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TERROR MANAGEMENT THEORY AND ANTI-TOBACCO ADVERTISING: AN EXPERIMENTAL EXAMINATION OF INFLUENCE OF DEATH EXPLICIT ANTI-TOBACCO MESSAGES ON YOUNG ADULTS

JENSEN MOORE, ESTHER THORSON AND GLENN LESHNER

Terror Management Theory (TMT) posits the primary function underlying human behavior is self-preservation. Humans are uniquely conscious that they will inevitably die, and death-related thoughts regulate their behaviors. Thoughts of death remove an individual's "protection" from mortality and make them seek ways to "save themselves" (Greenberg, Solomon, & Pyszczynski, 1997, p. 72). When faced with thoughts of their own death, human beings try to control mortality-related anxiety: promoting the beliefs and values of their culture (cultural worldview defense); showing aggression toward and suggesting punishments for those outside their social group; changing behaviors to comply with social norms; and/or overestimating the number of people who agree with their views. This study used a 2 (death explicit/non-death message) x 2 (smoker/non-smoker) between-subjects experiment wherein young adult participants were exposed to either 7 death-explicit or 7 non-death anti-tobacco ads, and completed self-report measures of anxiety, cultural worldview defense, smoking blame, behavioral intent, and perception of smoking consensus following. Findings from this study suggested that responses to death-explicit anti-tobacco ads support previous TMT findings that death-related thoughts function as a motivating force in defending cultural worldviews and overestimating social consensus for minority viewpoints.

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Health communication research has long reflected considerable interest in the use of fear appeals. Recent studies indicate that fear appeals create emotions such as anxiety, aggression, and avoidance that are highly effective in promoting socially desirable behaviors (Millar & Millar, 1996; Ohbuchi, Ohno, & Mukai, 2001; Ruiter, Verplanken, & van Eersel, 2003; Shehryar & Hunt, 2005). Fear appeals often communicate threats of disease, damage, or death. However, some studies confound the definition of a fear appeal (e.g., death) with that of a disgust appeal (e.g., gore), while others simply define a fear appeal in terms of negative affect (Sutton, 1992).

Thus, many studies fail to identify intrinsic message features necessary for fear appeals and merely suggest that fear appeals contain threats which trigger "unpleasant emotional state[s]" (Ruiter, Abraham, & Kok, 2001, p. 614), or they provide "fear arousal levels" experienced by participants when viewing messages, stating that in their manipulation one message was perceived as more fearful than another (Dziokonski & Weber, 1977; Janis & Feshbach, 1954; Ruiter, Verplanken, De Cremer, & Kok, 2004; Ventis, Higbee, & Murdock, 2001). These definitions fail to distinguish effects of fear of bodily harm or disease from fear of death in terms of influencing cognitive processing or changing social behaviors (Hendrick, Giesen, & Borden, 1975; Rogers, 1975).

The current study attempts to resolve these issues by examining the attitudinal and behavioral effects of *fear of death* in anti-tobacco advertisements. Specifically, we examine anti-tobacco ads which utilize fear of death messages versus fear of disease messages using Terror Management Theory (TMT). Terror Management posits that human beings possess basic biological motives of self-preservation and that our inherent fear of death motivates humans to maintain favorable self-images, promote the beliefs and values of one's culture, and inevitably regulate behavior in socially acceptable ways (Arndt et. al,, 2000).

To the extent that death-related thoughts can influence the self-regulatory process, reminders of our mortality should have a significant effect on the way individuals respond to death-explicit anti-tobacco ads. Findings from this study suggest that responses to death-explicit anti-tobacco ads support the previous TMT that death-related thoughts function as a motivating force in defending cultural worldviews and overestimating social consensus for minority viewpoints.

Literature Review

Terror Management Theory posits that the primary function underlying human behavior is self-preservation. Humans are uniquely conscious that they will inevitably die, and death-related thoughts regulate their behaviors. Thoughts of death remove an

individual's "protection" from mortality and make them seek ways to "save themselves" (Burke, Martens, & Faucher, 2009; Greenberg, Solomon, & Pyszczynski, 1997, p. 72). Thus, a type of *symbolic immortality* is achieved when one is able to minimize death-related anxiety by identifying with and displaying behaviors consistent with cultural and social roles and values (Arndt et. al., 2000).

The Terror Management system has been theorized to be an unconscious and ongoing defense against the fear of death as human beings are motivated by the fear of death regardless of whether or not they are currently thinking about death (Arndt et. al., 2000: Burke, Martens, & Faucher, 2009). However, when faced with conscious thoughts of death, humans alleviate the anxiety which accompanies these thoughts by defending their cultural worldview. Arndt and colleagues (2000) posited that reminders of death make it difficult for individuals to behave in ways that violate their particular worldview. Thus, in addition to increased positive reactions to similar "others" individuals often perform one of the following behaviors in order to feel "safe" from death: 1) conformity to the worldview, 2) rejection of dissimilar "others", 3) aggression against dissimilar "others", 4) performing socially acceptable behaviors, 5) increase their perception of social consensus of others who share their worldview.

The current study follows Arndt, Goldenberg, Greenberg, Pyszyczynski, and Solomon's (2000) suggestion that TMT death manipulations are effective only to the extent that individuals are prompted to consider their own mortality. We posit that negative events are likely to increase negative affect, but will not create mortality salience. Thus, while messages stressing the negative effects of smoking are likely to cause negative responses, only those messages which explicitly state that individuals die from smoking will promote mortality thoughts.

Anxiety

One of the main premises of TMT is that human beings, when confronted with thoughts of their own mortality, experience intense anxiety that must be reduced. Previous TMT findings indicate that feelings of anxiety and arousal often occur when death is made salient (Arndt et. al., 2000). These feelings result in defensiveness, aggression, and exaggeration as individuals distort their reality to alleviate vulnerability to death. Anxiety also functions to increase an individual's motivation to behave in ways consistent with one's worldview (Burke, Martens, & Faucher, 2009).

We suggest than an individual's level of anxiety should directly correspond to death-related thoughts influenced by anti-tobacco messages. In response to messages where death is made explicit individuals should experience higher levels of anxiety. Conversely, messages which mention disease or harm instead of death should prompt lower levels of anxiety. Furthermore, if smoking individuals are more likely to experience mortality-related

anxiety based on their personal behaviors then they should experience greater levels of anxiety than individuals who do not smoke. Thus, we proposed the following hypotheses:

H1a: Anxiety levels for those who view the death-explicit ads will be greater than the anxiety levels of those who view the non-death ads.

H1b: Anxiety levels of smokers will be greater than the anxiety levels of non-smokers.

Cultural Worldview Defense

According to TMT, when faced with thoughts of their own death, human beings try to control mortality-related anxiety by promoting the beliefs and values of their culture (cultural worldview defense). This serves to reduce anxiety by providing individuals with a "buffer" as well as a motivation to behave in a way that is consistent with that worldview, therefore, by meeting certain worldviews, individuals can symbolically escape death (Arndt et. al., 2000).

Furthermore, individuals must show that they subscribe to the cultural worldview by advocating their particular worldview and by exhibiting defensive reactions to dissimilar "others" who do not share their worldview (Burke, Martens, & Faucher, 2009). These dissimilar "others" are often seen as moral transgressors who threaten cultural standards and values. When facing thoughts of death those within a social group often experience hostility and disdain for those not in the social group (Arndt et. al, 2000).

A series of studies by Greenberg and colleagues (1990) showed that evaluations of dissimilar "others" are more negative when death is made salient. Specifically, Christian subjects rated Christian targets more positively and Jewish targets more negatively when mortality was made salient; high authoritarians were more likely to reject individuals holding differing attitudes and beliefs when death was made salient; and mortality salience made individuals react more positively to similar "others" and more negatively to dissimilar "others."

In addition, past TMT studies have shown that mortality salience leads individuals to indicate higher levels of moral transgression and suggest stronger punishments for those who perform behaviors that do not comply with social norms (Arndt et. al. 2000). Experiments conducted by McGregor and colleagues (1998) found that individuals are also physically aggressive toward dissimilar "others." However, when given the choice between derogation, punishment, and aggression, individuals have been shown to significantly choose derogation (i.e. expressing negative attitudes about the other) (McGregor et. al., 1998).

These effects are dependent upon personal fear of death and pre-existing worldviews (Burke, Martens, & Faucher, 2009). In a series of six experiments, Rosenblatt and colleagues (1989) found that, when prompted to think of their own mortality, individuals

react more negatively to "others" who do not share their current cultural worldview. Likewise, two experiments by Florian and Mikulincer (1997) indicated that when social transgressions were directly relevant to an individual's own fear of death, he/she was more likely to rate the transgression as more severe.

Participant levels of cultural worldview defense should directly correspond to death-related thoughts influenced by anti-tobacco messages. In response to messages where death is made explicit, individuals should protect worldviews by expressing hostility and/or disdain for individuals not in their group. Conversely, for messages which mention disease or harm instead of death, individuals should experience lower of hostility/disdain. In keeping with TMT findings, it is important to note that smokers – who may not believe smoking is a wrong – are less likely than non-smokers to rate smoking or smoking behaviors as a threat/transgression. As noted by Florian and Mikulincer (1997), the belief that something is wrong must be present before the death manipulation in order for the manipulation to enhance it. In this study, it was assumed that individuals who smoke are considerably more vulnerable to tobacco-related mortality and should be more likely to identify with their own group than individuals who do not smoke. Thus, we proposed the following hypotheses:

> H2a: Cultural worldview defense for those who view the death-explicit ads will be greater than cultural worldview defense of those who view the non-death ads.
>
> H2b: Cultural worldview defense levels of smokers will be greater than the cultural worldview defense levels of non-smokers.

Smoking Responsibility

In addition to punishments, past TMT studies also suggest that mortality salience increases the attribution of responsibility for transgressions (Burke, Martens, & Faucher, 2009; Greenberg, Solomon, & Pyszczynski, 1997). For example, when death is made salient individuals should blame advertisers, smokers, and the tobacco companies more for smoking problems. In this study, smoking responsibility is conceptualized as lying with either the tobacco companies or the smoker. Participant levels of smoking responsibility should directly correspond to death-related thoughts influenced by anti-tobacco messages. In response to messages where death is made explicit, individuals should be more likely to place blame for tobacco problems and have more negative attitudes toward tobacco companies as well as smoking behaviors and smokers. Conversely, for messages which mention disease or harm instead of death, individuals should experience lower levels of blame/negative attitudes. In addition, it was suggested that individuals who smoke are considerably more likely to state that they are not at fault for smoking behaviors or have negative attitudes about their own behaviors. Thus, we proposed the following hypotheses:

H3a: Individuals who view the death-explicit ads will be more likely to allocate smoking responsibility to tobacco companies and smokers than individuals who view the non-death ads.

H3b: Non-smokers will rate smoking responsibility levels higher than smokers.

Social Consensus

Past TMT studies suggested that mortality salience influences perceptions of social consensus, therefore, those who hold minority positions on an issue will overestimate the percent of others who hold the same position (i.e., false consensus effect) (Arndt et al., 2000). In this study, cultural worldview defense was posited to lead to increased consensus for culturally relevant issues. Participant estimates of smoking (or non-smoking) should directly correspond to death-related thoughts influenced by anti-tobacco messages. In messages where death is made explicit, individuals should be more likely to overestimate the percentage of individuals who smoke. Conversely, for messages which mention disease or harm instead of death, individuals should be less likely to overestimate the percentage of individuals who smoke. In addition, since there are increasing restrictions on smoker's rights, smoking individuals may likely see themselves as the minority and will be more likely to overestimate the percentage of individuals who smoke. Thus, we proposed the following hypotheses:

H4a: Individuals who view the death-explicit ads will be more likely to overestimate the percentage of individuals who smoke versus individuals who view the non-death ads.

H4b: Smokers will be more likely to overestimate the percentage of individuals who smoke versus non-smokers.

Behavioral Intent

TMT posits that when faced with mortality salient thoughts, individuals begin to examine their own behaviors to see if they are performing according to social norms (Burke, Martens, & Faucher, 2009; Greenberg, Solomon, & Pyszczynski, 1997). This happens more often with pro-social behaviors as mortality salience increases an individual's intent to perform behaviors that will not only indicate socially desirable traits, but increase their symbolic immortality (Greenberg, Solomon, & Pyszczynski, 1997, p. 85). Thus, if faced with messages about death related to tobacco use, individuals should feel that not smoking is more socially acceptable. However, findings by Shehryar and Hunt (2005) suggested that when an individual is faced with a death message which counters their existing beliefs "message recipients will reject the advocated worldview and defend the pre-

existing worldview relevant to the context" (p. 276). That is, even if the previously accepted behavior is not socially acceptable (e.g., drinking and driving), the individual may continue to advocate the behavior as it is part of their existing worldview.

We posited that cultural worldview defense would to lead to increased intent to perform according to group norms. Participant intent to smoke in the future should directly correspond to death-related thoughts influenced by anti-tobacco messages. In messages where death is made explicit, individuals should be less likely to smoke in the future. Conversely, in response to messages which mention disease or harm instead of death, individuals should be more likely to smoke in the future as consequences for smoking are not as harsh as death.

However, it is assumed that smoking individuals are more likely to defend their own cultural worldview based on their personal behaviors. Past TMT studies have shown that even in the face of death, individuals are likely to perform the following defensive maneuvers: 1) avoid the topic, 2) redefine the situation, 3) deny their own vulnerability, 4) feel consequences are remote (Arndt et. al., 2000). This suggests that even though they are more at risk for tobacco-related deaths, individuals who smoke are considerably more likely to state that they will continue to smoke in the future. Thus, we proposed the following hypotheses:

> H5a: Individuals who view the death-explicit ads will be more likely to state they will not smoke in the future versus individuals who view the non-death ads.
>
> H5b: Smokers will be more likely to state they will smoke in the future versus non-smokers.

METHOD

An experiment was used to evaluate affective and behavioral differences that occurred following the death and non-death manipulations. A between-subjects design was used as even a subtle death manipulation has been determined to be so powerful that its effects do not easily diminish over time making a within-subjects experiment impossible (Arndt et al., 2000).

Design

A 2 (death/non-death) x 2 (smoker/non-smoker) x Message Order design was used. Smoking status was used as a moderating variable that would affect participant involvement with each type of message as well as the dependent variables of: anxiety, cultural worldview

defense, perceived transgressions, severity of punishment, behavioral intent, and social consensus.

Multiple messages were used in each level of the experimental design in order to represent multiple advertising executions, thereby minimizing the effects of individual ads. The order of each viewing was randomized in order to control for any carryover effects of prior messages. This type of counterbalancing does not remove the main effects of order, rather it distributes the effects over the levels of the stimuli so that they are not confounded, thus order becomes a control variable (Stevens, 2002). Furthermore, message effects such as multiple treatment interference, carryover, primacy, and recency were controlled through randomizing the message order.

Participants

Young adults (aged 18-24) were selected as the sample for this research as studies have shown that this age group is readily exposed to and are highly aware of pro-tobacco messages (Niederdeppe, Lindsey, Girlando, Ulasavich & Farrelly, 2003); are more likely to regularly use tobacco products as well as drugs and alcohol (Lee & Ferguson, 2002; Rigotti, 2000); and are more likely to be influenced by death and disease messages than younger groups (Niederdeppe, Lindsey, Girlando, Ulasevich, & Farrelly, 2003).

