for emotional appeal messages with a Bonferroni adjustment. Perceived severity of not using a condom was 5.48 ($SE = .159$) with cognitive intervention messages and 4.99 ($SE = .163$) with Emotional plus intervention messages, a statistically significant difference of .49, 95% CI (.042, .939), $p = .032$. For rational appeal messages, perceived severity of not using a condom was 4.65 ($SE = .153$) with cognitive intervention messages and 5.06 ($SE = .158$) with Emotional plus intervention messages.

The simple main effect of visual appeals on perceived severity of not using a condom for cognitive intervention messages was statistically significant ($F(1,263) = 14.09, p < .000$), but this was not the case for emotional intervention messages, $F(1,263) = .11, p = .741$. A pairwise comparison was made for cognitive intervention messages with a Bonferroni adjustment. Perceived severity of not using a condom was 5.48 ($SE=.159$) with emotional appeal messages and 4.65 ($SE=.153$) with rational appeal messages, a statistically significant difference of .828, 95% CI (.394, 1.262), $p < .000$.

These effects were not apparent for sexually inactive participants. Gender was again a significant predictor of perceived severity of not using a condom, $F(1,175) = 5.24, P = .023, \eta_p^2 = .029$. Females perceived a higher level of severity of not using a condom ($M=5.93, SD= 1.09$) than male participants ($M=5.57, SD= 1.29$). Sexually inactive participants, in general, reported higher perceived severity of not using a condom during sex.

In summary, in order to increase the perceived severity of not using a condom, it is better to pair the emotional visual appeal with the cognitive intervention strategy and to pair the rational visual appeal with the emotional intervention strategy. This effect is most salient with the cognitive intervention strategy messages, where emotional visual appeal significantly increases the perceived severity of not using a condom, compared to the rational visual appeal, regardless gain or loss message frames.

Effects on Information Processing

Attention

A 2 (Intervention Strategy) X 2 (Message Framing) X 2 (Visual Appeal) X 2 (Sexual Active Status) ANOVA was performed on attention, controlling for gender.

There was homogeneity of variances, as assessed by Levene's test for equality of variances, $p = .21$.

There was a statistically significant Intervention Strategies X Sexually Active Status interaction on attention, $F(1, 439) = 4.4$, $p = .036$, $\eta_p^2 = .01$. Therefore, an analysis of simple main effects for intervention strategies and sexually active status was performed (See Figure 5).

The simple main effect of intervention strategies on attention for sexually inactive participants was statistically significant ($F(1, 439) = 4.38$, $p = .037$), but not for sexually active participants, $F(1, 439) = .571$, $p = .45$. Pairwise comparisons were made for sexually inactive participants with a Bonferroni adjustment. Reported attention was 4.56 ($SE = .132$) with cognitive intervention messages and 4.19 ($SE = .118$) with Emotional plus intervention messages, a statistically significant difference of .371, 95% CI (.023, .720), $p = .037$.

The simple main effect of sexually active status on attention for cognitive intervention infographics was statistically significant ($F(1, 439) = 4.78$, $p = .029$), but not for emotional plus intervention infographics, $F(1, 439) = .546$, $p = .461$. Pairwise comparisons were made for cognitive intervention conditions with a Bonferroni adjustment. Reported attention was 4.19 ($SE = .101$) for sexually active participants and 4.56 ($SE = .132$) for sexually inactive participants, a statistically significant difference of .364, 95% CI (.037, .692), $p = .029$.

These results revealed that while sexually active participants paid more attention to the emotional intervention messages (not a statistically significant difference); sexually inactive participants paid significantly more attention to the cognitive intervention messages.

Emotional Responses

A MANOVA was conducted to examine how intervention strategies influence emotional responses after viewing the infographics. Therefore, negative individualistic, positive individualistic, negative prosocial, positive prosocial, and reptilian emotion were treated as dependent variables, and sexually active status, intervention strategies, message framing, and message appeals were treated as independent variables controlling for sex. There were significant multivariate effects for message framing ($F(5, 451) = 8.88, p < .000$; Wilks' $\Lambda = .911$) and sexually active status ($F(5, 451) = 2.37, p = .039$; Wilks' $\Lambda = .974$) (See Table 3).

Univariate analyses revealed that the significant multivariate effect of message framing was driven by significant relationships between message framing and the dependent variables of negative individualistic emotion ($F(1, 443) = 4.97, p = .026$), positive prosocial emotion ($F(1, 443) = 12.96, p < .000$), positive individualistic emotion ($F(1, 443) = 5.61, p = .018$), and reptilian emotion ($F(1, 443) = 5.82, p = .016$). The significant multivariate effect of sexually active status was driven by significant relationships between sexually active status and the negative prosocial emotion ($F(1, 443) = 6.37, p = .012$) (See Figure 6).

Based on these results, message framing does influence the reported emotions after viewing the infographic. However, it is unexpected that ratings on the negative prosocial emotions, which were emphasized in the loss-framed emotional intervention messages, were not

influenced by different message framing. In fact, sexually inactive participants reported higher negative prosocial emotions, compared to the sexually active participants.

Self-referencing and Outcome Relevance Evaluation

Hypothesis 3a suggested that sexually active participants would report higher perceived personal relevance than sexually inactive participants after viewing the safer sex infographic. This hypothesis was supported such that sexually inactive participants reported lower self-referencing and outcome relevant evaluation score compared to sexually active participants, $F(1, 429) = 8.75, p = .003, \eta^2 = .02$.

Therefore, a 2 (Intervention Strategy) X 2 (Message Framing) X 2 (Visual Appeal) ANOVA was performed on self-referencing and outcome relevant evaluation for both sexually active and inactive participants, controlling for sex. For both sexually active and inactive participants, a homogeneity of variances was observed, as assessed by Levene's test for equality of variances, $p = .772$ and $p = .862$ respectively.

For sexually active participants, there was a statistically significant main effect of message framing, $F(1, 256) = 5.57, p = .019, \eta^2 = .021$. The loss-framed message was associated with a mean "Self-referencing and Outcome Relevance" score 3.68 (SD=1.47), lower than a gain-framed message score 4.09 (SD= 1.51).

No main effect of message intervention was found. However, there was a statistically significant Intervention Strategies X Visual Appeals interaction on self-referencing and outcome relevance evaluation, $F(1, 256) = 4.67, p = .032, \eta^2 = .018$. Therefore, an analysis of simple main effects for intervention strategies and visual appeals was performed (See Figure 7).

The simple main effect of intervention strategies on self-referencing and outcome relevance evaluation for rational appeal messages was statistically significant ($F(1,256) = 4.97$, $p = .027$), but not for emotional appeal messages, $F(1,256) = .706$, $p = .402$. Pairwise comparisons were made for rational appeal messages with a Bonferroni adjustment. Self-referencing and outcome relevance evaluation was 3.62 ($SE = .177$) with cognitive intervention messages and 4.19 ($SE = .184$) with Emotional plus intervention messages, a statistically significant difference of .569, 95% CI (.066, .939), $p = .007$.

For sexually inactive participants, there was a main effect for message visual appeal, $F(1,172) = 4.2$, $P = .042$, $\eta_p^2 = .024$. Rational appeal infographics generated higher self-referencing and outcome relevance evaluation ($M = 3.70$, $SD = 1.56$) than emotional appeal infographics ($M = 3.18$, $SD = 1.60$).

In summary, sexually inactive participants perceived lower self-relevance and outcome involvement compared to sexually active participants, and the reported involvement was even lower after viewing the emotional appeal messages (compared to the rational appeal messages). On the other hand, sexually active participants reported higher self-relevance evaluation for gain-framed messages than the loss-framed messages. When rational visual appeals were used, the emotional intervention message strategy led to higher self-relevance and outcome involvement ratings than the cognitive intervention strategy.

Factors Influencing Condom Use Intention

Hierarchical multiple regressions were conducted on sexually active participants and sexually inactive participants respectively to compare factors that influence condom use intention (See Table 4).

For sexually active participants, intervention message strategy was a significant predictor of condom use intention (emotional intervention higher, $\beta=.123$, $p=.008$), as well as the ratio of affect and reason ($\beta=.14$, $p=.002$). These two predictors together with perceived severity of not using a condom ($\beta=.491$, $p <.000$), extrinsic rewards ($\beta=.125$, $p=.012$), intrinsic rewards ($\beta = .118$, $p=.016$), response costs ($\beta=-.149$, $p=.002$), and self-efficacy ($\beta=.103$, $p=.049$) explained 59.8% the variance.