Basil, Brown, and Bocarnea (2002) suggested that this type of student sample is acceptable for an experimental study that tries to measure psychological processes. In addition, student samples have not been shown to differ from adult samples in terms of death manipulations (Burke, Martens, & Faucher, 2009; Greenberg, Solomon, & Pyszczynski, 1997). Finally, using a sample below the age of 18 would have been problematic as studies suggest that youth and teens often do not respond to death manipulations (Florian & Mikulincer, 1998).

A total of 117 participants from a large Midwest university participated in this experiment and were randomly assigned to view either death messages or non-death messages. Participants were recruited from a number of undergraduate journalism courses and were given extra credit for their participation. A total of 59 participants were randomly assigned to the death message group and 58 participants were randomly assigned to the non-death message group. Of these, 17 in the death message group were smokers and 14 in the non-death message group were smokers. A priori power estimates indicated that a total of 76 participants (19 in each condition) were necessary for a study with a large effect size (.40), a significance criterion of .05, and a power of .80. The majority of participants in each group were female, aged 20-21 and were college sophomores. The ethnic makeup of each group was decidedly Caucasian.

Stimuli

Ads containing audio or visual presentation of either death or non-death were used as stimuli. Both death and non-death messages were "negative" ads in that they addressed damaging consequences of cigarette use. Death messages were operationalized according to intrinsic message features; they explicitly – either visually or verbally – addressed death (e.g., images of bodybags and/or voiceovers stating that cigarettes kill). Non-death messages were also operationalized according to intrinsic message features as they either visually or verbally addressed damage or disease caused by cigarette smoking (e.g., images of smoke entering and destroying human lungs and/or voiceovers stating that cigarettes rot a smoker's lungs).

Fourteen 30-second anti-tobacco messages were sampled to create message variance within each portion of the study (seven death/seven non-death). This helped to ensure that individual ad effects were minimized as well as helped to control for secondary message features (e.g. fear, humor) which could possibly confound the results. Reeves and Geiger (1994) suggest that sampling messages in this was improves the accuracy of observations about the messages as well as reduces systematic between-message differences.

The ads were taken from the Media Campaign Resource Center database from 1999 to the present. Actual ads were used (as opposed to those created in a media lab) so that findings could be generalized to such advertisements. Television advertisements were chosen as they are commonly used in disease prevention and health promotion campaigns (Atkin & Marshall, 1996).

Stimuli Selection. Prior to use in the study, a total of 64 ads were content analyzed for intrinsic message features of death or non-death. Each ad was determined to be targeted to older teens and young adults (approximately ages 18-24). In addition, each ad was pre-tested for emotional response. A total of 23 undergraduate and Master's journalism students took part in the pre-test. They rated each message using an abbreviated version of the Self-Assessment Mannikin (SAM), using only the hedonic valence (pleasant/unpleasant) and arousal (boring/excited) portions measured on a 5-point scale, to gauge emotional response to the ads (Lang, 1995). The original scale had a measure for dominance which was not used in this study.

Those ads with mean scores between 2.5 and 3.3 for valence and between 1.8 and 2.4 for arousal were used in this study. This ensured that emotional responses to each ad were similar (i.e., negative-neutral) and that highly arousing messages in either group could not influence subsequent participant responses.

Manipulation Check. Because the stimuli were defined in terms of message properties of being either a death or non-death anti-tobacco message, no need for a manipulation check existed as the stimuli either are or are not death messages (O'Keefe, 2003).

Measures

The dependent measures used in this study were: anxiety, cultural worldview defense, smoking responsibility, overall attitude toward "others," behavioral intent, and social consensus.

Demographics. At the end of the study, participants were asked to complete demographic questions regarding age, gender, race, and level of education. Gender, education, and race were indicated on nominal measures. Age was indicated using an interval measure.

Anxiety. This study examined the anxiety questions from the abbreviated clinical Depression Anxiety Stress Scale (DASS-21). A total of seven questions addressed apprehension, panic, shakiness, dryness of the mouth, pounding of the heart, breathing difficulties, and worries about loss of control (1=does not apply to me at all, 5=applies to me very much). Higher values on this scale indicate greater levels of anxiety experienced.

Cultural Worldview Defense. Cultural worldview defense was addressed by asking participants a total of 26 questions on 5-point scales (1=strongly disagree, 5=strongly agree) about whether tobacco companies were lying, scheming, manipulators and purveyors of death; whether there should be stronger limitations on cigarettes; whether there should be harsher punishments for sellers/promoters of cigarettes; whether individuals should be penalized for anti-social smoking choices; and whether tobacco products are destructive.

Following data entry and recoding, the 26 items were factor analyzed using principle component analysis with varimax rotation. The factor analysis produced six factors with qualifying eigenvalues (over 1.0). Factor loadings of .50 were considered significant. Items that either did not load on a factor or loaded similarly on two or more factors were dropped. The six remaining factors (tobacco promotion, individual penalties, cigarette restrictions, buying & selling limits, product destructiveness, and smoker's choices) accounted for 15, 13, 13, 11, 9, and 6 percent of the explained variance, respectively (67% total).

Reliability analyses were then conducted on each of the six factors. *Tobacco promotion* consisted of four items: should not be allowed to promote cigarettes through advertising, should not be allowed to sponsor events like NASCAR, should not be able to give away items with logos, and cigarette sponsorships should be restricted (alpha = .92). *Individual penalties* consisted of three items: penalties for smoking around children, penalties for smoking around pregnant women, penalties for smoking around ill persons (alpha = .94). *Cigarette restrictions* consisted of six items: heavy taxes for tobacco companies, restrictions on giving away free samples, banning smoking in workplaces, banning smoking from restaurants, banning smoking from bars, and raising the cigarette tax (alpha = .87). *Buying and selling limits* consisted of three items: stronger limitations on who can buy tobacco, stronger penalties for people who illegally sell tobacco, more severe fines for people who illegally buy tobacco (alpha = .90). *Product destructiveness* consisted of

three items: tobacco companies producing a product that kills, tobacco companies producing an addictive substance, tobacco companies producing a product that destroys lives (alpha = .74). *Smoker's choices* consisted of three items: people who smoke asking for smoking-related illnesses, people who smoke contracting diseases, and non-smoker's not having to deal with secondhand smoke-related illnesses (alpha = .67).

Smoking Responsibility. Blame and attitudes regarding smoking were addressed by asking participants a total of 12 questions on 5-point scales (1=strongly disagree, 5=strongly agree) about whether they felt that individuals or tobacco companies were to blame for smoking behaviors, as well as their general attitudes toward smokers. Following data entry and recoding, the 12 items were factor analyzed using principle component analysis with varimax rotation. The factor analysis produced three factors with qualifying eigenvalues (over 1.0). Factor loadings of .50 were considered significant. Items that either did not load on a factor or loaded similarly on two or more factors were dropped. The three remaining factors (individual blame, tobacco company blame, and general dislike of smokers/smoking) accounted for 12, 20, and 17, percent of the explained variance, respectively (49% total).

Reliability analyses were then conducted on each of the three factors. *Individual blame* consisted of three items: participants perceived that individual smokers were to blame; smokers were in control of their own smoking; smokers were the cause of their own smoking (alpha = .75). *Tobacco company blame* consisted of four items: participants perceived that the tobacco companies were to blame; tobacco companies were the cause of smoking behaviors; tobacco companies encouraged smoking; and if tobacco advertising was a cause of smoking behaviors (alpha = .74). *General dislike* consisted of three items: smokers were unlikable; smokers made them angry; and if there was a stigma attached to smoking (alpha = .67).

Social Consensus. This study examined social consensus by asking participants to indicate using ordinal measures how many adult smokers there are in the U.S. and in the state where the study took place. It was expected that smokers would overestimate each of these.

Behavioral intent. Intent to smoke in the future was measured on a 5-point scale (1=very unlikely, 5=very likely) wherein participants were asked to indicate how likely they were to smoke a cigarette in the next six months. In addition, current smokers were asked to indicate on an interval scale how much they wanted to quit smoking (1=not at all, 7=very much).

Procedure

Participants were randomly assigned to group experimental sessions. Following the informed consent process, participants viewed either seven death-specific anti-tobacco ads

or seven non-death anti-tobacco ads presented on a large projection screen using a laptop and computer projector. Audio was presented via in-room projection speakers.

Participants were then given a Suduko puzzle as a distractor task. This was done as previous TMT studies have shown that increased worldview defense and increased accessibility of death related thoughts emerge only after a delay and distraction (Burke, Martens, & Faucher, 2009; Arndt et. al., 1997). Their research suggests that following death manipulations, thoughts of death are initially suppressed. However, suppression was shown to be disrupted by cognitive load thereby increasing thoughts of death. Thus, a task which increases cognitive load, such as the Suduko used here, is effective in creating the appropriate delay and distraction necessary for participants to contemplate thoughts of death.

Finally, participants completed the questionnaire containing the dependent variables (anxiety, cultural worldview defense, blame, behavioral intent) and demographic questions. After completing the experiment, participants were given a receipt of participation, were debriefed as to the overall premise of the study, and again asked if they had any questions or concerns. The entire process took approximately 1/2 hour to complete.

RESULTS

This research was guided by the overall question: How do death-explicit anti-tobacco messages influence individuals compared to non-death messages? A total of five sets of hypotheses were examined based on previous findings regarding Terror Management Theory. In terms of analyzing data for the research questions and hypotheses, the statistical methods employed were repeated measures factorial ANOVAs and factorial MANOVAs. Unless otherwise noted, a significance criterion of .05 was used for each hypothesis test to protect against Type I error (this included changing experimentwise alphas to reflect an overall .05 when necessary).

Anxiety

Hypothesis 1a suggested that anxiety levels for those who view the death-explicit ads would be greater than the anxiety levels of those who view the non-death ads. This hypothesis was not supported as no effects of message emerged. Hypothesis 1b suggested that anxiety levels of smokers will be greater than the anxiety levels of non-smokers. This hypothesis was supported as the ANOVA indicated a significant main effect of smoking status on anxiety experienced, $F(1,112) = 13.86$, $p<.01$, which is a moderate effect ($n^{2p} = .11$). Smokers were significantly more likely to indicate experiencing anxiety ($M = 13.83$) than non-smokers ($M = 10.65$). The results of the ANOVA are shown in Table 1 and the means and standard deviations are shown in Table 2.

Table 1 - ANOVA Results

Source	*Sum of Squares*	*df*	*Mean Square*	*F*	*p*	*Partial eta Squared*
Variable - Anxiety						
Message	5.03	1	5.03	.32	.56	.00
Smoking Status	213.60	1	213.60	13.86	.001	.11
Message * Smoking Status	4.41	1	4.41	.28	.59	.00
Error	1725.34	112	15.40			
Variable – Social Consensus (U.S.)						
Message	28.07	1	28.07	5.04	.02	.04
Smoking Status	.59	1	.59	.10	.74	.00
Message * Smoking Status	9.70	1	9.70	1.74	.18	.01
Error	628.63	113	5.56			
Variable – Social Consensus (Missouri)						
Message	3.99	1	3.99	2.09	.15	.01
Smoking Status	.00	1	.00	.00	.95	.00
Message * Smoking Status	3.83	1	3.83	2.01	.15	.01
Error	215.14	113	1.90			
Variable – Behavioral Intent						
Message	.05	1	.05	.13	.71	.00
Smoking Status	179.30	1	179.30	469.64	.001	.81
Message * Smoking Status	.19	1	.19	.52	.47	.00
Error	41.61	109	.38			

Cultural Worldview Defense

Hypothesis 2a suggested that cultural worldview defense for those who viewed the death-explicit ads would be greater than cultural worldview defense of those who viewed the non-death ads. This hypothesis was supported as results of the MANOVA indicated that there was a significant multivariate effect of message type (death/non-death) on cultural worldview defense, $F(6,108) = 2.91$, $p < .01$, $n^{2p} = .13$. Participants who viewed death messages (M= 14.28) were significantly more likely to prescribe harsher

Table 2 – Means & Standard Deviations for ANOVAs

Variable - Anxiety			
Message	***Smoking Status***	***Mean***	***Standard Deviation***
Death Message	Non-smoker (*n*=42)	10.66	3.83
	Smoker (*n*=17)	14.23	3.84
Non-death Message	Non-smoker (*n*=44)	10.63	3.17
	Smoker (*n*=13)	13.30	6.12
Total (*n*=116)	Non-smoker (*n*=86)	10.65a	3.49
	Smoker (*n*=30)	13.83a	4.89
Variable – Social Consensus (U.S.)			
Message	***Smoking Status***	***Mean***	***Standard Deviation***
Death Message	Non-smoker (*n*=42)	5.59	2.53
	Smoker (*n*=17)	6.41	2.00
Non-death Message	Non-smoker (*n*=44)	5.13	2.32
	Smoker (*n*=14)	4.64	2.27
Total (*n*=117)	Non-smoker (*n*=86)	5.36	2.42
	Smoker (*n*=31)	5.61	2.27
Variable – Social Consensus (MO)			
Message	***Smoking Status***	***Mean***	***Standard Deviation***
Death Message	Non-smoker (*n*=42)	3.69	1.31
	Smoker (*n*=17)	4.11	1.57
Non-death Message	Non-smoker (*n*=44)	3.68	1.37
	Smoker (*n*=14)	3.28	1.32
Total (*n*=117)	Non-smoker (*n*=86)	3.68	1.33
	Smoker (*n*=31)	3.74	1.50
Variable – Behavioral Intent			
Message	***Smoking Status***	***Mean***	***Standard Deviation***
Death Message	Non-smoker (*n*=42)	1.07	.34
	Smoker (*n*=14)	3.92	1.26
Non-death Message	Non-smoker (*n*=44)	1.02	.15
	Smoker (*n*=13)	4.07	1.11
Total (*n*=113)	Non-smoker (*n*=86)	1.04a	.26
	Smoker (*n*=27)	4.00a	1.17

Note: Means in the same column sharing the same letter subscript differ at $p < .05$.

Table 3 - *MANOVA Results for Cultural Worldview Defense*

Multivariate Analysis of Variance for Group						
Source	***Wilks' Lambda***	***F***	***Hyp. df***	***Error df***	***p***	**Partial η^2**
Message	.86	2.91	6.00	108.00	.01*	.13
Smoking Status	.72	6.74	6.00	108.00	.001*	.27
Message * Smoking Status	.94	.99	6.00	108.00	.43	.05

Univariate Analysis of Variance for Group							
Source	***Dependent Variable***	***SS***	***df***	***MS***	***F***	***p***	**Partial η^2**
Message	Tobacco promotion	8.08	1	8.08	.35	.55	.00
	Individual penalties	32.82	1	32.82	3.53	.06	.03
	Cigarette restrictions	93.03	1	93.03	3.20	.07	.02
	Buying & selling limits	68.65	1	68.65	6.57	.01*	.05
	Product destructiveness	65.87	1	65.87	11.86	.001*	.09
	Smoker's choices	4.55	1	4.55	.77	.38	.00
Smoking Status	Tobacco promotion	154.89	1	154.89	6.81	.01*	.05
	Individual penalties	46.81	1	46.81	5.04	.02	.04
	Cigarette restrictions	819.91	1	819.91	28.28	.001*	.20
	Buying & selling limits	143.68	1	143.68	13.75	.001*	.1
	Product destructiveness	124.03	1	124.03	22.34	.001*	.16
	Smoker's choices	22.78	1	22.78	3.84	.05	.03
Message * Smoking Status	Tobacco promotion	3.21	1	3.21	.14	.70	.00
	Individual penalties	15.87	1	15.87	1.70	.19	.01
	Cigarette restrictions	16.36	1	16.36	.56	.45	.00
	Buying & selling limits	9.52	1	9.52	.91	.34	.00
	Product destructiveness	25.95	1	25.95	4.67	.03	.04
	Smoker's choices	1.44	1	1.44	.24	.62	.00

Error	Tobacco promotion	2568.30	113	22.72
	Individual penalties	1049.60	113	9.28
	Cigarette restrictions	3276.11	113	28.99
	Buying & selling limits	1180.64	113	10.44
	Product destructiveness	627.32	113	5.55
	Smoker's choices	669.06	113	5.92

*Note: * Indicate significance at the p<.01 level.*

Table 4 - *Mean Scores on Cultural Worldview Defense Variables for Each Group*

	Variable					
Group	tobacco promotion	individual penalties	cigarette restrictions	buying & selling limits	product destructiveness	smoker's choices
NSD (n=42)						
M	13.36	13.07	26.40	13.05	12.98	12.81
SD	4.19	2.26	2.97	2.26	1.64	2.63
SD (n=17)						
M	11.12	12.47	21.23	11.18	11.71	12.06
SD	4.74	3.02	5.33	2.96	2.93	2.38
NSND (n=44)						
M	13.14	12.70	25.23	11.95	12.34	12.61
SD	5.35	3.39	6.41	3.76	2.46	2.64
SND (n=14)						
M	10.14	10.43	18.36	8.79	8.93	11.36
SD	4.45	3.94	7.28	4.14	3.02	2.50
TOTAL (n=117)						
M	12.56	12.53	24.25	11.85	12.07	12.45
SD	4.85	3.11	5.98	3.45	2.63	2.45

Notes: NSD = non-smokers who viewed death messages, SD = smokers who viewed death messages, NSND = non-smokers who viewed disease messages, SND = smokers who viewed disease messages.

punishments/limitations for tobacco companies than participants who viewed non-death messages (*M*= 12.99).

Hypothesis 2b suggested that cultural worldview defense levels of smokers would be greater than the cultural worldview defense levels of non-smokers. This hypothesis was also supported as there was a significant multivariate effect of smoking status (smoker/non-smoker) on cultural worldview defense, $F(6,108) = 6.74$, $p < .01$, $n^{2p} = .27$. Participants who did not smoke (*M*= 14.96) were significantly more likely to prescribe harsher punishments/limitations for tobacco companies than participants who did smoke (*M*= 12.31). Table 3 shows the multivariate and univariate results of the MANOVA.

Although not hypothesized, there were significant findings for the four of the six measures of cultural worldview defense (i.e., tobacco promotion, individual penalties, cigarette restrictions, buying & selling limits, product destructiveness, smoker's choices). There were significant univariate effects of message type on the cultural worldview defense measures of buying and selling limits, $F(1,113) = 6.57$, $p < .01$, $n^{2p} = .05$), and product destructiveness, $F(1,113) = 11.86$, $p < .01$, $n^{2p} = .09$. Participants in the death message group were more likely to suggest higher buying and selling limits on cigarettes (*M* = 12.11) than those in the non-death message group (*M* = 10.37). Participants in the death message group were also more likely to state that more likely to state that tobacco companies produced an addictive, deadly product (*M* = 12.34) than those in the non-death message group (*M* = 10.64).

There were also significant univariate effects of smoking status on the cultural worldview defense measures of tobacco promotion, $F(1,113) = 6.81$, $p < .01$, $n^{2p} = .05$), cigarette restrictions, $F(1,113) = 28.28$, $p < .01$, $n^{2p} = .20$), buying and selling limits, $F(1,113) = 13.75$, $p < .01$, $n^{2p} = .10$), and product destructiveness, $F(1,113) = 22.34$, $p < .01$, $n^{2p} = .16$). Non-smokers were more likely to likely to indicate that tobacco companies should not be able to promote cigarettes (*M* = 13.25) than smokers (*M* = 10.63). Non-smokers were more likely to suggest greater restrictions on cigarettes (*M* = 25.82) than smokers (*M* = 19.80). Non-smokers also suggest greater buying and selling limits on cigarettes (*M* = 12.50) than smokers (*M* = 9.98). Non-smokers were also more likely to state that tobacco companies produced an addictive, deadly product (*M* = 12.66) than smokers (*M* = 10.32). Table 4 shows the means and standard deviations for each of the cultural worldview defense variables.

Smoking Responsibility

Hypothesis 3a suggested that individuals who viewed the death-explicit ads would be more likely to allocate smoking responsibility to tobacco companies and smokers than individuals who viewed the non-death ads. This hypothesis was not supported as no effects of message emerged. Hypothesis 3b suggested that non-smokers would rate smoking

Table 5 - *MANOVA Results for Smoking Responsibility*

Multivariate Analysis of Variance for Group						
Source	***Wilks' Lambda***	***F***	***Hyp. df***	***Error df***	***p***	**Partial η^2**
Message	.98	.66	3.00	111.00	.57	.01
Smoking Status	.76	11.61	3.00	111.00	.001*	.23
Message * Smoking Status	.95	1.74	3.00	111.00	.16	.04

Univariate Analysis of Variance for Group							
Source	***Dependent Variable***	***SS***	***df***	***MS***	***F***	***p***	**Partial η^2**
Message	Blame Tobacco	9.78	1	9.78	1.05	.30	.00
	Dislike	7.84	1	7.84	1.17	.28	.01
	Blame Individual	.08	1	.08	.01	.89	.00
Smoking Status	Blame Tobacco	114.25	1	114.25	12.27	.001*	.09
	Dislike	136.80	1	136.80	20.48	.001*	.15
	Blame Individual	21.95	1	21.95	4.62	.03	.03
Message * Smoking Status	Blame Tobacco	8.68	1	8.68	.93	.33	.00
	Dislike	30.84	1	30.84	4.62	.03	.03
	Blame Individual	1.25	1	1.25	.26	.60	.00
Error	Blame Tobacco	1051.45	113	9.30			
	Dislike	754.59	113	6.67			
	Blame Individual	536.31	113	4.74			

*Note: * Indicate significance at the p<.01 level.*

responsibility levels higher than smokers. This hypothesis was supported as results of the MANOVA showed that there was a significant multivariate effect of effect of smoking status (smoker/non-smoker) on smoking responsibility, $F(3,111) = 11.61$, $p < .01$, $n^{2p} = .23$. Participants who did not smoke (M= 11.37) were significantly more likely to place the blame for smoking behaviors on the individual and tobacco companies than participants who

did smoke (M= 9.48). Results for the three measures of blame (i.e. tobacco companies & promotion as cause, dislike of smoker's actions, individual as cause) are shown in Table 5.

Although not hypothesized, there were significant univariate effects of smoking status on the smoking responsibility measures of tobacco company blame, $F(1,113) = 12.27$, $p < .01$, $n^{2p} = .00$), and dislike of smokers, $F(1,113) = 20.48$, $p < .01$, $n^{2p} = .01$). Non-smokers were more likely to likely to indicate that tobacco companies were to blame for smoking behaviors ($M = 12.31$) than smokers ($M = 10.06$). Non-smokers were more likely to indicate that they disliked smokers and smoking behaviors ($M = 10.05$) than smokers ($M = 7.59$). Table 6 shows the means and standard deviations for each of the smoking responsibility variables.

Social Consensus

Hypothesis 4a suggested that individuals who viewed the death-explicit ads would be more likely to overestimate the percentage of individuals who smoke versus individuals who viewed the non-death ads. This hypothesis was supported as the ANOVA indicated a significant main effect of message type on perception of smoking in the U.S., $F(1,113) = 5.04$, $p<.05$, which is a small effect ($n^{2p} = .04$). Individuals in the death message group were significantly more likely to perceive the number of smokers in the U.S. to be greater ($M = 5.83$) than individuals in the non-death message group ($M = 5.02$). Hypothesis 4b suggested that smokers would be more likely to overestimate the percentage of individuals who smoke versus non-smokers. This hypothesis was not supported as no effects of smoking status emerged. The results of the ANOVA are shown in Table 1 and the means and standard deviations are shown in Table 2.

The ANOVA indicated no significant main effects of smoking status, $F(1,113) = .00$, $p>.05$, or message type, $F(1,113) = 2.09$, $p>.05$, on perception of smoking in the state (Missouri) where the study took place. The results of the ANOVA are shown in Table 1 and the means and standard deviations are shown in Table 2.

Behavioral Intent

Hypothesis 5a suggested that individuals who viewed the death-explicit ads would be more likely to state they would not smoke in the future versus individuals who viewed the non-death ads. This hypothesis was not supported as no effects of message emerged. Hypothesis 5b suggested that smokers would be more likely to state they will smoke in the future versus non-smokers. This hypothesis was supported as the ANOVA indicated a significant main effect of smoking status on intent to smoke in the future, $F(1,109) = 469.64$, $p<.01$, which is a large effect ($n^{2p} = 81$). Smokers were significantly more likely to indicate

Table 6 - *Mean Scores on Smoking Responsibility Variables for Each Group*

	Variable		
Group	Tobacco companies & promotion as cause	Dislike of smoker's actions	Individual as cause
NSD (n=42)			
M	12.33	9.76	11.69
SD	2.35	2.73	2.31
SD (n=17)			
M	10.71	8.47	10.94
SD	3.20	2.62	1.89
NSND (n=44)			
M	12.29	10.34	11.86
SD	3.45	2.57	2.14
SND (n=14)			
M	9.43	6.71	10.64
SD	3.39	2.05	2.20
TOTAL (n=117)			
M	11.74	9.43	11.52
SD	3.18	2.81	2.20

Notes: NSD = non-smokers who viewed death messages, SD = smokers who viewed death messages, NSND = non-smokers who viewed disease messages, SND = smokers who viewed disease messages.

intent to smoke in the future (M = 4.0) than non-smokers (M = 1.04). The results of the ANOVA are shown in Table 1 and the means and standard deviations are shown in Table 2.

DISCUSSION

The present study provides interesting results regarding death-explicit anti-tobacco messages versus non-death anti-tobacco messages. Specifically, results indicate that death explicit anti-tobacco messages influence cultural worldviews as well as perceptions of social consensus regarding smoking. Smoking status was found to play a large part in determining attitudes and behaviors as smokers: 1) prescribed lesser punishments for tobacco companies and others who smoke, 2) suggested fewer restrictions on cigarette advertising, 3) suggested fewer buying and selling limitations for cigarettes, 4) underrated the destructive consequences of smoking, 5) were less likely to blame tobacco companies or smokers for smoking behaviors, 6) were less likely to dislike smokers or smoking behaviors, and 7) were more likely to smoke in the future than non-smokers. This indicates that following death-

explicit messages, smokers strongly clung to their cultural worldview that smoking is an acceptable behavior.

Results of our study also showed that death-explicit anti-tobacco messages did not significantly influence anxiety, attribution of smoking responsibility, or behavioral intent. The latter finding is disappointing in that it was hoped that death-explicit messages would increase an individual's overall desire to perform socially acceptable behaviors, specifically in desire to abstain from or give up smoking behaviors. It is likely that smokers in the death message group engaged in one of the defensive maneuvers discussed earlier: 1) avoidant thinking, 2) situation redefinition, 3) denying vulnerability, or 4) emphasizing temporal remoteness thereby decreasing their need to change their future behaviors (Burke, Martens, & Faucher, 2009).

Not surprisingly, individuals who smoke were significantly more likely to indicate that they would smoke in the future as opposed to non-smokers. More interesting - though not statistically significant in this study - was that smoking individuals who saw death messages were less likely to indicate that they would smoke in the future (M = 3.93) and more likely to indicate a greater desire to quit (M = 3.06) than smokers who saw non-death messages (M = 4.08 and M = 2.56, respectively). However, increasing the sample of smoking individuals would probably result in significant findings for both of these as the total smokers sampled in this study was only 31. Thus, our likelihood of making a Type II error would be decreased by increasing the statistical power of the study.

Overall, smokers who viewed death messages experienced the greatest amount of anxiety (M=14.23) followed by smokers in the non-death message group (M=13.30), however, these results were not statistically significant. Shehryar and Hunt (2005) found similar results in regard to drinking and driving messages where participants held similar fear evaluations for death versus physical harm or social embarrassment. They suggested that in some situations, people may feel equally threatened by fear of death as fear of other negative consequences. In the case of anti-tobacco messages, fear of disease or bodily harm may hold the same influence on attitudes and behaviors as fear of death. That is, people may fear lung cancer as much as they fear death. Regardless, participants in this study did report more anxiety following the death message than the non-death message indicating that they did at least initially feel more apprehension and concern about death-consequences.

Caveats

The major limitation of this study was the small sample of smokers. The current climate regarding smoking behaviors may have had something to do with the low smoker turnout. The city where the study took place recently enacted no smoking ordinances in public places and is considering enacting the same measures on campus. This may have made many smokers not wish to participate in a study where they would view anti-tobacco

messages. As noted earlier, they may have made a conscious decision regarding their cultural worldviews and decided not to subject themselves to messages which attack their behaviors.

Future Research

Some studies have shown that fear influences message processing with low to moderate levels of fear increasing processing (Rogers & Prentice-Dunn, 1997; Dillard et al., 1996; Millar & Millar, 1996). Future studies should examine what level of fear of death is necessary to increase message processing. For example, current drinking and driving ads often utilize highly explicit "fear of death" messages (e.g., showing dead bodies at the scene of an auto accident) versus less explicit "fear of death" messages (e.g., showing a video tape of an individual who was killed by a drunk driver). Studies comparing similar types of anti-tobacco messages could focus on processing differences among low/moderate/high fear of death messages to see which is encoded more fully.

Obviously, anti-tobacco messages which stress death as a consequence are a fear manipulation designed to get smokers to stop smoking. Future research should be undertaken examining smokers only and their reactions not only to death versus non-death messages, but their reactions to varying levels of death manipulations as it would be interesting to see if varying levels of death visualized or mentioned result in increases in physiological arousal such as heart rate and electrodermal activity. In effect, does the anxiety experienced following a death manipulation have measurable physiological manifestations? Furthermore, is the level of anxiety for painful consequences similar to that of death? Such effects could influence cognitive processing, as well as studies have shown that arousal automatically increases the resources allocated to processing a message (Lang et. al., 2004).

Implications

Terror Management Theory offers a unique perspective on why different types of fear appeals are more or less likely to work. In this instance, death explicit anti-tobacco ads caused heightened anxiety (for smokers only), cultural worldview defense (particularly in the case of smokers who defended their behaviors), and influenced attribution of responsibility. Non-smokers who took part in our study advocated more severe punishments including buying and selling limits on cigarettes and restricting promotion of cigarettes. Non-smokers were also more likely to attack tobacco companies for producing a deadly product. Furthermore, those who saw death explicit ads thought more people in the U.S. smoke on a regular basis.

Though not statistically significant, smokers who viewed death messages were more likely to overestimate the number of smokers in the U.S. (M = 6.41) as well as overestimate the number of smokers in the state where the study took place (M = 4.12) than both non-smokers who viewed death messages (U.S. M = 5.60, Missouri M = 3.69) and those non-smokers (U.S. M = 5.14, Missouri M = 3.68) and smokers (U.S. M = 4.64, Missouri M = 3.29) who saw non-death messages. This suggests that smokers likely feel that they are in the minority and feel the need to overestimate the number of similar "others" they can cling to.