For sexually inactive participants, intervention message strategy and the ratio of affect and reason were not significant. Instead, perceived severity of not using a condom ($\beta=.572$, $p <.000$), extrinsic rewards ($\beta=.147$, $p=.004$), self-efficacy ($\beta=.221$, $p<.000$) and response costs ($\beta=-.11$, $p=.027$) explained 69.5% of the variance with gender emerging as a marginally significant predictor (female high, $\beta=.097$, $p=.049$).

Chapter 5

Discussion

This study revealed interesting differences in message processing and its effects on sexually active participants and sexually inactive participants. Perceived severity of not using a condom and condom use intention were significantly different for sexually active and inactive participants.

Results demonstrate that compared to sexually active participants, sexually inactive participants reported lower self-referencing and outcome involvement evaluations, but higher perceived severity of not using a condom as well as condom use intentions. On the other hand, sexually active participants reported higher self-referencing and outcome involvement evaluations, but lower perceived severity of not using a condom and condom use intentions, compared to the sexually inactive participants. However, it is important to note that condom use intention for sexually active participants might lead more to real behaviors. For sexually inactive participants, indicating more likelihood to use a condom does not interrupt any current behavioral choices. Therefore, it is not surprising to find that sexually inactive participants reported both low self-referencing evaluations and high condom use intentions.

Although the self-referencing and outcome involvement evaluations were just as predicted for the sexually active and inactive participants, effects of visual appeals did not follow the predictions from the dual-process models (Cacioppo & Petty, 1984; Chaiken et al., 1989). Cognitive intervention strategy did not attract the sexually active participants who had higher self-referencing and outcome involvement evaluations, nor did the emotional intervention strategy attract the sexually inactive low involvement participants. Instead, for sexually active participants, the emotional intervention messages significantly increased the condom use

intentions, compared to the cognitive-only intervention. This finding supported the effectiveness of the emotional intervention strategy developed from Ferrer et al.'s (2011) study. Therefore, adding an explicit emotional education component may bring an immediate effect on condom use intention in addition to the long-term effects (see Ferrer et al., 2011). Moreover, emotional involvement, which indicates the spontaneous responses, positively predicted condom use intention, so that the more the infographic appeals to one's intuitions about using a condom, the more condom use intention is displayed.

Sexual experiences involve situations that are highly personal and emotional. Therefore, although sexually active participants perceived more self-relevance compared to sexually inactive participants, they did not go through a more systematic processing as personal relevance increased. Instead, the emotional intervention infographics lead to higher condom use intentions. In fact, the higher the ratio of affect and reason, the higher the intention. This finding supported the conceptualization of involvement from the developmental-interactionist theory of emotion (Buck, 1985, 1999, 2014), where involvement includes both the affective the rational cognitive processing. Therefore, when a person is sexually active, sympathizing with the anticipated emotional outcomes described in the infographics might appeal to their instincts and lead to greater condom use intention.

More interestingly, there is an interaction effect between message framing and visual appeals on condom use intentions, such that loss-framed emotional visual appeal messages are more effective than the loss-framed rational visual appeal messages. This finding echoed the previous study by Chang and Lee (2009), in which negative valence-congruent affective image improved the framing effects.

While no message strategy would fit all situations, this study offers valuable insights to design safer sex messages for those who are having active sexual experiences and inactive experiences. It is noteworthy that, while sexually active participants paid more attention to the emotional intervention messages (none significant), sexually inactive participants paid significantly more attention to the cognitive intervention messages. Also, although sexually inactive participants perceived lower self-relevance and outcome involvement, the rational visual appeal messages were seen as more self-relevant than the emotional visual appeal messages. It seems that the sexually inactive participants are more interested in the factual information, as opposed to the anticipated emotions associated with the behaviors.

For practitioners, results from this study suggested that people from different stages (sexually active or inactive) responded to different message strategies. However, influencing sexually active audience is more important for the goals of an information campaign. Therefore incorporating more emotional intervention into the cognitive intervention design will bring more promise to the effectiveness of the safer sex social message design. Moreover, there may be a delayed effect for students who are not sexually active. In the video intervention study conducted by Ferrer and her colleagues, participants in the SCE intervention group only reported more condom use than participants in the SC intervention and the control groups at six months' post-intervention (Ferrer et al., 2011). The advantage of emotional education intervention did not show up until six months after the intervention message suggests that sexually inactive participants may be influenced differently. They may be influenced in ways not measurable until the emotions become relevance to them personally.

Also, diversifying message appeals is another important implication from this study. It is found that pairing the emotional visual appeal with the cognitive intervention strategy or the

rational visual appeal with the emotional intervention strategy can yield the best effect on perceived severity of not using a condom. Therefore, diversifying the types of information is more effective than using only one type of information. Emotional appeals might work the best when there is a strong rationale, and pure rational information may also be hard to process without any emotional information.

Limitations

Not measuring the relationship status is one of the major limitations of the current study. People who are in long-term relationships might choose not to use a condom as long as the relationship is exclusive. Therefore, relationship status might influence condom use intention in addition to sexually active status.

Moreover, visual literacy and numeracy are both interesting factors that might also influence infographics processing. Although visual literacy is only loosely defined (Avgerinou & Pettersson, 2011), scholars generally agree that it related to people's abilities to interpret and create visual content (e.g., Avgerinou & Pettersson, 2011; Brumberger, 2011; Spalter & van Dam, 2008). Therefore, individuals' abilities to make meaning of visual information will influence their preferences for information types as well as information processing.

Numeracy is another distinct concept that might influence people's information processing. It represents people's ability to understand numbers and mathematical rules (Peters, Hibbard, Slovic, & Dieckmann, 2007). Researchers have found that low numeracy skills lead to less accurate perceptions of health risks, therefore, predicting poorer medical decision making and health outcomes (Reyna & Brainerd, 2008). Moreover, lower numeracy also leads to lower

trust level of numerical information (Gurmankin, Baron, & Armstrong, 2004), more vulnerability to framing effects (Peters, Vastfjall, et al., 2006), and more attention to nonnumerical information such as mood states (Peters, Vastfjall, et al., 2006). Although college students, in general, had trained with at least basic mathematics before, the individual differences of numeracy might also influence infographics processing. Therefore, the current study will benefit from measuring and controlling both visual literacy and numeracy.

Lastly, using second person perspective might create potential message resistance for participants who were sexually active. While sexually active participants are considered more emotionally involved, they did not report higher negative prosocial emotions (e.g., shame and guilt) as predicted after viewing the loss-framed emotional intervention messages. However, sexually active participants did report higher self-relevance evaluations after viewing the gain-framed emotional intervention messages where positive emotions such as loving and caring are emphasized. On the one hand, social desirability bias might play a role, as participants are less likely to report feeling guilt or shame for not using a condom. On the other hand, the wordings of the infographics, “you will feel shame and guilt” as opposed to “people will feel shame and guilt” might create an uncomfortable feeling that might lead to message resistance. A third person perspective might decrease the direct link between the negative emotions and the participants and hence decreasing the message resistance.

Future Directions

This study addressed important questions to choose safer sex intervention strategies and infographics design. For sexually active participants who are emotionally involved with condom

use, the emotional education intervention has proved more effective than the cognitive intervention strategies. Future research may continue to explore the effectiveness of emotional intervention strategies focusing on other anticipatory emotions such as trust, worry, and regret. It would also be meaningful to apply the emotional intervention strategies in other health intervention contexts such as smoking cessation and weight loss.

For infographic design, it would also be interesting to study the interaction effects on numeracy and the complexity of the infographic design. Based on the limited capacity model (Lang, 2000; 2006), when the complexity of an infographic exceeds the mental process limits, attention, memory and other processing stages can be affected. For people with lower numeracy, emotional photos might draw more attention and bring more mental responses than any statistical graphics and charts. Therefore, it is important to find the balance point for how much and what type of information to include in one infographic.

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Table 1. Factor Loading for EFA of SAFECOMM Items.

Factor Loadings for Exploratory Factor Analysis with Varimax Rotation of SAFECOMM Items: Emotion Structure of Viewing the Infographic.