Overall, our results indicate that when viewing this type of fear appeal it is likely that smokers are so "entrenched" in smoking behaviors that they clung to their cultural worldview of smoking as acceptable, ignoring the anti-tobacco message. As noted by Burke, Martens, and Faucher (2009) "behaviors may be more powerful social statements as they are harder to undo than changing of attitudes" (p. 32). Though it appears as death explicit messages reinforced attitudes and behaviors for non-smokers, smokers were more likely to reject death explicit messages. This means that designers of death explicit anti-tobacco messages – specifically those aimed at teens or young adults – may be missing the mark. Instead of providing evidence of what this audience sees as "long term" effects of smoking they should focus on short term effects such as distorted social consensus, rejection by peers, or physical consequences such as bad breath.

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DIRECT-TO-CONSUMER ADVERTISING OF PREDICTIVE GENETIC TESTS: AN EXAMINATION OF CONSUMER ATTITUDES, BEHAVIORAL INTENTIONS AND INFORMATION SEEKING BEHAVIOR

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Direct-to-consumer (DTC) advertising of predictive genetic tests (PGTs) has added a new dimension to health advertising directed at consumers. The objective of this study was to use an online survey to more fully understand consumers' responses, attitudes, behavioral intentions and information seeking behavior in response to a fictitious PGT-DTC advertisement. Overall, consumers reported moderate intentions to talk with their doctor and seek more information about PGTs after DTC advertisement exposure. At this point in the PGT evolution, though, consumers did not seem ready to take the advertised test or engage in active information search based on the DTC ad. However, consistent with the Theory of Reasoned Action theoretical framework, those with greater behavioral intentions did engage active information search significantly more. Marketers will need to continue educating consumers and providers, in particularly physicians, about PGTs use, validity and place in the healthcare market.

Keywords: advertising, predictive genetic tests, behavioral intentions

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Direct-to-consumer (DTC) advertising has been employed by pharmaceutical companies as an educational and promotional instrument to encourage consumers to seek expert (i.e. physician) opinions about prescription pharmaceutical products. Recently, increasing numbers of biotech companies have begun using the DTC strategy for their predictive genetic tests (PGTs) (Tracy, 2007; Lachance et al. 2010; McBride, Wade & Kaphingst 2010), evidenced by the 64% increase in the number of companies advertising PGTs between 2003 and 2008 (Hogarth, Javitt & Melzer, 2008; Liu and Pearson 2008). Myriad Genetics (www.myriad.com), a molecular diagnostic company, launched the first DTC advertising campaign for a predictive genetic test (PGT) for breast cancer (BRCA I & BRCA II) to a broad consumer audience in October 2003 (Tsao, 2004) and has continued this strategy, including a recent television heavy campaign in specific markets.

Ideally, DTC advertisements for PGTs would educate and make consumers aware of their genetic healthcare options and the associated risks. However, this advertising practice does not come without controversy, as the issue of genetics and health care has spurred continual debate. Proponents of PGTs DTC advertising[1] claim increased awareness of these tests can encourage consumers to consult with physicians or genetic counselors to make well informed decisions about their genetic healthcare needs (Liu and Pearson, 2008). Proponents also argue that learning about the tests can help consumers take steps to minimize their disease risks, thereby optimizing their health (Krasner, 2003).

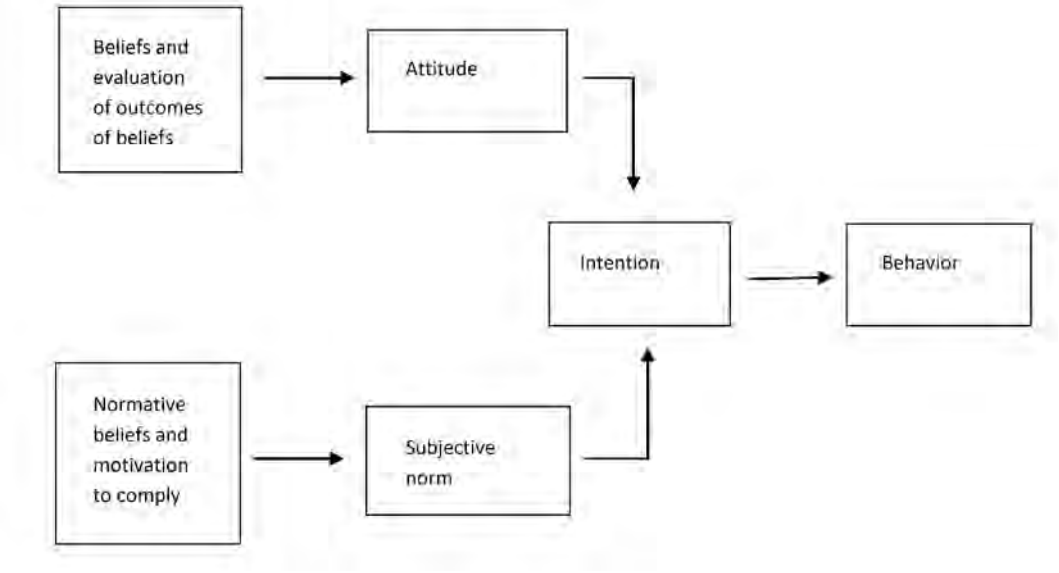
In contrast, opponents fear the risks of advertising PGTs outweigh any possible benefits and may create unnecessary demand, especially when most currently available tests lack sufficient evidence establishing the tests' clinical validity or utility (Bloss, Schork & Topol 2011; McBride, Wade & Kaphingst 2010; Kutz, 2010; Hunter, Khoury and Drazen, 2008; Javitt and Hudson, 2006; Krasner, 2003; Gollust, Hull and Wilfond, 2002). Critics perceive PGT ads to be of limited educational value, especially due to the complexity of genetic information and the fact that not everyone will develop the disease (McBride, Wade & Kaphingst 2010; Lachance et al. 2010; Taylor, 2004; Lenzer, 2007; Javitt and Hudson, 2006). Opponents also report negative physician attitudes towards marketing of PGTs, increased financial burden and the potential for insurance discrimination for patients taking a PGT (Bloss et al. 2010; McBride, Wade & Kaphingst 2010; Berg and Fryer-Edwards 2008; Tracy 2007; Vadaparampil et al. 2007; Vadaparampil et al. 2005).

Over time, measuring behavioral intentions has been vital to marketing and psychology research, as intent is frequently used to predict future behavior. This idea originated with the Theory of Reasoned Action (TRA) proposed by Fishbein (1975) and

[1]In the predictive genetic test (PGT) market, most do not require a prescription. Therefore, in addition to the advertising of these products directly to consumers, these products are also for purchase directly by consumers since they do not require a prescription. For the purposes of this research, the focus is placed on those PGTs advertised directly-to-consumers as opposed to the "offering" of PGTs direct-to-consumer.

Figure 1

Theory of Reasoned Action



Ajzen (1980) to help explain/predict consumer behavior (Figure 1). The TRA proposed that attitudes and subjective norms, or perceived social pressure, influence behavioral intentions, the direct antecedent of actual behavior. Not only has the theory provided a useful framework to understand behaviors such as watching television or using the internet, but the TRA has also been used in understanding the use of coupons and various health-related behaviors (Loken, 1983; Njite and Parsa, 2005; Shimp and Kavas, 1984; Brinberg and Cummings, 1984; Burnett, Steakley and Tefft, 1995; Creedon, 2006; Zivin and Kales, 2008).

Therefore, given the increasing potential for the advertising and use of predictive genetic tests and risks associated with them, it is important to understand the impact of DTC advertisements of PGTs on consumer behavior. Based on the TRA framework, this research sought to investigate consumer behavioral intentions in response to a PGT-DTC ad. This should help marketers and policy makers evaluate the current extent of the influence of PGT-DTC ads on general consumers. Past literature has documented expert opinions on the appropriateness of genetic tests and their offering (i.e. ability to purchase without a prescription) directly to consumers (McBride, Wade & Kaphingst 2010; Berg and Fryer-Edwards 2008). However, the only empirical research examining consumer response to DTC advertising of PGTs was conducted based on Myriad's DTC ad campaign described above,

which showed a majority of survey participants[2] recalled seeing the ads but little action was taken to obtain a test (Lowery et. al 2008; Mouchawar, et. al 2005). As a start toward filling this void, this study observationally investigated the impact of PGT-DTC ads on consumers' behavioral intentions and propensity to seek more information about the advertised test. The specific research questions are presented below:

Do PGT-DTC ads stimulate consumers' to:
Report higher intentions to talk with their physician (test inquiry intent)?
Seek more information about the advertised test (information search intent)?
Report higher intentions to take the test?
Do consumer attitudes and subjective norms influence behavioral intentions in response to a PGT DTC ad?
Do consumers' behavioral intentions in response to the PGT-DTC ad correspond to a pre-defined behavioral measure?

METHODS

A quantitative, observational cross-sectional survey was conducted to evaluate consumers' intentions and behavior associated with predictive genetic test advertising. Qualtrics online survey software (www.qualtrics.com) and consumer panel, all above 18 years of age, were used to administer the survey. A fictitious genetic test (RTF®) for multiple health conditions (Alzheimer's disease, rheumatoid arthritis, colon, lung and pancreatic cancer) was chosen for this study to ensure sufficient respondents with a family history of disease. Further, these conditions have genetic tests currently available in the marketplace. The ad stimulus (Appendix I) mirrored existing PGT print ads in the marketplace and was based off Myriad's BRCA PGT print advertisement. The subjects were asked three introductory demographic questions, then viewed the ad stimulus and finally were given a description of the research, examples of how to complete the survey and then responded to the pre-tested, self-administered questionnaire. Further, during the questionnaire, respondent were allowed to click a link to view the ad again with each question.

The operational definitions of the variables examined in this study include:

Test Inquiry Intent (TII): the likelihood consumers will inquire about the advertised test during their next physician visit.

Information Search Intent (ISI): the likelihood the consumer will seek more information about the advertised test during the next week.

[2]Only females were surveyed in this research given they were the target market of the ad campaign.

Intention to take the test (ITT): the likelihood the consumer will take the advertised test within the next three months.

The preceding three constructs were measured using a three-item, seven-point semantic differential scale (e.g., 1 = "Unlikely," 7 = "Likely") adapted to the specific construct from the scale developed by Mackenzie, Lutz and Belch (1986) (Appendix II). Information Search Intent (ISI) and a composite mean of the three intention measures (TII, ISI & ITT) were also subdivided into those respondents with high (mean > four on the 7-point scale) and low behavioral intentions for chi-square analysis.

Attitudes towards test inquiry intent (ATT_TII): the consumers' affective evaluations about talking with their doctor regarding the advertised genetic test. A four-item, seven-point semantic differential scale (including, e.g., 1 = "Bad," 7 = "Good") adapted from Muehling and Laczniak's (1988) attitude scale was used (Appendix II).

Subjective norms (SN): "one's perception of important others opinion of the individual talking to their doctor about the test" (Fishbein, 1980) and measured using a three-item, seven-point Likert-type scale (1 = "Strongly Disagree," 7 = "Strongly Agree") (Appendix II). Both attitudes and subjective norms were assessed in terms of the respondent speaking to their physicians, as this is a demonstration of their intent to seek information.

Information Search Behavior (ISB): the consumers' actual search for information by clicking on a provided link at the end of the survey. It was assessed with a one-item, dichotomous choice option (yes/no) coded as 1 = "look for more information now" and 2 = "do not look for more information now". This single item ISB measurement scale has been used in prior DTC research and demonstrated equivalence to multiple item measures (Bergkvist and Rossiter, 2007; Rollins, 2010).

SAS Version 9.1 was used for data analysis. For the first objective, descriptive statistics were examined while the second objective was assessed via linear regression analysis. The behavior measure was analyzed using descriptive statistics and chi-square techniques. A minimum sample size of 160 was determined with power set at 0.8, an a priori alpha level of 0.05 and, based on lack of previous research examining this phenomenon, a medium effect size (f = 0.10) (Cohen, 1988).

RESULTS

Four-hundred and ten surveys were completed within 24 hours of deployment and included in the analyses. Respondent demographics are detailed in Table 1. Only 11.2 % of the respondents had ever seen an advertisement for a predictive genetic test. The majority of respondents were female (64.9%) and Caucasian (76.3%), while 42% of participants had completed at least a four year college degree. Comparison with the US census data (2000) showed the age, race and income breakdown of the participants were representative of the

Table 1 – Respondent Demographics

Variable	Categories	Frequency	Percent
Gender	Male	141	34.4
	Female	266	64.9
	Prefer not to answer	3	0.7
Education Level	Less than high school	4	1
	High school graduate or equivalent	98	23.9
	Associates/technical/vocational degree	45	11
	Completed some part of college but no degree	88	21.5
	College graduate	116	28.3
	Graduate school or higher	56	13.7
	Prefer not to answer	3	0.7
Race	American Indian or Alaska native	2	0.5
	Asian	21	5.1
	African American	32	7.8
	Hispanic or Latino	24	5.9
	Native Hawaiian or other pacific islander	1	0.2
	White	313	76.3
	Mixed	4	1
	Other	10	2.4
	Prefer not to answer	3	0.7
Age	18-25	55	13.4
	26-35	86	21
	36-45	53	12.9
	46-55	103	25.1
	56-65	81	19.8
	Above 65 years	31	7.6
	Prefer not to answer	1	0.2
Annual Income	<$15K	31	7.6
	$15K-$24999	51	12.4
	$25K-$34,999	45	11
	$35K-$49,999	74	18
	$50K-$74,999	95	23.2
	$75K-$99,999	48	11.7
	$100K or more	59	14.4
	Prefer not to answer	7	1.7
Ever seen an ad	Yes	46	11.2
	No	364	88.8

US population. However, the current study participants' education level was higher than the general US population. (US Census Bureau 2000 = 24%; respondent group = 42%). Further, the various scale reliabilities (coefficient alpha) ranged from 0.89 (attitude scale) to 0.93 (intent to look for information).

Table 2 – Consumer Intentions – Descriptive Results

Scale	1	2	3	4	5	6	7	Composite Mean
Test Inquiry Intent								**4.64 ± 1.70**
A – Unlikely….Likely	51	42	26	83	70	57	81	
B – Improbable….Probable	40	38	31	76	76	63	86	
C – Impossible….Possible	16	19	27	103	82	72	91	
Information Search Intent								**4.32 ± 1.86**
A – Unlikely….Likely	77	40	34	65	64	53	77	
B – Improbable….Probable	60	42	33	87	55	63	70	
C – Impossible….Possible	30	30	31	111	69	61	78	
Intention to Take the Test								**3.57 ± 1.86**
A – Unlikely….Likely	128	51	32	77	46	32	44	
B – Improbable….Probable	106	47	46	82	48	35	46	
C – Impossible….Possible	63	39	47	116	66	34	45	

Consumer Intentions

The response frequencies of the three consumer behavioral intentions (TII, ISI and ITT) measures are listed in Table 2. The responses for the three question scale were averaged together to obtain a composite/overall behavioral intention mean for the specific question set. Of the 410 respondents, 235 (57%, M > 4.0) exhibited test inquiry intent (TII), defined as a composite mean response greater than the scale's neutral value (95% CI = 52.84 - 61.16, overall mean = 4.64 ± 1.70). Fifty percent (204 of 410, M > 4.0) of respondents were interested in seeking more information (ISI) about the advertised genetic test (95% CI = 45.15 - 54.85, overall mean = 4.32 ± 1.86). However, only 132 consumers (32%, M > 4.0) exhibited intentions to take the test (95% CI = 27.48 - 36.52, overall mean = 3.57 ± 1.86).

Consumer Attitudes & Subjective Norms, Behavioral Intentions & Actual Behavior

Consumer attitudes and the associated subjective norms (Objective Two) were found to be significant predictors of overall behavioral intentions ($p < 0.001$, Adjusted $R^2 = 0.316$) (Table 3). For the behavior measure, 55 of 410 (13.4%) respondents performed the pre-defined information search behavior (95% CI = 5.0 - 21.8). This behavioral measure was then further analyzed based on respondent's behavioral intention measures and demographics.

In order to fully examine Objective Three, Information Search Intent (ISI) and a composite mean of the three behavioral intention measures (TII, ISI and ITT) was computed and respondents subdivided into high and low behavioral intentions based on the scale's neutral value. These two groups were then individually compared to the behavior measure using a 2 x 2 cross-tabulation and chi-square analysis. In both cases (ISI and composite

Table 3 – Regression Analysis of TRA Variables

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.565[a]	.319	.316	1.33621

a. Predictors: (Constant), SN_F, ATT_TLK_F

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	340.566	2	170.283	95.372	.000[a]
	Residual	726.679	407	1.785		
	Total	1067.244	409			

a. Predictors: (Constant), SN_F, ATT_TLK_F
b. Dependent Variable: BEH_INT

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.093	.319		-.291	.771
	ATT_TLK_F	.450	.064	.346	7.025	.000
	SN_F	.363	.061	.293	5.945	.000

a. Dependent Variable: BEH_INT

mean), those with higher behavioral intentions performed the behavior significantly greater (ISI chi-square = 20.53, $p < 0.001$ and Overall Behavioral Intention chi-square = 11.24, $p = 0.001$). Cross tabulations are presented in Tables 4 (ISI) and 5 (Overall Behavior Intentions).

In terms of the respondent demographics (Gender, Age, Race, Education Level & Income), only Race had a significant influence on behavioral intentions ($p = 0.05$, Table 6) and, thus, its influence on the behavior measure was examined. For Race, the comparison was made between Caucasians (76.3% of respondents) and non-Caucasians in a 2 x 2 cross-tabulation as above, with Caucasians performing the behavior measure significantly greater (chi-square = 13.33, $p < 0.001$).

DISCUSSION

Following the previously described Theory of Reasoned Action (TRA), this research suggests a moderate relationship between a predictive genetic test advertisement exposure and consumer intentions and behavior. Consumers were exposed to the PGT ad and then,

Table 4 – Cross-Tabulations
Information Search Intent (ISI) vs. Behavior

		Behavior		
		Yes	No	Total
ISI	Low	12	194	206
	High	43	161	204
	Total	55	355	410

- Pearson Chi-Square = 20.53, $p < 0.001$

based on their attitudes and subjective norms, developed behavioral intentions and exhibited behavior related to the advertisement. This result is significant considering a majority of consumers in the study were seeing an advertisement for a PGT for the first time. Though these advertisements are relatively new, consumers were able to process and react to these ads. The consistent exposure to prescription DTC ads over the last few decades is one possible explanation for this effect with another being the sample's average education greater than the general population.

In examining the individual TRA constructs (Attitudes and Subjective Norms); both consumer attitudes and subjective norms were significant predictors of consumer behavioral intentions, following TRA principles and showing important healthcare decisions related to genetic testing not only depend on consumers' personal attitudes about predictive genetic tests, but also on the normative beliefs of their family and friends. From a marketing perspective, these results suggest PGT-DTC marketers must pay close attention to the messages used in their advertising. Predictive genetics tests could be portrayed in a positive, educational and socially accepted manner, while scare tactics, or trying to induce consumer action by pointing out what could happen if a person does not find out their genetic profile, could possibly antagonize information seeking and physician discussion.

As an effect of increased PGT-DTC, it may be argued that with increasing availability of genetic tests, consumers will seek information from their doctors to help them decide whether the test is appropriate for them. However, studies show physicians have little formal education in genetics and are less confident about discussing genetic tests with their patients (Freedman et al. 2003; Acton et al. 2000). The current study demonstrated consumers might expect physicians to inform and guide them on issues related to PGTs. Hence, to meet this responsibility adequately, it is essential for medical practitioners (and/or medical associations, patient advocacy groups, etc.) to evaluate the development of guidelines to recommend or help patients reach an informed decision. It is also critical for medical education to evaluate the incorporation of genetics as a part of physicians' formal education

Table 5 – Cross-Tabulations
Overall Behavioral Intentions vs. Behavior

		Behavior		
		Yes	No	Total
Overall Behavioral Intentions	Low	15	182	197
	High	40	171	211
	Total	55	353	408

- Pearson Chi-Square = 11.24, p = 0.001

and, thus, ultimately their practice. This could increase physicians' confidence in evaluating the validity of these tests and discuss the benefits and risks of PGTs with their patients.

Further, federal regulators may want to consider guidelines and oversight of the information disseminated through PGT ads as they do with prescription DTC ads. Just as prescription DTC ads must present "fair balance" of risk and benefit information, regulators could consider developing similar guidelines for marketers to create advertisements that provide accurate and balanced information about these tests proposed benefits and known limitations, especially given the concerns in the literature of their clinical validity.

For the pre-defined behavior measure, even though respondents had positive intentions to seek more information regarding the PGT, only a small percentage (13.4%) actually performed the information search behavior. One possible explanation is the newness (only 11.2% of the sample had previously viewed a PGT DTC ad) and nature of predictive genetic testing. As these tests are not currently part of standard practice within the healthcare industry, consumers may not see these tests as important and worth personal time researching, but possibly worthy of more discussion with their physician. However, as noted above, those with high behavioral intentions performed the information search behavior significantly more. While these results are consistent with the Theory of Reasoned Action, they may also imply that it will take some time for consumers to begin to embrace DTC for PGTs.

This study was limited by use of a forced exposure to the ad stimulus. Hence, the ecological validity of the study findings should be interpreted in light of the fact that experimental settings deviated from natural ad exposure and could have influenced consumers to respond differently than usual. In addition, the current sample had an education level much higher than the general consumer. Although we measured consumer information seeking behavior, this measurement was made just based on one binary response question. In the future, researchers should direct consumers to websites that provide more information about PGTs and use more advanced tracking methods to provide increased validity to conclusions about behavior.

Table 6 – Regression Analysis of Demographic Variables

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.169[a]	.028	.019	1.60011

a. Predictors: (Constant), Section 18: Please answer the following questions about yourself What is the highest level of edu..., RACE, Which of the following categories describes your age?, What is your annual household income?

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	30.306	4	7.576	2.959	.020[a]
	Residual	1036.939	405	2.560		
	Total	1067.244	409			

a. Predictors: (Constant), Section 18: Please answer the following questions about yourself What is the highest level of edu..., RACE, Which of the following categories describes your age?, What is your annual household income?

b. Dependent Variable: BEH_INT

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.802	.434		11.069	.000
	INCOME	.035	.046	.040	.764	.445
	AGE	.108	.053	.102	2.046	.061
	RACE	-.170	.060	-.142	-2.846	.005
	EDUCATION LEVEL	-.053	.059	-.047	-.894	.372

a. Dependent Variable: BEH_INT

More research is also needed to identify the variables that might influence consumer behaviors related to information search and taking the test. This research does not uncover the specific information that consumers would like to see in the ads to make informed decisions. A promising line of research may be to understand what information consumers seek in advertisements of genetic tests and individual characteristics or factors that influence them to search for more information.

CONCLUSION

Consumers reported moderate intentions to talk with their doctor and seek more information about PGTs after DTC advertisement exposure. At this point in the evolution of PGTs, consumers did not seem ready to engage in active information search. However, as predicted, those with greater behavioral intentions performed the behavior significantly more. Future research should identify the drivers of behavioral intentions to better

understand what stimulates consumers to act on the information in a PGT advertisement. This information will also be useful for marketers and policy makers in designing marketing plans and public policy.

Similarly, healthcare professionals need to be better informed about PGTs given consumers' interest in talking with their doctors before deciding about taking the test. Thus for marketers, it is important to keep the doctor's adequately informed about these tests so as to not hinder the balance strived for in a patient-physician interaction. Medical schools and associations could not only incorporate genetics as a part of the formal education and practice for doctors, but also consider developing guidelines to aid physicians and guide patients to make informed decisions about PGTs.

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Appendix I

Are You Ready To Fight Disease Before It Starts?

If any of your family members have had:

- *Alzheimer's Disease*
- *Rheumatoid Arthritis*
- *Cancer (Breast Cancer, Colon Cancer, Lung Cancer, Pancreatic Cancer)*

then you may be at increased risk too.

Medical science has shown that we inherit many diseases from our ancestors. If someone in your family has been diagnosed with one of the above hereditary medical conditions, you too may be at increased risk. ***Early detection, along with proactive medical care, is proven to help reduce risk and save lives.***

Ask your doctor about RTF® genetic testing because understanding your risk is the first step to reducing it. RTF® analysis - a test that uses a simple painless cotton swab from your cheek - can help you understand your personal risk for developing any of these serious medical conditions. ***Proper risk assessment, along with a discussion of testing and medical options, is your chance to begin fighting a serious disease before it starts.*** *After RTF® analysis, you and your doctor can discuss effective choices and steps you can take to ensure your own health.*

Are You Ready To Fight Disease Before It Starts?

Talk to your doctor or call today for a free educational brochure.
www.RTF.com
1.800RTFGene(toll free)
RTF®Analysis

GENESIS®
Genesis Laboratories
New York, NY 10071
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Appendix II – Individual Questionnaire Items

1. **Test Inquiry Intent:** Based on your assessment of the RTF® test, please indicate your opinion by clicking the appropriate box that best describes how likely you are to talk to your doctor about RTF® genetic test during your next office visit.
   1 – Likely to 7 – Unlikely
   1 – Improbable to 7 – Probable
   1 – Possible to 7 – Impossible
2. **Information Search Intent:** Based on your assessment of the RTF® test, please indicate your opinion by clicking the appropriate box that best describes how likely you are to look for more information about RTF® genetic test within the next couple of weeks.
   1 – Likely to 7 – Unlikely
   1 – Improbable to 7 – Probable
   1 – Possible to 7 – Impossible
3. **Intention to Take the Test:** Based on your assessment of the RTF® test, please indicate your opinion by clicking the appropriate box that best describes how likely you are to take the RTF® genetic test within the next 3 months.
   1 – Likely to 7 – Unlikely
   1 – Improbable to 7 – Probable
   1 – Possible to 7 – Impossible
4. **Attitudes Towards Test Inquiry Intent:** Below you will find a list of descriptions that represents different feelings about the advertisement that you just read. Please indicate your opinion by clicking the appropriate box that best describes how you feel about talking to your doctor about the RTF® genetic test that you saw advertised.
   1 – Bad to 7 – Good
   1 – Wise to 7 – Foolish
   1 – Harmful to 7 – Beneficial
   1 – Useful to 7 – Useless
5. **Subjective Norms:** The next few questions ask what other people would think about you talking to your doctor about the RTF® genetic test you saw in the advertisement. I think that….
   1 – Strongly Disagree to 7 – Strongly Agree
   A. People who are important to me would think that I should talk to my doctor about the advertised RTF® genetic test.
   B. People who are important to me would approve of me talking to my doctor about the advertised RTF® genetic test.
   C. People who are important to me would be glad I talked to my doctor about the RTF® genetic test.

PREFERENCE FOR ONLINE HEALTH INFORMATION AMONG CHINESE

ANGELA Y. M. LEUNG, DORIS Y. P. LEUNG AND MIKE K. T. CHEUNG

If soon-to-be-aged (STBA) adults do not do well in disease prevention or chronic illness care, their health problems may add a heavy load to the health care system and its costs. Objective: This study aims to identify factors that were associated with Chinese STBA adults' preference for online health information (POHI). Methods: This is a secondary analysis of a cross-sectional survey conducted in 2005-2006 among Hong Kong adults. Results: Out of the 516 respondents, one-third indicated their preference to get health information via the Internet. Five significant independent factors were found to be associated with POHI: 10th grade education or above, being employed, perceiving they had good language ability, knowing someone who could teach them, and Chinese who placed a higher value on learning as they grew older. Conclusions: With these findings, practitioners could work out some ways to support STBA adults for online health-related learning and health literacy.

Keywords: health literacy, Chinese, Internet, online health information

Chinese societies are predicted to become one of the largest groups of Internet users in the next decade (Lai, Arthur, & Chau, 2004). There has been a tremendous growth in Internet use in China, which reached 298 million "netusers" at the end of 2008, which surpassed the average level in the world, according to the China Internet Network Information Centre (China Internet Network Information Center, 2009). In Hong Kong, a Special Administrative Region (SAR) in China, about 3.4 million persons aged 10 or above had used Internet service at least once per week in 2008, while 800 thousand households

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(37% of households in Hong Kong) had purchased a personal computer or related products or services in that year (Census and Statistics Department, 2008). These figures indicate that using the Internet and information technology are very common in Chinese society. With the rapid increase in Internet use in their daily lives, more people have been searching for health information from the Internet and they value the quality of health information they find on the web (Leung, 2007; Leung, 2008). Previous studies of online health-related activities mainly focused on Caucasian adolescents (Cheuk & Chan, 2007; Tahiroglu, Celik, Uzel, Ozcan, & Avci, 2008) or health activities across all ages (Atkinson, Saperstein, & Pleis, 2009). Little is known about the Chinese STBA adults' preference for searching health information via the Internet and the factors that influence their desire.

Soon-to-be-aged (STBA) adults who are aged 50 to 64 years old are in their transition from employment to retirement, and from being relatively healthy to facing inevitable age-related changes. In November 2009, US health authorities (Centers for Disease Prevention and Control (CDC), American Association of Retired Persons (AARP) and American Medical Association) highlighted the importance of promoting health concepts and educating this age group about preventive strategies, because they account for about 20% of the US population (Centres for Disease Control and Prevention, 2009). It was asserted that if this group of people does not do well in disease prevention or chronic illness care, they may place a heavy load on the health care system (Centres for Disease Control and Prevention, 2009). The same may be true in many other countries, where about one fifth of the population is STBA adults. These include Australia (19%), Japan (21%), New Zealand (18%), Republic of Korea (18%), Singapore (23%), and the two SARs of China, Macau SAR (23%) and Hong Kong SAR (22%) (World Health Organization, 2010). Thus, neglecting to educate this age group for health promotion and chronic illness care may increase the burden and costs of health care in these countries.

According to the Healthy Living Survey in Hong Kong, the STBA group has the highest proportion (50-60%) of people who have either not taken action or have not planned to take action to improve their health in the next 6 months (Lam, Chan, Ho, & Chan, 1999). The STBA group also has the smallest proportion (31%) of people worrying about chronic illness, the highest proportion (75%) with a current weight that is heavier than they had at age 20, and the highest daily cigarette consumption per person (Lam, Chan, Ho, & Chan, 1999). All these figures indicate that persons in the Hong Kong STBA group are vulnerable and have considerable potential to develop health problems. Thus health education is crucial to them. An online platform is one of the ways to educate this age group. In a previous study, many of the Chinese adults indicated their interest in using the Internet to learn health information as they grew older (Leung, Ko, Chan, Chi, & Chow, 2007).

Previous studies investigated the phenomenon of online health information searching and identified some predictors of such behaviour. About 73% of the respondents in Taiwan had access to the Internet and about half searched for online health information (Hsu, 2005).