Emotion	Positive Individualistic	Negative Individualistic	Positive Prosocial	Negative Prosocial	Reptilian
$\alpha = .79$					
Satisfied	.58				
Confident	.86				
Secure	.86				
$\alpha = .85$					
Angry		.78			
Hostile		.81			
Hateful		.80			
$\alpha = .90$					
Loving/loved			.80		
Caring			.82		
Nurturing			.84		
$\alpha = .83$					
Afraid				.66	
Ashamed				.79	
Embarrassed				.79	
Isolated		.51		(.49)	
Lonely				.56	
Sad				.74	
$\alpha = .84$					
Vigorous		.58			.50
Energetic		(.47)			.54
Erotic					.82
Aroused					.84

Note: Factor loading above .50 are shown. Factor loading between .45 and .49 in parentheses.

Table 2 Mean Comparisons between Sexually Active and Inactive Participants

Conditions	Sexually Active		Sexually Inactive		t	Sig. (2-tailed)
	Mean	N	Mean	N		
EEG	4.61 (SD=1.27)	31	5.26 (SD=1.78)	25	1.55	P = .115
EEL	5.05 (SD=1.89)	33	5.78 (SD=1.13)	28	1.77	P = .071
ERG	4.99 (SD=1.65)	33	5.96 (SD=1.00)	28	2.70	P = .007*
ERL	4.86 (SD=1.65)	35	5.60 (SD=1.58)	22	1.67	P = .105
CEG	4.61 (SD=1.51)	34	5.65 (SD=1.16)	20	2.82	P = .011*
CEL	4.87 (SD=1.54)	33	5.73 (SD=1.37)	22	2.16	P = .040*
CRG	4.59 (SD=1.78)	37	5.71 (SD=1.05)	21	2.62	P = .004*
CRL	3.69 (SD=1.62)	36	6.08 (SD=.90)	19	5.97	P < .000*
Total	4.65 (SD=1.67	272	5.72 (SD=1.28)	185	7.38	P < .000*

- E (C) EG: Emotional (Cognitive) intervention –Emotional Appeal-Gain
- E (C) EL: Emotional (Cognitive) Intervention-Emotional Appeal-Loss
- E (C) RG: Emotional (Cognitive) Intervention-Rational Appeal-Gain
- E (C) RL: Emotional (Cognitive) Intervention-Rational Appeal-Loss

Table 3. MANOVA Results for the Effects of Message Frame and Sexually Active Status on Emotional Responses.

Variable	Wilks' Λ	F	df	Error df	Partial η^2
Message Frame	.911	8.88***	5	451	.090
Sexually active status	.974	2.37*	5	451	.026
Frame X Status	.982	1.62	5	451	.018
* p< .05 *** p<.001					

Table 4. Multiple regression predicting **condom use intention**

	Sexually Active		Sexually Inactive	
Predictors	β	ΔR^2	β	ΔR^2
Block1: Demographics		.012		.066**
Gender (female high)	-.134**		.097*	
Age	-.055		-.013	
Block 2: Experimental Conditions		.059*		.050
Message framing (LG)	.015		-.066	
Visual Appeal (AE)	-.042		-.049	
Intervention Strategies (CE)	.123**		-.047	
LGXAE	-.041		-.032	
LGXCE	-.081		.041	
AEXCE	-.005		.057	
AEXCEXLG	.027		.050	
Block3: Information Processing factors		.178***		.156***
Affect/ Reason Ratio	.14**		.004	
Self-referencing	.036		-.080	
Attention	.093		.071	
Positive individualistic	-.044		-.086	
Negative individualistic	-.012		-.023	
Positive prosocial	.031		.068	
Negative prosocial	.011		-.017	
Reptilian	.112		.106	
Argument quality	-.001		.026	
Block4: Risk-related Belief		.347***		.465***
Perceived severity of not using a condom	.491***		.572***	
Extrinsic rewards	.125*		.147**	
Intrinsic Rewards	-.118*		-.033	
Self-efficacy	.103*		.221***	
Response Costs	-.149**		-.11*	

* $P < .05$

** $P < .01$

*** $P < .001$

Figure 1. Mean Comparisons between Sexually Active and Inactive Participants

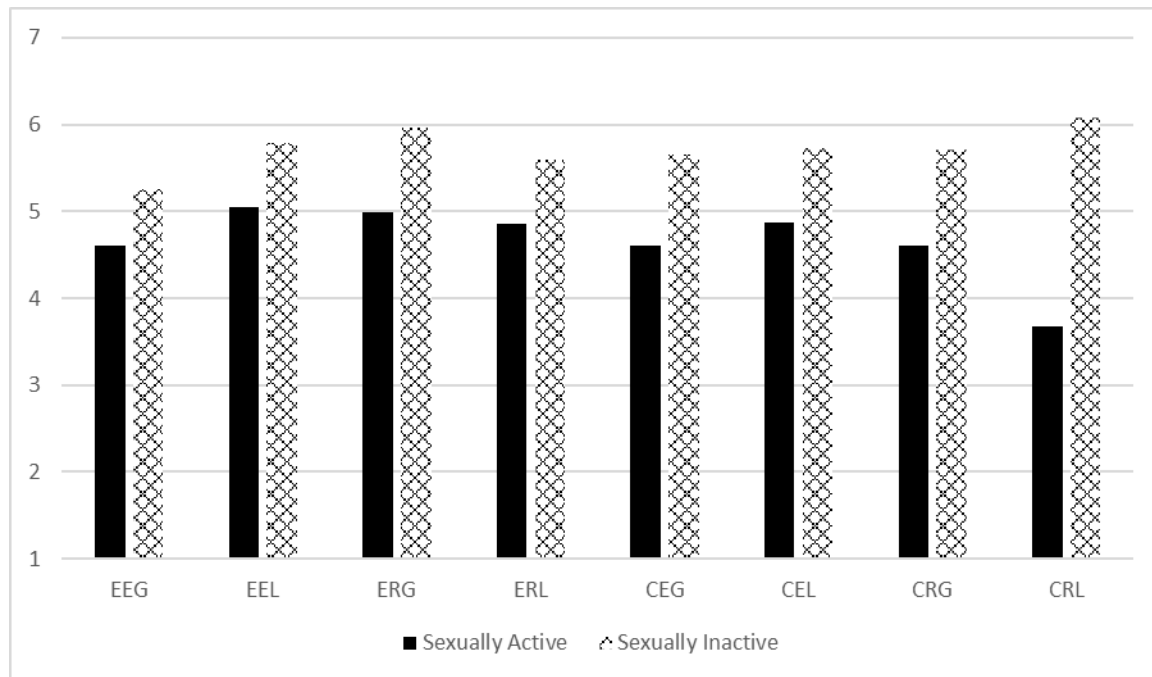


Figure 2.Means of Intention to Use a Condom from Different Intervention Strategies

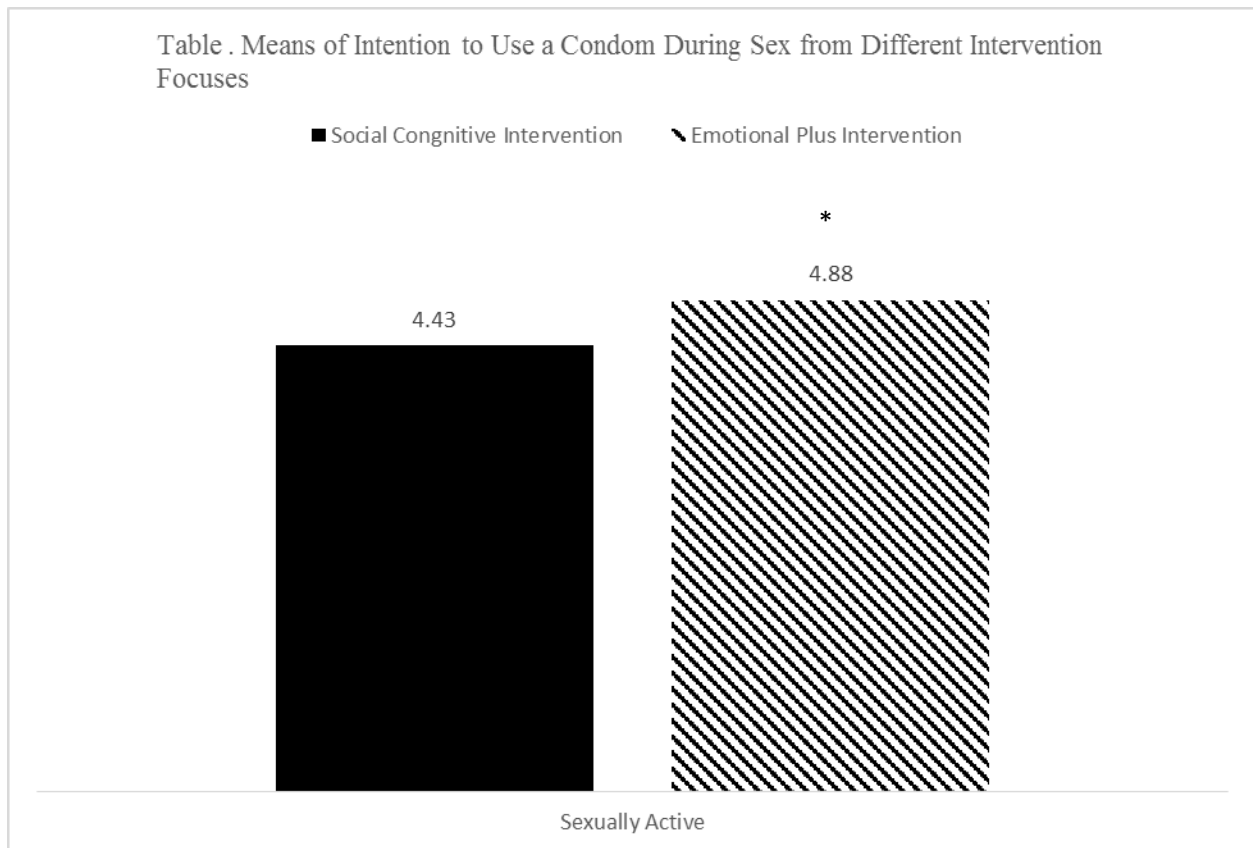


Figure 3. Interaction Effect between Message Framing and Visual Appeals among Sexually Active Students

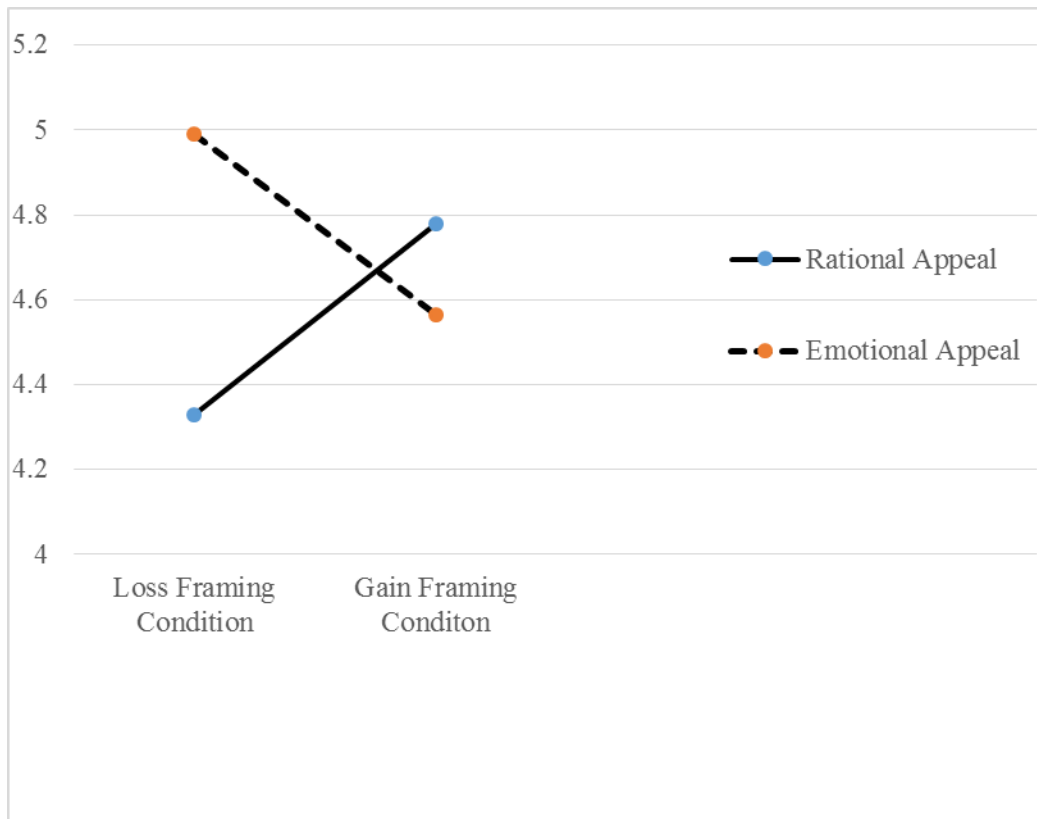


Figure 4. Interaction Effects between Intervention Strategies and Message Visual Appeals on Perceived Severity of Not Using a Condom among Sexually Active College Students

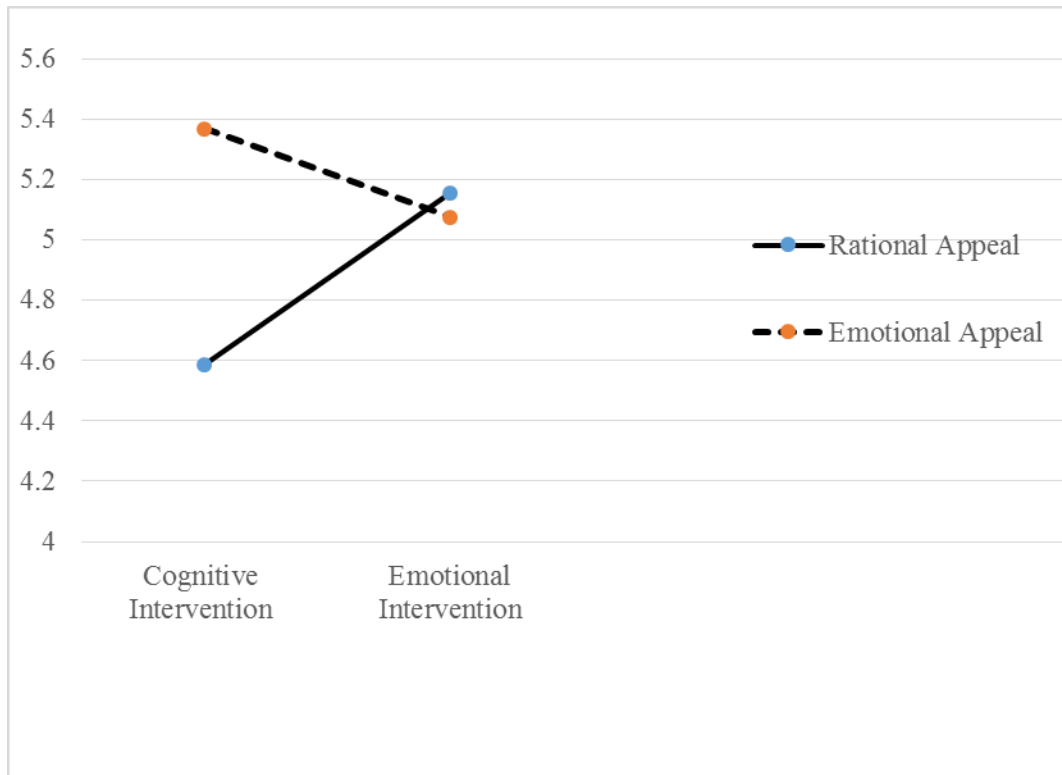


Figure 5. Interaction Effects between Intervention Strategies and Sexually Active Status on Attention