Among the breast cancer patients, Internet was ranked as the second health information source eight months after the diagnosis, and then it became the most frequently cited information source sixteen months after the diagnosis (Satterlund, McCaul, & Sandgren, 2003). This indicated that patients were more willing to use Internet to get health information as time went by. On the contrary, another study found that adults who have been diagnosed with cancer were more likely to have incidental health information use from traditional media but not the Internet (Tian & Robinson, 2009). It seemed that whether illness or health status would enhance online health information searching behaviour was still controversial. High education, young age, and high socioeconomic status or household income (Pereira, Koski, Hanson, Bruera, & Mackey, 2000; Satterlund, McCaul, & Sandgren, 2003; van de Poll-Franse & van Eenbergen, 2008) were the significant predictors of Internet use. Other than these demographic factors, patients' satisfaction with the amount of treatment-related information given by caregivers also triggered individuals to look for online health information (Pereira, Koski, Hanson, Bruera, & Mackey, 2000).

The current study aims to identify factors (demographics, health-related factors and socio-cultural factors) that are associated with Chinese STBA adults' preference for online health information (POHI). We propose the following research questions:

RQ1: What are the characteristics of the STBA adults who prefer online health information?

RQ2: Which factors increase the likelihood of the preference for online health information among Chinese STBA adults?

METHODS

Design and Sampling

The current study is a secondary analysis of a 2005-2006 cross-sectional survey that aimed to identify factors affecting health-related learning behavior in Hong Kong residents, aged 45 years or older (Leung, 2007). The dataset was used for this secondary analysis to study a more specific age range; it contained a large group of Chinese STBA adults, aged 50 to 64 years, along with potential predicting factors. Convenience sampling was used for the original study; included were persons who were in the respective age range who were Chinese, Hong Kong residents, able to read Chinese, and willing to participate in the survey and sign an informed consent form. Of the original 805 (50%) questionnaires (out of 1,625) that were completed and returned, 516 who were aged between 50 and 64 were selected and included in the secondary analysis.

Measures

Preference for online health information.

Respondents' preference for online health information was measured by their responses to a question "Which form of health information would you prefer?" with eight options including health information on the Internet, lectures/talks by health professionals, television, newspaper, radio, individual counseling by health professionals, self-learning materials, and recommendations from relatives/friends. These options were decided on by reviewing the findings of the qualitative study conducted by the investigator (Leung, Ko, Chan, Chi, & Chow, 2007; Leung, Lui, & Chi, 2005a; Leung, Lui, & Chi, 2005b). Respondents were asked to choose from the eight pre-set options all that applied to them. We then created a dichotomous variable "preference for online health information (POHI)" based on whether or not this option was selected (1 = yes, 0 = no).

Perceived barriers and facilitators to learning health information.

Respondents were asked to choose items they perceived to be barriers and facilitators to learning health information. They were given an investigator-developed checklist of ten items with four barriers (i.e. believe the content is not worth learning about, have the basic knowledge already, have difficulty comprehending the content, and are unable to learn health information) and six facilitators (i.e. having better language ability, a companion, financial support, a positive learning atmosphere in society, a teacher who is similar in age, and someone can teach me). Respondents were asked to choose all those that applied to them (1 = yes, 0 = no). Each item was scored dichotomously; total scores were not calculated.

General self-efficacy.

Respondents' self-efficacy (the general sense of competence) was assessed by the 10-item Chinese version of the General Self-efficacy Scale (GSeS) (Zhang & Schwarzer, 1995). All items are rated on a 4-point Likert scale (1 = not at all, 4 = exactly true). Scores could range from 10 to 40. Higher scores indicated greater self-efficacy. The Chinese version of this scale demonstrated excellent internal reliability: all the inter-item correlation coefficients were 0.30 and all item-to-total correlation coefficients were 0.50 and good internal consistency (Cronbach's alpha = .90) in Chinese adults aged 18 or above (Zhang & Schwarzer, 1995). The internal consistency coefficient (Cronbach's alpha) of the GSeS in the current sample was .89.

Chinese value of learning.

The value that respondents placed on learning, in the context of Chinese society was measured by using the 5-item Chinese Value of Learning Scale (CVLS) (Leung, Chi, Chow,

& Chan, 2006). All items are rated on a 4-point Likert scale (1 = not at all, 4 = exactly true). Scores could range from 5 to 20. Higher scores indicated a greater value that the respondent placed on learning. The scale demonstrated good internal consistency and reliability: Intra-class correlation (ICC) = 0.51 (95% CI = -0.03, 0.82) over 7 days (Leung, 2007; Leung, Chi, & Chan, 2006). The factor loadings of the five items in the CVLS ranged from 0.86 to 0.92. All five items of the CVLS contributed to one principal component, which accounted for 79.80% of the total variance (Leung, 2007; Leung, Chi, & Chan, 2006). The internal consistency coefficient (Cronbach's alpha) in the CVLS in the sample aged 45 to 64 was .93.

Health-related factors.

Four items are included: self-rated health, physical exercise, smoking, and drinking. Self-rated health was a one-item question asking "In the last 3 months, how would you describe your health status?" It was measured with a 5-point Likert scale (1 = very good, 2 = good, 3 = fair, 4 = bad, 5 = very bad). Lower scores indicated better perceived health status. Physical exercise was measured as whether or not they participated in sports or exercises for at least 30 minutes per session for three times a week in the previous 30 days (1 = yes, 0 = no). Smoking was asked by a question "In the previous 30 days, how many cigarettes did you smoke per day?" This variable was then recoded as a dummy variable "smoking" (1 = yes, 0 = no). Drinking was measured by a question "How often do you drink alcohol beverage (drink at least one can/bottle of beer, 1 glass of wine or 1 measure (peg) of spirits)?" Six options were given: 1) I don't drink any alcohol beverage; 2) I drink daily (at least 1 glass / can per day); 3) 1 drink 4-6 days per week, 4) I drink 1-3 days per week; 5) I drink 1-3 days per month; 6) I drink less than once per month. This variable was then recoded as "drinking". Answers to the option 1, 5 and 6 were grouped and recoded as "0 = no, I don't have such habit", while the rest of the responds were recoded as "1 = yes, I have such habit".

Demographic factors.

The following demographic characteristics of respondents were measured on the survey form: age, gender, educational level, employment status, marital status, and monthly household income.

Procedure

Ethical approval of the study was obtained from the Institutional Review Board of the University of Hong Kong. The investigator asked 28 non-government agencies to assist by inviting their members to participate in the survey. The investigator and a research assistant went to the centers or attended meetings of each agency and asked members who were there

if they would be willing to take the survey. Those who agreed, then provided informed written consent and filled out the questionnaire. Some questionnaires were returned at the time of the survey and some were returned to the in-charge person of the agency. Participation in the survey was completely voluntary and there was no linkage to any of the services provided by the agencies. Details of the procedure were reported elsewhere (Leung & Leung, 2010). For the secondary analysis, only those aged 50 to 64 were selected for analysis.

Data analysis

Bivariate and multivariate analyses were used to identify factors associated with POHI. In the bivariate analyses, t-tests were used to compare continuous variables while chi-square tests were used for categorical variables. Factors tested were demographic characteristics, health-related factors, barriers and facilitators to online health information seeking, self-efficacy and Chinese value of learning. All factors that were significantly associated with POHI in the bivariate analyses were included in the multivariate logistic regression model; determinants of POHI were identified using a backward elimination method with likelihood ratio tests. To check the correlations among the independent variables in the logistic regression model, multicollinearity diagnosis was conducted on the independent variables that were significant. The variance inflation factor (VIF) was used to quantify the severity of the multicollinearity (Lohninger, 2010). We reported adjusted odds ratios (adj. OR) with 95% confidence intervals (CI). The alpha was set at 0.05.

RESULTS

Nearly all of the soon-to-be-aged respondents (513/516) selected more than one modality for learning health information, while three others selected only one method. One third selected "learning health information from the Internet" as one of their choices. It ranked fifth among the other forms of information-seeking (Table 1). Three methods were selected by over half of the respondents: "learning from lectures/talks offered by health professionals," "via TV," or "newspapers". Learning information from the radio was selected by nearly half of the respondents, while individual counseling offered by health professionals was chosen by only one-third.

The majority of the respondents were between the ages of 50 and 54, female, had a 10^{th} grade education or above, were not employed, were married or cohabiting, had a monthly income from $10,000 to above $30,000 HKD, rated their heath as fair to good, exercised, and did not smoke or drink. The characteristics of the 154 respondents who chose online health information (Research Question #1) were similar to those who did not choose online health information, except that there were more in the younger STBA age group,

Table 1. Chinese soon-to-be-aged adults' preferred forms of health information learning

Learn health information via...	Frequency	Percentage
Lecture/talks by health professionals	323	62.6%
Television	310	60.1%
Newspaper	304	58.9%
Radio	246	47.7%
Individual counseling by health professionals	180	34.9%
The Internet	154	29.8%
Self-learning materials	142	27.5%
Recommendation from relatives/friends	131	25.4%

(aged 50 to 54 years), the educated group (grade 10 or above), the being employed group, the married or cohabiting group, the higher household income group and the physical exercise active group (Table 2). There were significant bivariate relationships between POHI and the demographic factors of age (p = .01), educational level (p < .001), employment status (p = .002), marital status (p = .03), and monthly household income (p = .02), but not gender. The only health-related factor that was associated with POHI was physical exercise (p = .045). There were no significant associations between POHI and health-related factors of self-rated health, smoking, and drinking (p > .05) (Table 2).

The most frequently chosen barrier to learning was that many respondents said they "had already had a basic knowledge of health information" while fewer said they "had difficulty comprehending the content" or "felt they were unable to learn," these two barriers were significantly negatively associated with POHI. The most frequently chosen facilitator to learning was the perception that "someone could teach them," and more than half chose it. Another facilitator"having good language ability" was significantly positively associated with POHI (Table 3).

Finally, using t-tests, those who chose learning about health on the Internet had significantly higher scores on the Chinese value of learning scale, compared to those who did not choose Internet learning (M [SD]: 23.10 [2.80] vs 22.2 [2.61], p = .001).

To answer Research Question #2, multivariate logistic regression analysis indicated that five of the ten factors were found to be the predictors of POHI: 10th grade education or above, OR = 1.90, 95% CI = 1.17, 3.08, being employed, OR = 1.67, 95% CI = 1.06, 2.63, perceiving they had good language ability, OR = 2.35, 95% CI = 1.53, 3.62, knowing someone who could teach them, OR = 1.81, 95% CI = 1.18, 2.76, and Chinese who placed a higher value on learning (higher Chinese value of learning [CVLS]), OR = 1.13 , 95% CI = 1.04, 1.23 (Table 4). Those with Grade 10 or above education were almost twice as likely as their counterparts with lower education level to search for online health information. Those who were being employed were also more likely to look for health information than the unemployed, the retired or the housewives. Respondents who perceived that they had

Table 2. Demographic factors, health-related factors and their relationships with preference for online health information (POHI) among Chinese soon-to-be-aged adults (N = 516)

	Total Sample (N=516)	Prefer online health information (n = 154)	Not prefer online health information (n = 362)	
	N	n (%)	n (%)	*p*
Age (in years)				.01*
50 – 54	201	71(46)	130 (36)	
55 – 59	188	58 (38)	130 (36)	
60 – 64	127	25 (16)	102 (28)	
Gender				.65
Male	133	42 (27)	91 (25)	
Female	380	112 (73)	268 (75)	
Education level				<.001***
Below grade 10	180	32 (21)	148 (41)	
Grade 10 or above	334	121 (79)	213 (59)	
Employment status				.002**
Being employed (full/part time)	134	54 (37)	80 (23)	
Retired/housewife/unemployed	356	93 (63)	263 (74)	
Marital Status				.03*
Single/divorce/widow	111	24 (16)	87 (24)	
Married/cohabit	403	129 (84)	274 (76)	
Monthly household income (HKD)				.02*
No income	48	10 (7)	38 (12)	
≤$5,999	35	7 (5)	28 (8)	
$6000 - $9,999	51	15 (10)	36 (11)	
$10,000 - $19,999	108	28 (20)	80 (25)	
$20,000 - $29,999	61	16 (11)	45 (14)	
≥ $30,000	163	67 (47)	96 (30)	
Self-rated health				.23
Very good	45	19 (12)	26 (7)	
Good	195	60 (39)	135 (38)	
Fair	225	64 (42)	161 (45)	
Bad	43	11 (7)	32 (9)	
Very bad	4	0 (0)	4 (1)	
Physical exercises				.045*
Yes	337	111 (73)	226 (64)	
No	169	41 (27)	128 (36)	
Smoking				.37
Yes	19	4 (3)	15 (4)	
No	483	148 (97)	335 (96)	
Drinking				.11
Yes	153	54 (35)	99 (28)	
No	352	99 (65)	253 (72)	

Note: * =$p < .05$, ** =$p < .01$, *** =$p < .001$

Table 3. The relationships between the barriers / facilitators to learning and preferencefor online health information (POHI) among soon-to-be aged adults

		Total Sample (N=516)	Prefer online health information (n = 154)	Not prefer online health information (n = 362)	
		N	n (%)	n (%)	*p*
Barriers to learning					
	Not worth making the effort to learn	34	10 (6)	24 (6)	.95
	I have had basic knowledge already	226	74 (48)	152 (42)	.21
	Difficult to comprehend the content	92	18 (12)	74 (21)	.02*
	I am not able to learn	76	11 (7)	65 (18)	.001**
Facilitators to learning					
	I think I have good language ability	152	65 (42)	87 (24)	<.001***
	I wish I could have some companion	162	48 (31)	114 (31)	.94
	I wish I have financial support	208	70 (45)	138 (38)	.12
	There is positive learning atmosphere in society	151	53 (34)	98 (27)	.009
	Someone who is in my age group can be my teacher	66	22 (14)	46 (13)	.63
	Someone can teach me	282	102 (66)	180 (50)	.001**

Note: * =$p < .05$, ** =$p < .01$, *** =$p < .001$

good language ability were more likely to search for online health information than their counterparts. Availability of someone who could teach the STBA adults also increased the likelihood of online health information preference. Finally, those who valued ongoing learning in older age were more likely to browse the Internet and look for health information than those who did not. The VIF of these five predictors were all smaller than 1.1 which indicated that there was no multicollinearity among the predictors (Lohninger, 2010).