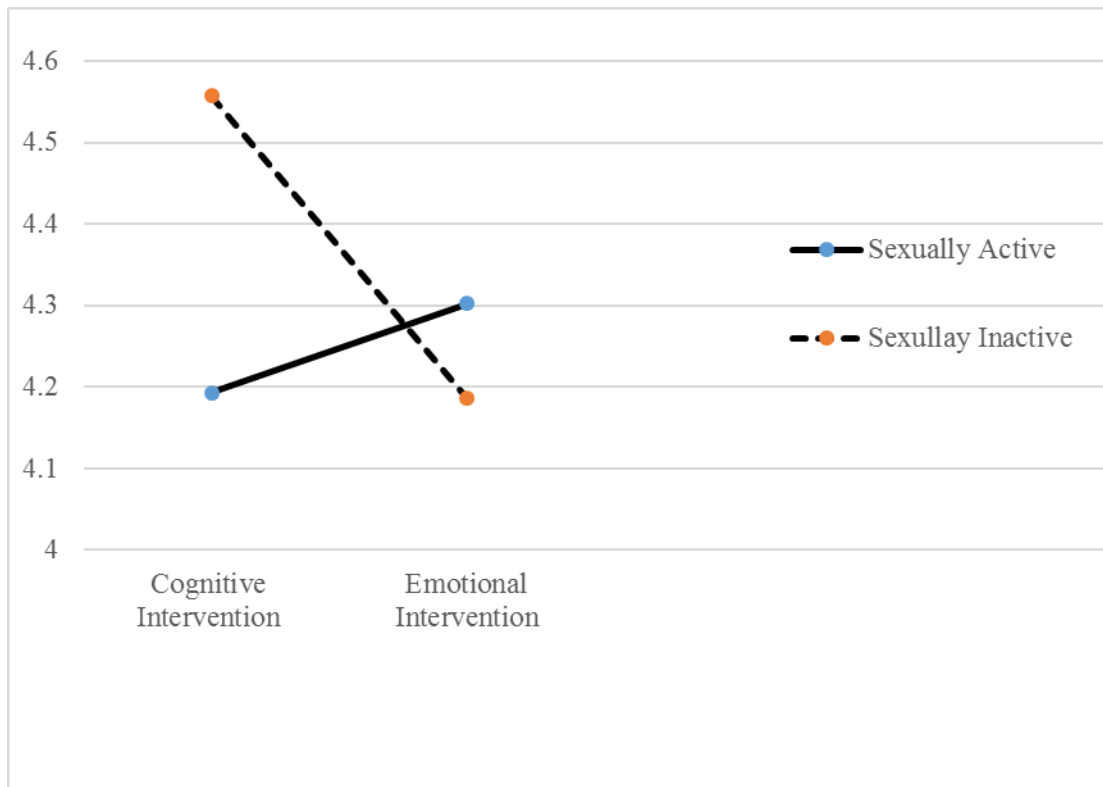


Figure 6.Means of Negative Prosocial Emotion from Sexually Active and Inactive Participants.

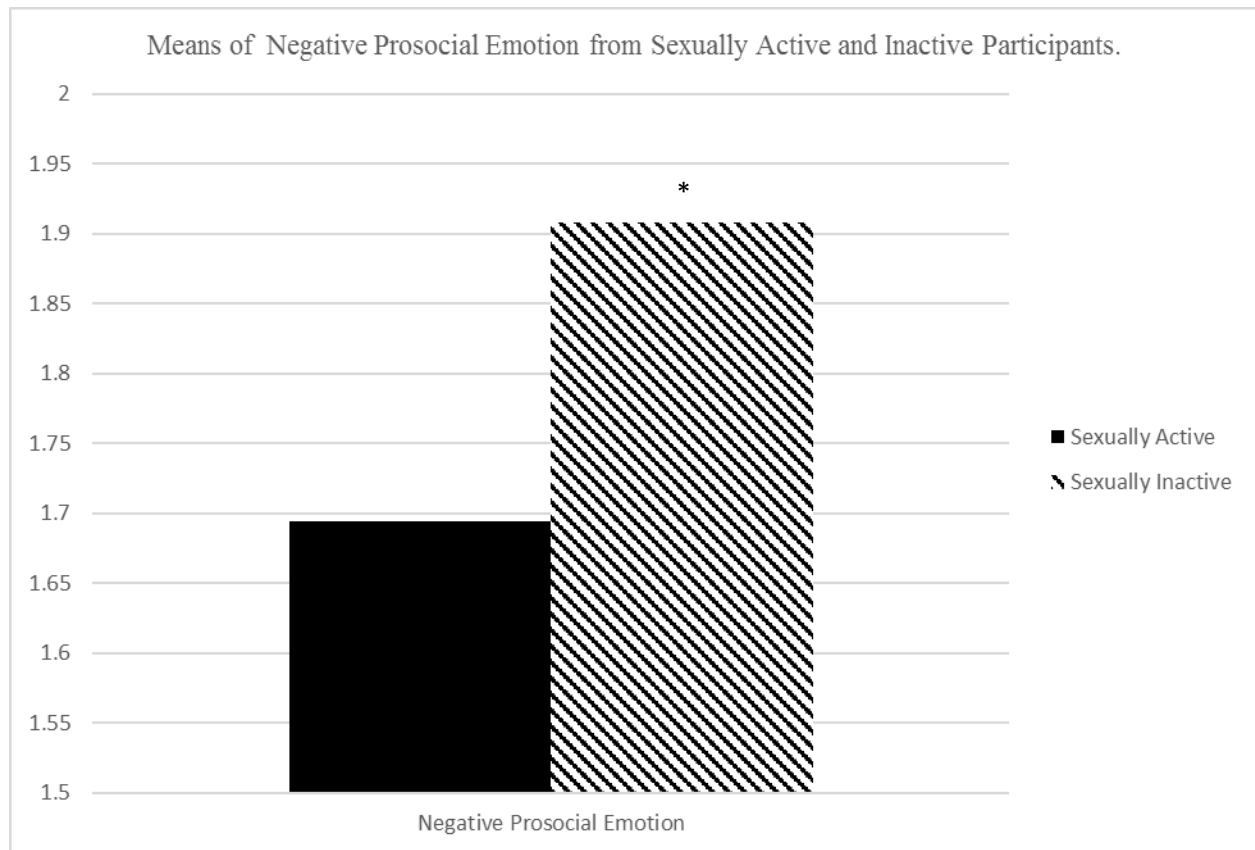
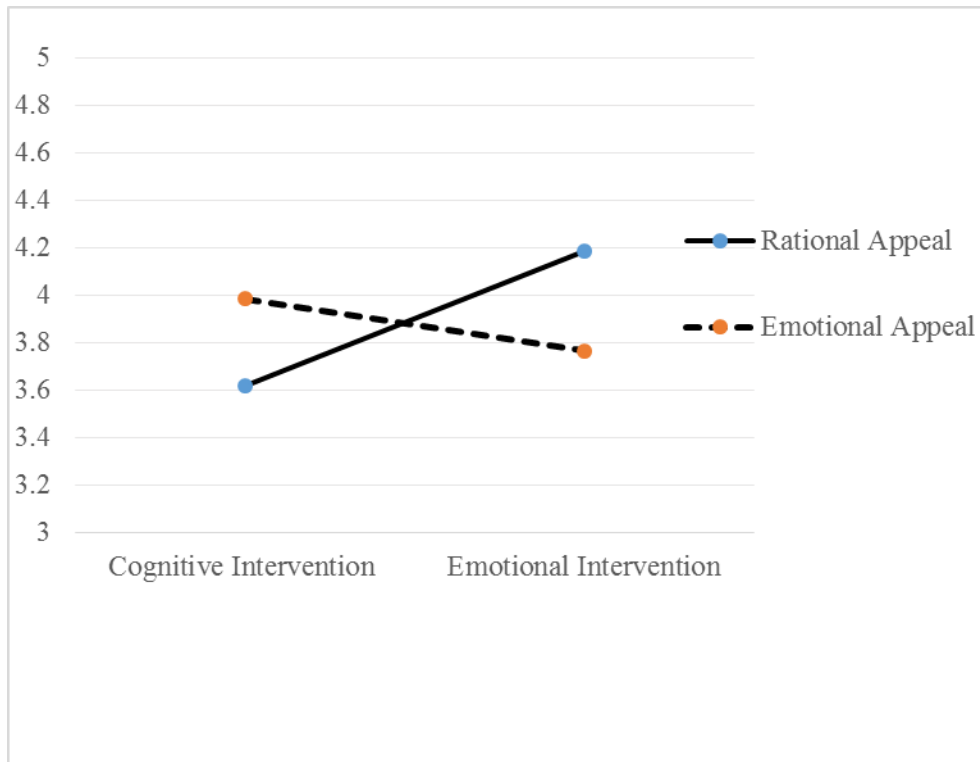


Figure 7. Interaction Effects between Intervention Strategies and Visual Appeal on Self-referencing and Outcome Involvement among Sexually Active College Students.



Appendix A. Information Sheet

Information Sheet for Participation in an Online Survey



Principal Investigator: Ross Buck

Student: Yi Wang

Title of Study: Designing and Sharing Safe Sex Infographics

You are invited to participate in this study of safe sex infographics. The purpose of this research is to gather information on college students' responses and preferences on safe sex infographics.

Your participation in this study will require completion of the attached questionnaire and viewing of one infographic. This should take approximately 30 minutes. Your participation will be anonymous, and you will not be contacted again in the future. If you are a member of University of Connecticut's Communication 1000 course taking the survey for course credit, then you will receive ten credit points for 30 minutes of participation. This survey does not involve any risk to you. However, your participation may impact society by helping to increase our knowledge about safe sex message effectiveness.

You do not have to be in this study if you do not want to be. You do not have to answer any question that you do not want to answer for any reason. We will be happy to answer any questions you have about this study. If you have further questions about this project or if you have a research-related problem, you may contact me, Yi Wang at yi.2.wang@uconn.edu, or my advisor, Ross Buck at ross.buck@uconn.edu. If you have any questions about your rights as a research participant, you may contact the University of Connecticut Institutional Review Board (IRB) at 860-486-8802. The IRB is a group of people who review research studies to protect the rights and welfare of research participants.

After completing the study, you will be directed to a separate, secure webpage where you will have the opportunity to enter your personal information to obtain course credit. Your personal information will not be linked in any way to your study responses.

Please click on the "I Agree to Participate" link below to indicate your willingness to participate in and access the survey questionnaire.

I Agree to Participate:

Thank you for your participation.

Appendix B. Infographics

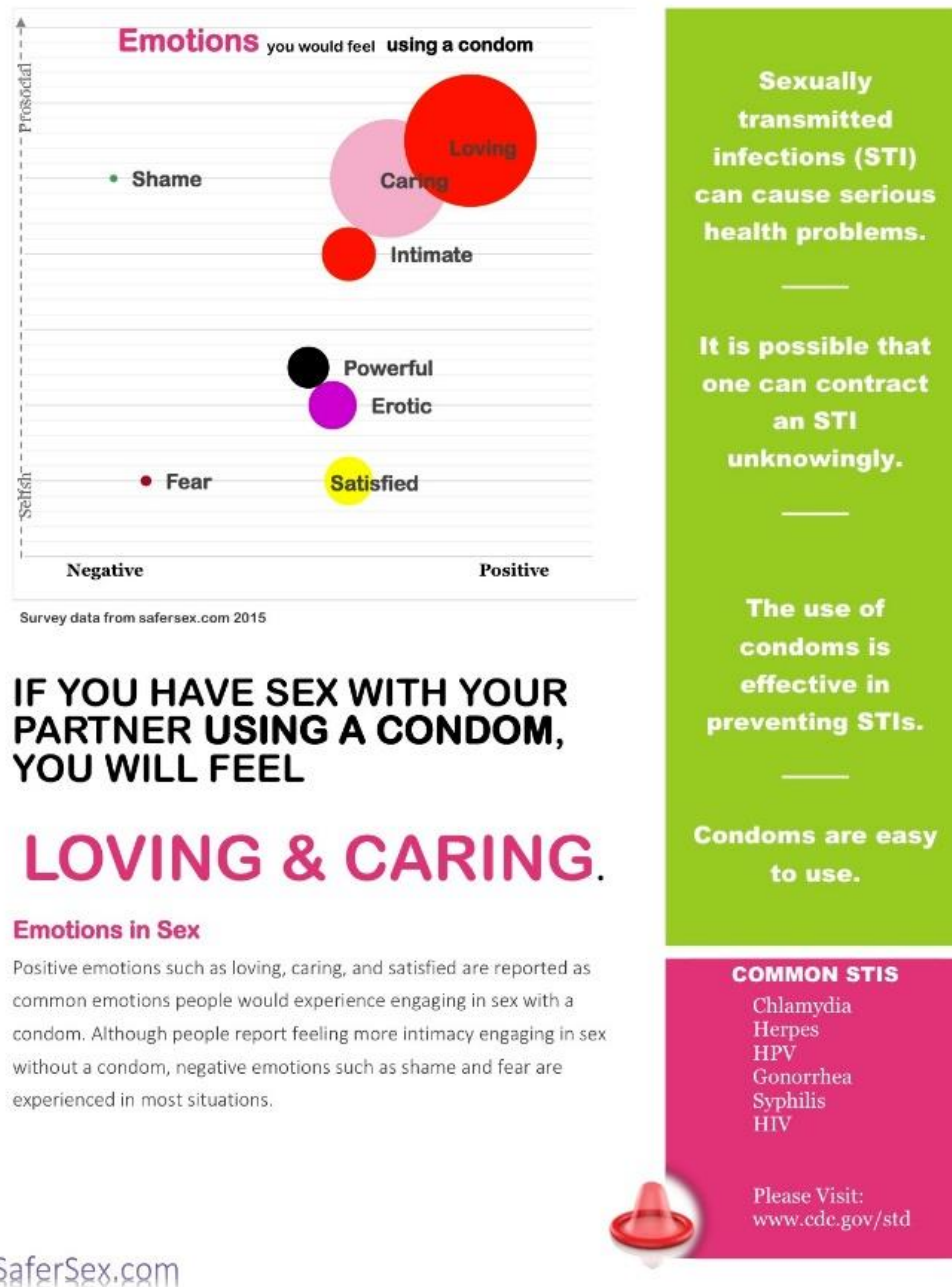
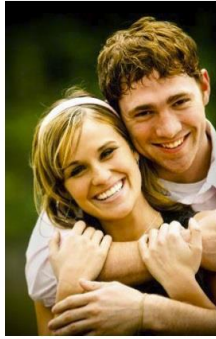


Figure 8 Gain-Data-Emotional Infographic



Figure 9 Loss-Data-Emotional Infographic



Loving and Caring are experienced the most when a condom is used during sex.

IF YOU HAVE SEX WITH YOUR PARTNER USING A CONDOM, YOU WILL FEEL

LOVING & CARING.

Emotions in Sex

Positive emotions such as loving, caring, and satisfied are reported as common emotions people would experience engaging in sex with a condom. Although people report feeling more intimacy engaging in sex without a condom, negative emotions such as shame and fear are experienced in most situations.

SaferSex.com

Sexually transmitted infections (STI) can cause serious health problems.

It is possible that one can contract an STI unknowingly.

The use of condoms is effective in preventing STIs.

Condoms are easy to use.

COMMON STIS

Chlamydia
Herpes
HPV
Gonorrhea
Syphilis
HIV

Please Visit:
www.cdc.gov/std



Figure 10 Gain-Photo-Emotional Infographic



Shame and fear are experienced the most when a condom is not used during sex.



IF YOU HAVE SEX WITH YOUR PARTNER WITHOUT USING A CONDOM, YOU WILL FEEL

SHAME & FEAR.

Emotions in Sex

Although people report feeling more intimacy engaging in sex without a condom, negative emotions such as shame and fear are experienced in most situations. On the other hand, positive emotions such as loving, caring, and satisfied are reported as common emotions people would experience engaging in sex with a condom.

SafeSex.com

Sexually transmitted infections (STI) can cause serious health problems.

It is possible that one can contract an STI unknowingly.

The use of condoms is effective in preventing STIs.

Condoms are easy to use.