Discussion

We found that about 30% of the Chinese soon-to-be aged adults in Hong Kong would like to look for health information on the Internet. This was the first survey that assessed the health-related online behavior in Hong Kong. The few published population surveys studied use of the Internet in general, such as communicating through emails, browsing government websites and reading newspapers (Census and Statistics Department, 2009). No previous study investigated health-related behavior in relation to use of the Internet. However,

Table 4. Multivariate logistic regression of preference for online health information (POHI) among Chinese soon-to-be-aged adults

Predictors to POHI	Adjusted Odds Ratios	95% Confidence Interval	*p*
Education level: Grade 10 or above	1.90	1.17 - 3.08	.009**
Employment status (Being employed)	1.67	1.06 - 2.63	.03*
Have good language ability (Yes)	2.35	1.53 - 3.62	< .001***
Someone can teach me	1.81	1.18 - 2.76	.007**
Greater Chinese value of learning (per score)	1.13	1.04 - 1.23	.004**

Note: * = $p < .05$, ** = $p < .01$, *** = $p < .001$

preferring to use the Internet to search for health information among soon-to-be-aged adults in Hong Kong society is relatively low, compared to other countries or regions such as Canada (58%), Taiwan (52%), and the US (40%) (Baker, Wagner, Singer, & Bundorf, 2003; Ernerst & Shanthim 2004; Hsu, 2005)

The characteristics of Chinese Internet users who would like to use online health information that those who were younger, married, being employed, better educated, and who had a higher monthly household income were more likely to look for online health information than their counterparts. These findings were consistent with findings of previous studies in Caucasian populations (Pereira, Koski, Hanson, Bruera, & Mackey, 2000; van de Poll-Franse & van Eenbergen, 2008). Chances of using online health information among the more educated STBA adults was almost double that of their counterparts. Previous studies also found that the higher educated breast cancer patients were significantly more likely to use cancer-related online health information than the less-educated patients (Pereira, Koski, Hanson, Bruera, & Mackey, 2000; van de Poll-Franse & van Eenbergen, 2008). However, the current study extended our understanding of the relationship between educational level and use of the Internet by also surveying individuals' views on their own language ability. We found that one's perception of better language ability doubled the likelihood of using the Internet to search for health information, compared to those who did not think they had good language skills. Perceived language ability was not necessarily equal to educational level, which was supported by the lack of multicollinearity in this study. For example, adult cancer patients admitted that their language skills such as spelling and writing were learned informally, across different situations in everyday lives (Taylor, 2006). Reading newspapers, listening to radio and watching films are good examples of these situations (Taylor, 2006). If television and radio are used to learn, adults tend to observe first and then practice their language skills (Taylor, 2006). Some adults said that they used a discovery approach to informally improve their language skills, that is, "trying to figure something out by not getting it right by the first time" (Taylor, 2006). Thus, through day-to-day practice and informal learning, adults

improve their literacy, beyond that of their educational level (Taylor, 2006). To encourage more STBA adults to use the Internet to look for health information, it may be worthwhile to help them develop their language abilities through informal learning. The government should provide sufficient facilities, such as libraries and educational television programs, to improve individuals' language skills in adulthood. Health educators could take the lead and run workshops in public libraries to educate citizens how to access quality health websites (Oermann, Lesley, & VanderWall, 2005). With better language skills, one may be more willing to access online health information.

Employment status and monthly household income were initially found to be associated with preference for online health information. However, the relationship between monthly household income and POHI diminished in the regression model. Thus, household income was not a strong indicator for preference for online health information among soon-to-be-aged adults. This may be because using the Internet to search for health information in Hong Kong is not a costly activity. Many public facilities such as public libraries and Mass Transit Railway stations provide free access to the Internet to the citizens in Hong Kong. Financial constraints do not seem to hinder the use of the Internet to search for online health information in Hong Kong, for those who really have the intention to do so. On the contrary, employment status remained as one of the significant factors associated with the preference of online health information. Being actively employed was related to greater preference for using the Internet for health information, probably because Internet skills are often learned and maintained on the job.

Self-rated health and health behaviors (doing regular physical exercises, avoid smoking and drinking) were also not good predictors of preference for online health information. This indicated that STBA adults with a poor perception of their existing health status, or those who were sedentary, or who smoked or drank alcohol did not prefer online health information, compared to their healthier counterparts. Their behaviors differed from those of persons whose online health information searches may have been triggered by a diagnosis and their interest in looking for alternative therapies (Pew Internet and American Life Project, 2000).

The findings also contributed to the identification of cultural factors in relation to health-related online behavior. The availability of teachers and the value of learning in Chinese society were the two significant predictors of the preference for health-related online behavior among STBA adults. In the Chinese culture, teachers are considered as authoritative figures and are highly respected by students. Chinese adults are inclined to ask for someone who can teach them to use new technology. This echoes the findings of a previous study in which Chinese older adults reported that they gained more confidence in looking for health information on their own, after attending a geragogy-based (that is, the method was tailor-made to meet the learning needs of older adults) workshop on web-navigation (Leung, Ko, Chan, Chi, & Chow, 2007). In the workshop, a nursing faculty

member and six nursing students guided the respondents to browse several reliable health websites and then get answers to their health questions (Leung, Ko, Chan, Chi, & Chow, 2007). Although STBA adults expected to have someone to guide them in Internet use, they did not think having teachers of a similar age (that is, middle-aged or older) was essential. Thus people from different age groups should be encouraged to teach STBA adults how to make good use of the health websites and get health information. In the recent years, under the Elder Academy Scheme, many schools have organized computer workshops for STBA adults/elders and have trained primary and secondary students to be the tutors (Elderly Commission, 2009). Such intergenerational workshops provide a pool of teachers to assist STBA adults in Internet learning.

The Chinese value of learning was another significant factor associated with the chance of POHI among STBA adults. This construct, which is closely related to the concept of lifelong learning, is that learning should be extended to old age, and efforts should be made to overcome barriers in learning. This belief is deeply embedded in the heart of many Chinese people. Confucius espoused a lifelong learning approach and the concept was reflected by his aphorisms. For example, "Grant me a few more years so that I can continue to learn at the age of fifty, and I shall be, perhaps, may be free from major errors" (Lau, 1992). Confucius' aphorisms were usually short statements and are well recognized by the Chinese. Individuals with a higher level of the Chinese value of learning were more likely to search for health information from the websites than their counterparts. This may partly be due to notions that searching health information from the Internet is not an easy task. Use of the Internet could be hindered by navigational challenges due to disorganization of the contents in the websites, use of technical language, and periodical changes in the features of the websites (Cline & Haynes, 2001). STBA adults acknowledge the difficulties in comprehending the content of the health websites, and perhaps this is one of the reasons why they would enjoy having someone to guide them in the Internet search. In addition, when STBA adults read the health information on the Internet, they need to execute comprehensive ability and numerical skills to understand what was written in the health websites. Someone who had a low level of health literacy would find it difficult to understand and comprehend the health information from the Internet and then apply the knowledge in daily life (United States Department of Health and Human Services, 2010).

The current study found that general self-efficacy was not a significant factor related to the preference of online health information. Greater self-efficacy was not associated with preferring to search for health information in the Internet. This finding may suggest that individuals having the confidence to solve general problems in daily lives do not necessarily have the confidence to deal with the problems in the Internet world. Internet search may demand more specific skills and thus building up STBA adults' Internet self-efficacy would be essential (Eastin & LaRose, 2000).

Limitations

The current study was a secondary analysis of a survey and there were a number of limitations. First, findings are limited to Chinese soon-to-be-aged adults in Hong Kong and cannot be generalized to other cultures, age groups or locations. Second, the instrument used to measure the barriers and facilitators to health-related learning was not specific to online health information preference. Third, the respondents were asked to indicate their interest in using the Internet to search for health information, among other ways of learning. The current findings do not represent the actual behavior of the soon-to-be-aged adults in Internet application. Therefore, the findings should be interpreted with caution.

Conclusion

This study contributed to better understanding of STBA adults' preferred kinds of health information, in particularly, their preference for online health information. Although online health information was ranked fifth among other kinds of information, nearly one-third would like to get health information from the Internet. This indicates online health information plays a significant role in health promotion in this age group. The current study identified two socio-cultural factors (the availability of teachers and the Chinese value of learning) that could increase the likelihood of STBA adults to access online health information. This group of adults would like someone to be present to teach them ways of obtaining health information from the Internet. Individuals who value the notion of lifelong learning are more likely to use online health information.

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THE INFLUENCE OF HEALTH NEWS EXEMPLARS ON COLLEGE STUDENTS' OPTIMISTIC BIAS OF BREAST CANCER RISK PERCEPTION AND BEHAVIORAL INTENTION TO ENGAGE IN PREVENTIVE BEHAVIORS

YANGSUN HONG, DOOHWANG LEE AND HONG-SIK YU

The current study tested the effects of exemplars on college students' optimistic bias of breast cancer risk perception and their behavioral intentions to engage in preventive behavior. Using a sample of Korean female college students, this study conducted two experiments. The findings suggest that threatening pictorial exemplars of breast cancer patients can be effective in boosting individuals' perception of self-vulnerability to breast cancer, which, in turn, motivates individuals' intentions to adopt recommended precautionary behaviors. Furthermore, adoption of such preventive behaviors is likely to be promoted by increasing one's perception of self-vulnerability to the disease rather than by decreasing one's self-serving bias of optimism.

Keywords: exemplification theory, exemplar, health campaign, breast cancer

Breast cancer is one of the most rapidly growing causes of cancer death for women in many countries. Indeed, breast cancer is the second most commonly occurring cancer and

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the second leading cause of cancer death in the United States (American Cancer Society [ACS], 2011). While the highest rate of occurrence is with women in their sixties, the age of patients is constantly decreasing from women in their fifties to thirties. In fact, breast cancer has the highest rate of occurrence among cancer diseases in women under 39 years old in the U.S. (American Cancer Society, 2009) and the second most commonly diagnosed cancer in women under 35 years old in the UK (Cancer Research UK, 2011). Notably, in South Korea, breast cancer is also ranked as a top occurring cancer for women and the age of breast cancer patients are constantly decreased in their twenties or thirties (Korean Breast Cancer Society, 2008). For example, in the case of South Korea, women in their 30s and 40s are those with the highest rate of breast cancer occurrence. About 20 percent of breast cancer patients are under 39 years old, and the number of breast cancer patients under 39 years old is 3 times more than in the US and UK (Korea Breast Cancer Society, 2008).

Compared to other types of cancer diseases, breast cancer is hard to prevent before it occurs, and so early detection is the most important way to decrease morbidity and mortality (National Cancer Institute, 2007). Detecting tumors in their early stages gives patients an over 95 percent chance of surviving breast cancer. Therefore, breast cancer campaigns have emphasized the importance of performing detective behaviors such as breast self-examination and breast screenings on a regular basis. These previous campaigns have focused on over-middle-aged women as a target population. Although a few cases of breast cancer occur in women in their early 20s, however, breast cancer campaigns should also strongly recommend young females to perform regular breast self-examinations and to have professional screenings if they find anything suspicious (Jeong, 2011).

Yet, young females are less likely to engage in detective behaviors due to several reasons. Among barriers to block performing detective behaviors for young females, scholars have focused on unrealistic optimism of risk perception, an individual's tendency to perceive that they are less vulnerable to negative events and more likely to experience positive events than their peers (Schwarzer, 1994; Weinstein, 1989). This self-serving discrepancy between self- and others-vulnerability to health risks may lead to harmful consequences to individuals' health because their internal optimistic misjudgment of self-vulnerability may cause them to disregard preventive behaviors (Dillard, McCaul, & Klein, 2006; Weinstein & Klein, 1995). For instance, a young female who perceives breast cancer as only occurring for women over 40 may judge that her risk of developing breast cancer is lower than women older than her. It is a quite reasonable judgment. But optimistic bias represents the phenomenon that she may judge that her risk of breast cancer is also lower than other women the same age. Because of this optimistic bias of risk perception, people are less likely to engage in detective or preventive behaviors against health risks.

Scholars have argued that reducing optimistic bias of risk perception is pivotal for motivating people to engage in preventive behaviors by suggesting possible moderating effects of message intervention to decrease such self-serving bias (e.g., Rimal & Morrison,

2006). However, little research has examined the potential roles of specific exemplars adopted in health messages, including patient's interviews and threatening pictures, in moderating an individual's optimistic bias of risk perception in a controlled experimental setting.

Thus, the current study is designed to explore the possible role of exemplars in influencing individuals' optimistic bias and intention to engage in detective behaviors. By investigating the effects of exemplars in health messages about breast cancer, this study will highlight the important role of exemplars, which are frequently used in health intervention messages, in motivating self-protection behaviors. The results of this study will guide the future development of persuasive message campaigns and practices to address the risk of breast cancer, particularly among young females.

Optimistic Bias in Health Risk Perception

Originally introduced by Weinstein (1980), optimistic bias refers to the tendency to perceive that one is less vulnerable to negative events than others and more likely to experience positive events. Optimistic bias has been regarded as conceptually synonymous with several concepts in the literature of social comparison, including unrealistic optimism (Dillard et al., 2006), self-positive bias (Menon, Block, & Ramanathan, 2002), perceived invulnerability (Gouveia & Clarke, 2001), positive illusion (Taylor & Gollwitzer, 1995), illusory superiority (Buunk & Van Yperen, 1991), and illusory self-assessments (McKenna & Myers, 1997). All of these concepts point to individuals' cognitive bias of risk perception that causes them to overestimate the likelihood of experiencing positive events or underestimate the likelihood of experiencing negative events.

Numerous studies have offered strong evidence of optimistic bias across a wide range of health-related risks, including AIDS (Ellen, Boyer, Tschann, & Shafer, 1996; Harris & Middleton, 1994), sexually transmitted disease (Chapin, 2000; Whaley, 2000), diabetes (Hevey, French, Marteau, & Sutton, 2009), unexpected pregnancy (Eldridge, Lawrence, Little, Shelby & Brasfield, 1995; Smith, Gerrard, & Gibbons, 1997), heart attack (Radcliffe & Klein, 2002), alcoholism (Dillard, Midboe, & Klein, 2009), smoking (Dillard et al., 2006), skin cancer (Clarke, Williams, & Arthey, 1997), breast cancer (Katapodi, Dodd, Facione, Humphreys, & Lee, 2010), lung cancer (Strecher, Kreuter, & Kobrin, 1995), general health risk (Glanz & Yang, 1996; Hoorens, 1996), health risk of environmental pollution (Pahl, Harris, Todd, & Rutter, 2005), and so forth. These studies provided clear evidence of optimistic bias of health-related risks as participants estimated that they were less vulnerable to the given health risks and that others were more vulnerable regardless of the sample distribution and the type of diseases.

Researchers have suggested that such optimistic bias is primarily motivated and formed by individuals' social need for ego enhancement (Klein & Cooper, 2007; Weinstein

& Klein, 1996). That is, people tend to engage in downward social comparisons and perceive themselves as superior to others because the self-serving bias is likely to lead them to have a positive mood and feeling of self-worth (Wills, 1981). By overestimating their capabilities to manage certain risk situations, individuals are motivated to reinforce an optimal level of self-esteem. In this sense, it is often assumed that the self-serving bias provides a sense of safety, promoting both mental and physical well-being (Block & Colvin, 1994; Perloff, 1987; Taylor & Brown, 1988).

However, other researchers have asserted that optimistic bias may act as a barrier to block effective health communication strategies (Dillard et al., 2006; Radcliffe & Klein, 2002; Taylor et al., 1992). That is, optimistic bias may produce harmful outcomes because the self-serving bias may deter individuals from taking appropriate preventive behaviors against risks. For example, if women have an optimistic bias about breast cancer, they tend to underestimate their likelihood of getting breast cancer and are therefore less likely to engage in such precautionary behaviors as breast self examination and regular breast screening.

In fact, optimistic bias has been found to decrease individuals' attention to risk information (Radcliffe & Klein, 2002; Wiebe & Black, 1997), concerns about risk behaviors (Radcliffe & Klein, 2002), and behavioral intentions to engage in preventive behaviors (Dillard et al., 2006; Taylor et al., 1992). For example, Taylor and colleagues (1992) found that gay men who have unrealistic optimism about their risk of AIDS were less likely to engage in preventive behaviors than those who were accurately aware of their risk. Similarly, Dillard and colleagues (2006) demonstrated that smokers who were unrealistic optimists were more likely than those who were realistic respondents to endorse beliefs that getting lung cancer depends on genetics and a greater number of lung cancer patients can be cured. Further, those smokers having unrealistic optimism were found to be less likely to plan on quitting smoking. These findings suggest that those who have a high level of optimistic bias may have less intention to engage in preventive behaviors because their optimistic bias may lessen their levels of perceived risks and lead them to believe that the negative health outcomes would not happen to themselves. Unless such optimistic bias is reduced, health campaigns to convince people to adopt preventive behaviors are less likely to be successful.