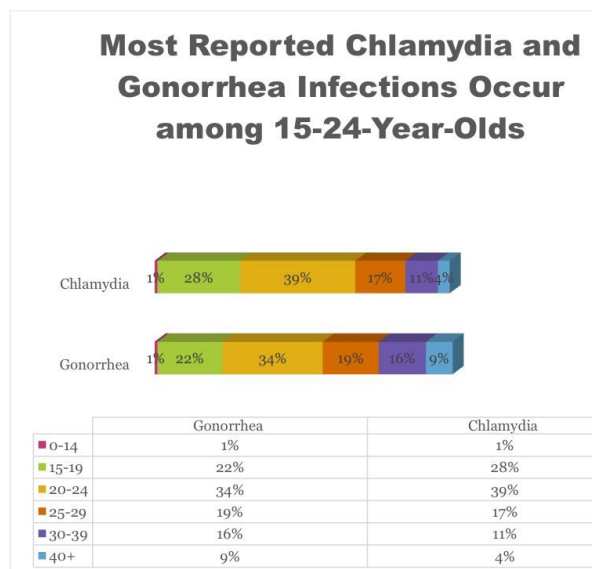
COMMON STIS

Chlamydia
Herpes
HPV
Gonorrhea
Syphilis
HIV

Please Visit:
www.cdc.gov/std



Figure 11 Loss-Photo-Emotional Infographic



**IF YOU HAVE SEX WITH YOUR PARTNER
USING A CONDOM, THE USE OF
CONDOMS IS EFFECTIVE IN
PREVENTING STI.**

STIS AND SEX

Centers for Disease Control and Prevention (CDC) estimates that nearly 20 million new sexually transmitted infections occur every year in this country, half among young people ages 15–24. Each of these infections is a potential threat to an individual's immediate and long-term health and well-being. In addition to increasing a person's risk for acquiring and transmitting HIV infection, STDs can lead to severe reproductive health complications, such as infertility and ectopic pregnancy.

SaferSex.com



**Sexually
transmitted
infections (STI)
can cause
serious health
problems.**

**It is possible that
one can contract
an STI
unknowingly.**

**The use of
condoms is
effective in
preventing STIs.**

**Condoms are
easy to use.**

COMMON STIS

Chlamydia
Herpes
HPV
Gonorrhea
Syphilis
HIV

Please Visit:
www.cdc.gov/std

Figure 12 Gain-Data-Cognitive Infographic

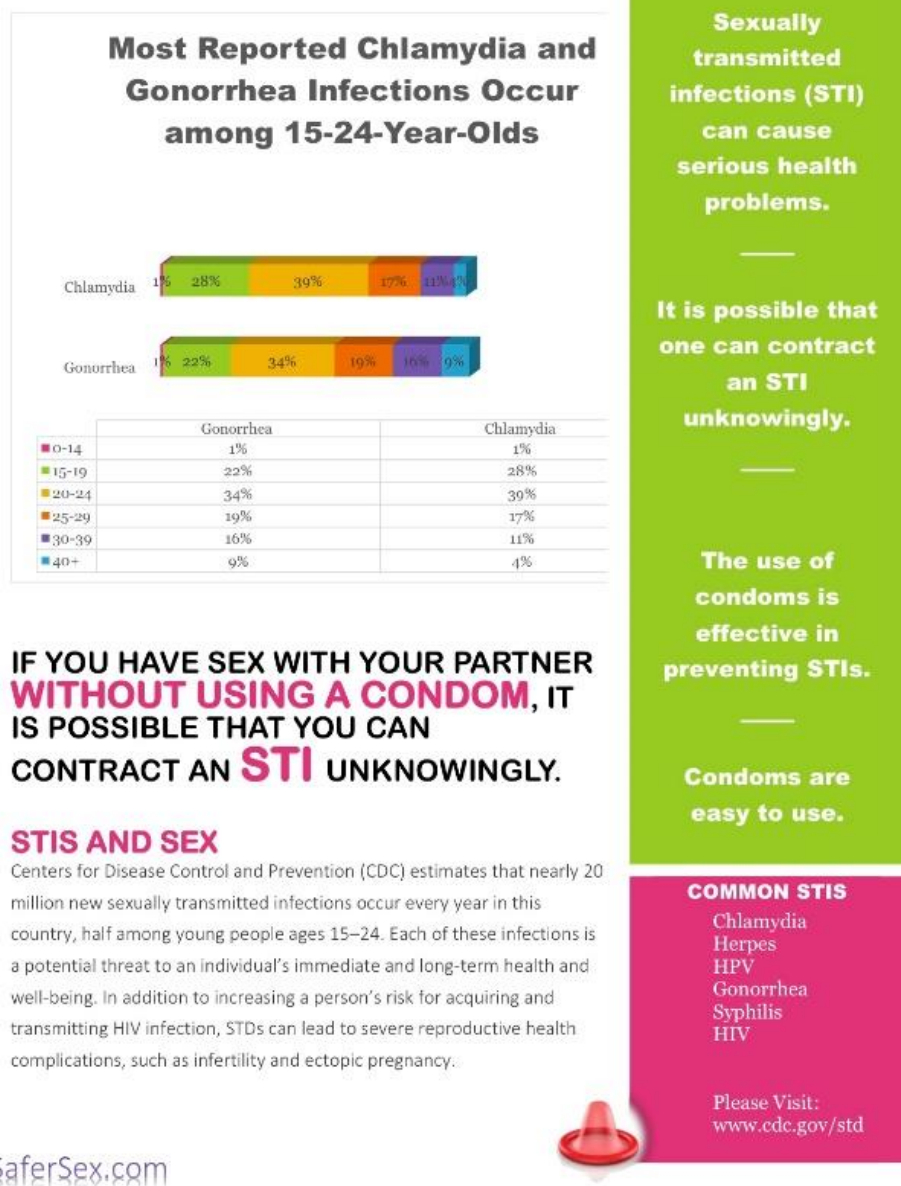
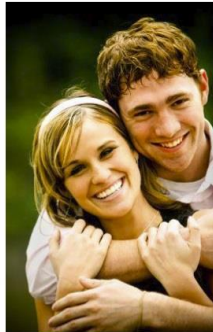


Figure 13 Loss-Data-Cognitive Infographic



**IF YOU HAVE SEX WITH YOUR PARTNER
USING A CONDOM, THE USE OF
CONDOMS IS EFFECTIVE IN
PREVENTING STI.**

STIS AND SEX

Centers for Disease Control and Prevention (CDC) estimates that nearly 20 million new sexually transmitted infections occur every year in this country, half among young people ages 15–24. Each of these infections is a potential threat to an individual's immediate and long-term health and well-being. In addition to increasing a person's risk for acquiring and transmitting HIV infection, STDs can lead to severe reproductive health complications, such as infertility and ectopic pregnancy.

SaferSex.com

**Sexually
transmitted
infections (STI)
can cause serious
health problems.**

**It is possible that
one can contract
an STI
unknowingly.**

**The use of
condoms is
effective in
preventing STIs.**

**Condoms are easy
to use.**

COMMON STIS

Chlamydia
Herpes
HPV
Gonorrhea
Syphilis
HIV



Please Visit:
www.cdc.gov/std

Figure 14 Gain-Photo-Cognitive Infographic



IF YOU HAVE SEX WITH YOUR PARTNER
WITHOUT USING A CONDOM, IT
IS POSSIBLE THAT YOU CAN
CONTRACT AN **STI** UNKNOWNLY.

STIS AND SEX

Centers for Disease Control and Prevention (CDC) estimates that nearly 20 million new sexually transmitted infections occur every year in this country, half among young people ages 15–24. Each of these infections is a potential threat to an individual's immediate and long-term health and well-being. In addition to increasing a person's risk for acquiring and transmitting HIV infection, STDs can lead to severe reproductive health complications, such as infertility and ectopic pregnancy.

SafeSex.com

**Sexually
transmitted
infections (STI)
can cause serious
health problems.**

**It is possible that
one can contract
an STI
unknowingly.**

**The use of
condoms is
effective in
preventing STIs.**

**Condoms are easy
to use.**

COMMON STIS

Chlamydia
Herpes
HPV
Gonorrhea
Syphilis
HIV



Please Visit:
www.cdc.gov/std

Figure 15 Loss-Photo-Cognitive Infographic

MANIPULATION CHECK

Please evaluate the visual image on the infographic that you have just reviewed.

M1. The visual image of the infographic is _____

Rational						Emotional
1					7	
Analytical						Intuitive
1	2	3	4	5	6	7
Logical						Affective
1					7	

M2. The tone of the infographic of using a condom (or not using a condom) is _____

Negative		Positive
1	7	

M3. Does the infographic emphasize the benefits associated with using a condom or the costs of not using a condom?

Cost		Benefit
1	7	

M4. Does the infographic emphasize the gains associated with using a condom or the losses of not using a condom?

Loss		Gain
1	7	

Demographic Characteristics

D1. How old were you on your last birthday? ____ Years old

D2. What is your gender?

- 1) Male
- 2) Female

D3. What is your ethnicity and Racial Categories?

- 1) American Indian/ Alaskan
- 2) Asian
- 3) Black or African American
- 4) Hispanic or Latino
- 5) Native Hawaiian or other Pacific Islander
- 6) White
- 7) Other

D4. What year are you at UConn?

- (1) Freshman
- (2) Sophomore
- (3) Junior
- (4) Senior
- (5) Graduate Student

Sexual Behavior

SD1. Have you been sexually active in the past month?

___ Yes (1) ___ No (0)

SD2. Have you bought/obtained condoms in the past month?

___ Yes (1) ___ No (0)

SD3. Have you talked to a partner about using condoms before?

___ Yes (1) ___ No (0)

SD4. How often have you used a latex condom when you had sexual intercourse?

- 1) Never
- 2) Rarely
- 3) Sometimes
- 4) Less than half of the time
- 5) At least half of the time
- 6) Most of the time
- 7) Always

This is an infographic appears in your social media news fed.

Show the infographic

Em1. Please indicate the level of each emotion that you felt when viewed the infographic.

	Not at all					Very much	
Loving/ Loved	1	2	3	4	5	6	7
Caring	1	2	3	4	5	6	7
Nurturing	1	2	3	4	5	6	7
Afraid	1	2	3	4	5	6	7
Ashamed	1	2	3	4	5	6	7
Embarrassed	1	2	3	4	5	6	7
Satisfied	1	2	3	4	5	6	7
Confident	1	2	3	4	5	6	7
Secure	1	2	3	4	5	6	7
Angry	1	2	3	4	5	6	7
Hostile	1	2	3	4	5	6	7
Hateful	1	2	3	4	5	6	7
Isolated	1	2	3	4	5	6	7
Lonely	1	2	3	4	5	6	7
Sad	1	2	3	4	5	6	7
Vigorous	1	2	3	4	5	6	7
Energetic	1	2	3	4	5	6	7
Powerful	1	2	3	4	5	6	7
Erotic	1	2	3	4	5	6	7
Aroused	1	2	3	4	5	6	7

Analytical Processing

A1. How much do you THINK logically while viewing the infographic?

Not at all
1 2 3 4 5 6 7 Very much

A2. How much do you ANALYZE the pros and cons of using or not using a condom while viewing the infographic?

Not at all
1 2 3 4 5 6 7 Very much

A3. How much do you REASON about the facts associated with using or not using a condom while viewing the infographic?

Not at all
1 2 3 4 5 6 7 Very much

Emotional Processing

EP1. How strongly do you FEEL while viewing the infographic?

Not at all
1 2 3 4 5 6 Very much
7

EP2. How much does this infographic appeal to your intuitions about using or not using a condom?

Not at all
1 2 3 4 5 6 Very much
7

EP3. How much does this infographic appeal to your INSTINCTS about using or not using a condom?

Not at all
1 2 3 4 5 6 Very much
7

Message Evaluation.

Please use 1-7 to indicate how much you agree with the following statements describing the infographic you just viewed. (1=strongly disagree, 7=strongly agree)

ME1. This infographic makes me feel very emotional.

ME2. This infographic involves plenty of analytical information regarding condom use.

ME3. I found this infographic to be novel.

ME4. I found this infographic to be informative.

ME5. I found this infographic to be useful.

ME6. I found this infographic to be interesting.

ME7. I found this infographic to be important.

ME8. I found this infographic to be well supported with evidence.

ME9. I like this infographic.

ME10. I have learned a lot from this infographic.

ME11. I found this infographic to be persuasive.

Message Processing Scales

Attention

	Strongly disagree					Strongly agree		
ATT1. I paid close attention to the infographic while watching it.	-3	-2	-1	0	1	2	3	
ATT2. During viewing, I didn't let myself get distracted from focusing on the message content.	-3	-2	-1	0	1	2	3	
ATT3. I found my mind wandering while viewing the infographic (reversed).	-3	-2	-1	0	1	2	3	

ATT4. I was mentally involved in the infographic while watching it.	-3	-2	-1	0	1	2	3
ATT5. After viewing the infographic, I found it easy to put it out of my mind (reversed).	-3	-2	-1	0	1	2	3

Self-referencing and outcome-relevant involvement

	Not at all				Very much		
RR1. How much did this infographic make you think about yourself?	1	2	3	4	5	6	7
RR2. How much did this infographic make you think about your own risk for having sex without a condom?	1	2	3	4	5	6	7
RR3. To what extent did you think the infographic was related to you personally?	1	2	3	4	5	6	7
RR4. To what extent did you think the infographic would affect you personally?	1	2	3	4	5	6	7
RR5. To what extent were you reminded of your own potential sexual encounters while viewing the infographic?	1	2	3	4	5	6	7

Perceived Severity-Condom Use.

Please indicate how strongly you agree or disagree with each of the following statements.

	Strongly disagree				Strongly agree		
PSC1. I will be concerned if a condom is not used during sexual intercourse.	-3	-2	-1	0	1	2	3
PSC2. I think that not using a condom during sexual intercourse is dangerous.	-3	-2	-1	0	1	2	3
PSC3. I believe that not using a condom during sexual intercourse can lead to serious health problems.	-3	-2	-1	0	1	2	3

Extrinsic Rewards

ER1. How often do you think your peers use a condom with stable sexual partners?

Never	Rarely	Sometimes	Less than Half	At least	Most of	
			of the time	Half of the time	the time	Always
1	2	3	4	5	6	7

ER2. How often do you think your peers use a condom with casual sexual partners?

Never	Rarely	Sometimes	Less than Half	At least	Most of	
			of the time	Half of the time	the time	Always
1	2	3	4	5	6	7

ER3. How many of your peers think that they should use a condom consistently?

Almost none of them (1)

Only a few of them (2)

Around half of them (3)

More than half of them (4)

Almost all of them (5)

Intrinsic Rewards.

	Strongly disagree							Strongly agree
IR1. I feel better without using a condom when having sexual intercourse.	-3	-2	-1	0	1	2	3	
IR2. I feel closer to a sexual partner without using a condom.	-3	-2	-1	0	1	2	3	
IR3. I feel safe using a condom when having sex intercourse. (Reverse Coded)	-3	-2	-1	0	1	2	3	

Response Efficacy.

	Strongly disagree						Strongly agree
RE1. The use of condoms ensures that I am protected against STIs.	-3	-2	-1	0	1	2	3
RE2. The use of condoms is effective in preventing STIs.	-3	-2	-1	0	1	2	3
RE3. The use of condoms reassures me that I am safe from contracting STIs.	-3	-2	-1	0	1	2	3

Response Costs.

	Strongly disagree						Strongly agree
RC1. If I insist on using a condom, the atmosphere of having sex could be interrupted.	-3	-2	-1	0	1	2	3
RC2. If I insist on using a condom, my sexual partner's mood could be interrupted.	-3	-2	-1	0	1	2	3
RC3. Using a condom can reduce sexual pleasure.	-3	-2	-1	0	1	2	3

Self-Efficacy.

	Strongly disagree						Strongly agree
SE1. It is easy to use condoms.	-3	-2	-1	0	1	2	3
SE2. I am not afraid to use condoms.	-3	-2	-1	0	1	2	3
SE3. I am able to use condoms effectively.	-3	-2	-1	0	1	2	3
SE4. I am able to get condoms with ease.	-3	-2	-1	0	1	2	3

Protection Motivation (Intention).

	Strongly disagree				Strongly agree		
PI1. I intend to use a condom for myself or on my partner every time there is penetrative sex.	-3	-2	-1	0	1	2	3
PI2. I intend to use a condom to protect myself from getting STIs.	-3	-2	-1	0	1	2	3
PI3. I would ensure that my partner or I have a condom to use before penetrative sex.	-3	-2	-1	0	1	2	3
PI4. I intend to use a condom regardless of how my partner feels.	-3	-2	-1	0	1	2	3
PI5. I would not have sex unless a condom is used.	-3	-2	-1	0	1	2	3