However, little research has attempted to examine if health messages are effective in reducing individuals' optimistic bias of risk perception and increasing their intention to perform preventive behaviors in experimental settings (Harris, Middleton, & Joiner, 2000). Similarly, Dillard and colleagues (2009) pointed out that most of the literature on optimistic bias has largely relied on non-experimental research. Indeed, only a handful of experimental attempts have been made to investigate the role of potential moderators on the optimistic bias in health context (Harris et al., 2000; McKenna & Myers, 1997; Rimal & Morrison, 2006; Stapel & Velthuijsen, 1996; Taylor & Gollwitzer, 1995; Weinstein, 1983). From this

perspective, the present study introduces specific exemplars adopted in health messages as a persuasive strategy and investigates their potential roles in moderating the degree of individuals' optimistic bias of risk perception and increasing their intentions to perform preventive behaviors in the context of a health news message.

EXEMPLIFICATION THEORY

One of the most common and effective types of health campaigns utilizes persuasive message strategies with specific types of exemplars to maximize knowledge about health risks so that individuals can accurately judge their own risks and evaluate possible consequences associated with the risks (Zillmann, 2006). Through the psychological processes involving either textual or visual exemplars, individuals become motivated to adopt the preventive behaviors. In this sense, utilizing appropriate "exemplars" in persuasive messages may be one of the most effective health campaign strategies to reduce the degree of optimistic bias of risk perception. Specifically, using real case exemplars such as patients' interviews and threatening pictures with health-related information should be regarded as one of the effective persuasive message strategies for health communication.

One promising theoretical framework for understanding the uses and effects of the exemplars is the exemplification theory (Zillmann & Brosius, 2000; Zillmann, 2006). This theory assumes that people tend to pay more attention to vivid exemplars than non-vivid exemplars and base-rate information. And they are more likely to be influenced by the vivid exemplars than non-vivid exemplars and base-rate information, including disease incident rate and death rate. Zillmann and Brosius (2000) suggest that this is largely due to the heuristic processes, the "psychological mechanisms that simplify and expedite information intake and utilization" (p. 39). That is, when people are faced with new information, they tend to use heuristic processes as cognitive shortcuts for making quick and simple judgments about the information. This assumption is related to individuals' heuristic tendency to judge an object based on their perception of the degree of similarity of its attributes with those of other objects (representativeness heuristic) and only available information on the object (availability heuristic).

The authors argue that individuals become more attentive to the issues raised in the messages and tend to evaluate the issues primarily based on how the exemplars are featured. Consequently, exemplars can accurately reflect the population parameter, such as viewers' beliefs or judgments about the topic at hand (Zillmann & Broisus, 2000). In the same context, a number of health-related studies demonstrated that individuals' assessments of risks were biased by such heuristic tendency. For example, Stapel and Velthuijsen (1996) found that when people are exposed to exemplars in a health message that are similar to themselves they tend to internalize the exemplar event and perceive that it is likely to happen to them.

Based on the psychological mechanisms of exemplar-processing, previous studies have tested the potential positive effects of exemplars with demographic similarity on individuals' perception of issues (Andsager, Bemker, Choi, & Towel, 2006; Brosius, 1999; Brosius & Bathelt, 1994; Knobloch-Westerwick & Hastall, 2006). For example, Brosius (1999) tested how the degree of demographic similarity between participants and exemplars would influence perceived salience of an issue by manipulating the degree of similarity of the exemplars' demographic information, such as students versus pensioners. However, the similar exemplars were found to have no effect on participants' judgments about the issues in the study. Similarly, Brosius and Bathelt (1994) conducted a similar experiment but also failed to show that the similar exemplars were effective in increasing people's perception about the issue presented. In the study, they noted that the stimuli used in the study might have generated no significant effect of exemplars on issue perception because the stimuli might not have been directly related to the demographic difference between the participants and the exemplars.

In a context of an anti-alcohol message campaign, Andsager et al. (2006) tested the same hypothesis by manipulating the exemplars into two conditions. One condition was an exemplar featured an interview with a college student and the other condition had no interview in the message. They found that perceived similar exemplar was positively related to message effectiveness operationally defined with credibility, relevance, and usefulness of the information in the article; that is, participants who were exposed to the similar exemplar were more likely to perceive the news credible, relevant, and useful than those who were exposed to the news article with no similar exemplar. In a similar fashion, Knobloch-Westerwick and Hastall (2006) found that individuals, especially young people, had a tendency to prefer news articles containing more similar exemplars in their demographic information than those articles containing less similar exemplars. The findings of these studies suggest that similar exemplars in social demographic information tend to increase individuals' attention to issues in news articles.

STUDY 1

Study 1 assumes self-relevant exemplars as a persuasive communication strategy and attempts to uncover a role of the self-relevant exemplar in affecting individuals' optimistic bias of risk perception and intentions to perform precautionary behaviors. Specifically, we expect that self-relevant exemplars in age will reduce women's self-serving bias of risk perception to breast cancer and increase their intentions to engage in precautionary behaviors particularly when they are exposed to breast cancer news articles.

In fact, women have been found to have a salient degree of optimistic bias about breast cancer, especially when they are asked to compare their own risk of having breast cancer to the risk of their friends and peers or that of an average, same-aged woman (Absetz,

Aro, Rehnberg, & Sutton, 2000; Clarke, Lovegrove, Williams, & Machperson, 2000; Facione, 2002; Katapodi, et al., 2010; Katapodi, Dodd, Lee, & Facione, 2009; McDonald, Thorne, Pearson, & Adams-Campbell, 1999; Welkenhuysen, Evers-Kiebooms, & Decruyenaere, 2001). For example, Katapodi et al., (2009) found that most women between the ages of thirty to eighty-five believed that they were not likely to get breast cancer in their lifetime and that their risk for having breast cancer was lower than that of average, same-aged women. Similarly, Clarke et al. (2000) found that women who detected breast cancer earlier than others were likely to survive and be cured from breast cancer. Welkenhuysen et al. (2001) also found that women had the same significant self-serving bias because they perceived their risk of having breast cancer as lower than that of their peer.

However, the optimistic bias was reduced among women who have breast cancer patients in their family and relatives. Such optimistic bias may be reduced when individuals perceive their risks in relation to similar others in social demographic information, such as age, gender, social status, etc. For example, Weinstein (1989) found that when people indirectly experienced similar others' vulnerability to a certain risk, they were not likely to make downward comparisons so that they would not maintain biased self-protective optimism. Similarly, Stapel and Velthuijisen (1996) found that a news article about patients who are similar in social status increased individuals' perception on both self- and other-vulnerability, decreasing their optimistic bias of health risk. Harrison and colleagues (2000) also found that promoting similarity with socially close others, compared to socially distant and abstract targets, would increase one's vulnerability of negative events so that it would decrease optimistic bias. These findings suggest that compared to less similar exemplars in demographics including gender, age, and social status, highly similar exemplars are more likely to increase individuals' perception on their own vulnerability to risk to the degree to which they can decrease their optimistic bias. Consequently, such reduced optimistic bias will increase individuals' intentions to engage in recommended preventive behaviors.

This idea that self-relevant exemplars influence one's perception of optimistic bias and behavioral intention may parallel Turner's (1987) self-categorization theory. The theory suggests that an event related to an out-group may fail to evoke a perception of likelihood of experiencing the event for in-group because people feel the difference between self and others. Conversely, if an in-group is affected by the event, people are more likely to perceive that the event can happen to them. From this perspective, the present study assumes that people may increase perception of self-vulnerability and decrease optimistic bias when they are exposed to similar exemplars in a health message and adopt the recommended prevention behaviors. In this sense, the level of similarity in demographic information may play a role in moderating optimistic bias in the context of health messages.

Based on this reasoning, this study expects that when women are exposed to news articles containing self-relevant exemplars in age, they are more likely to feel vulnerable to the potential risks than when they are exposed to either mixed or low relevant exemplars in

age. In this process, it is also expected that their optimistic bias is more likely to be reduced and their intention to perform precautionary behaviors is more likely to be increased. Thus, this study formally states the following hypotheses:

H1: Optimistic bias of breast cancer risk perception will decrease when women are exposed to exemplars of breast cancer patients with similar age in a news article.

H2. Intention to engage in breast cancer prevention behaviors will increase when women are exposed to exemplars of breast cancer patients with similar age in a news article.

STUDY 1 METHOD

Participants and procedure

Ninety-seven female college students were recruited from undergraduate communication classes at a large university in South Korea. Male students were excluded because young women's breast cancer disease is not relevant to them. The participants' mean age was 20.57 (SD = 1.59). All participants were randomly assigned to the three conditions of age similarity exemplars: (a) high age similarity condition (n = 33), (b) low age similarity condition (n = 34), and (c) mixed age similarity condition (n = 30).

The Study 1 experiment was conducted in a classroom setting. Participants were told to read and evaluate news articles in a news magazine. Specifically, the participants were offered a fictitious news magazine containing three news articles: (a) economic news, (b) health news, and (c) culture and art news. The participants were also instructed to fill out survey questionnaires after reading the articles. Once the participants completed the questionnaires, they were debriefed and dismissed.

Stimulus

All news articles utilized in this study were adapted from daily newspapers and weekly news magazines published in South Korea. In particular, the stimulus breast cancer article was revised for the three conditions of the current study. The three stimulus articles had fictitious author attributions at the end of the articles and had the same layout as would be found in a typical weekly news magazine such as *Newsweek* and *Time*. The same stimulus articles also had identical section titles, headlines, sub-headlines, three-column style, and picture at the top of the article. Specifically, the headline for the breast cancer article was "Breast cancer, pre-examination is the best prevention," and the article was displayed under the "Health & Life" section-heading on the top of the page. A sub-headline, "Breast cancer, top ranked women's cancer in the nation, rapidly increases," was placed below the headline,

along with a picture of individuals participating in the 2008 Pink Ribbon Marathon, the biggest breast cancer campaign in that year. This picture was chosen because it would make the article look natural and not affect the participants' age relevancy level. The specific information about breast cancer provided in the news article, including present breast cancer rate, advantages of early detection of breast cancer, several preventive behaviors, and breast cancer reoccurrence rate, was identical for all three condition groups. Figure 1 shows one page of the stimulus article.

For study 1, the breast cancer news article manipulated the level of age similarity of exemplars into the following three types: (a) the high age similar exemplar condition containing interviews from four breast cancer patients in their twenties, (b) the low age similar exemplar condition containing interviews from four breast cancer patients in their forties, and (c) the mixed age similar exemplar condition containing interviews from two breast cancer patients in their twenties and two breast cancer patients in their forties. All exemplars included in the news article were either direct or indirect quotations about the patients' feelings of their breast cancer, treatment procedures, surgery results, and present medical conditions. The stimulus exemplars were collected and revised from real breast cancer survivors' stories in news stories. The stimulus exemplars also indicated interviewees' fictitious names, ages ranging from 20 to 25 or from 50 to 55 years old, and social status such as "college student" or "housewife" based on the different exemplar conditions. The appropriate exemplar was placed in the same part of the article. The total numbers of words used was about 800 words across the articles of the three conditions.

Measures

Perceived risk on self and others. Participants were asked to indicate the likelihood of having breast cancer in the near future on a 7-point scale from 0 (very unlikely) to 6 (very likely) with reference to themselves (M = 3.00, SD = .97) and others of their same age and gender (M = 3.26, SD = 1.01).

Optimistic bias. Differences in scores between perceived risk of self having breast cancer and others were calculated to measure participants' optimistic bias (M = .26, SD = 1.12).

Intention to engage in preventive behaviors. Participants were also asked to rate whether they agreed that they would adopt preventive behaviors against the risk of breast cancer in the near future on a 7-point scale from 0 (strongly disagree) and 6 (strongly agree) (M = 4.71, SD = 1.11).

Study 1 Results and Discussion

A one-way analysis of variance (ANOVA) revealed no statistically significant main effect of age similar exemplar on self-vulnerability to breast cancer, $F(2, 94) = 2.97$, $p > 0.10$, but did reveal a statistically significant main effect of age similar exemplar on other-vulnerability to breast cancer, $F(2, 94) = 8.51$, $p < 0.01$, $h^2 = .15$. A follow-up post hoc analysis using Tukey HSD indicated that the participants in the high age similar exemplar condition ($M = 3.79$, $SD = 1.14$, $n = 33$) were more likely to perceive that other individuals in the same age range would have a chance of getting breast cancer than those in the low age similar exemplar ($M = 2.76$, $SD = .86$, $n = 34$) and mixed age similar exemplar conditions ($M = 3.23$, $SD = 1.04$, $n = 30$). However, there was no statistically significant difference in participants' perception of other-vulnerability to breast cancer between the low age and mixed age similar exemplar conditions.

An ANOVA with optimistic bias as the dependent measure yielded a statistically significant main effect of age similar exemplar on optimistic bias to breast cancer, $F(2, 94) = 7.66$, $p < 0.01$, $h^2 = .13$. A follow-up post hoc analysis using Tukey HSD indicated that the participants in the high age similar exemplar condition ($M = .79$, $SD = 1.05$, $n=33$) perceived more optimistic bias about getting breast cancer than those in low age similar ($M = -.15$, $SD = 1.02$, $n = 34$) and mixed age exemplar conditions ($M = .13$, $SD = 1.11$, $n = 30$). However, there was no statistically significant difference in the participants' optimistically biased perception between low age exemplar condition and mixed age similar exemplar condition. Thus, H1 was rejected.

However, another ANOVA with intention to engage in preventive behavior as the dependent measure revealed no statistically significant main effect of the high age similar exemplar, $F(2, 94) = .644$, $p > 0.10$, indicating that there was no significant difference in the intention to engage in preventive behaviors between those in the three conditions. The findings offer no strong support for H2. Table 1 summarizes the results of the hypothesis testing.

In sum, study 1 tested the effects of self relevant exemplars in age on individuals' optimistic bias and the intention to engage in preventive behaviors against the potential risk of breast cancer. The results of the study found that exposure to highly similar exemplar in age was more likely to increase the participants' perceptions of others' likelihood of having breast cancer so that it was more likely to generate greater optimistic bias of the risk perception than low similar exemplars. However, the highly similar exemplar was not found to directly influence the participants' intentions to engage in preventive behaviors suggested in the news article. The results of study 1 suggest that individuals' intentions to engage in preventive behaviors may not be directly affected by their perception on other-vulnerability to the health risk or their optimistic bias of the risk perception. Rather, such intentions may be directly affected by individuals' perception of their own likelihood of having the health risk.

Table 1
Summary of Means (with standard deviation in parentheses) and F values for the Dependent Variables as a Function of Age Similarity Exemplar

Dependent Variables	Age Similarity Exemplars			*F*
	High	Low	Mixed	
Self-vulnerability	3.00 (0.87)	2.91 (1.11)	3.10 (0.92)	0.30
Others-vulnerability	3.79 (1.14)	2.76 (0.86)	3.23 (1.04)	8.51**
Optimistic bias	0.79 (1.05)	0.15 (1.02)	0.13 (1.11)	6.84*
Intentions to engage in preventive behaviors	4.88 (0.99)	4.68 (1.25)	4.57 (1.07)	0.64

Note: * $p < .05$, ** $p < .001$

STUDY 2

Study 2 employs pictorial exemplars as another persuasive communication strategy and attempts to test the role of the pictorial exemplar in affecting individuals' optimistic bias of risk perception and intentions to perform preventive behaviors. Specifically, we expect that threatening pictorial exemplars will reduce women's self-serving bias of risk perception to breast cancer and increase their intentions to engage in precautionary behaviors particularly when they are exposed to breast cancer news articles.

In fact, one line of exemplification research has been conducted to examine the positive relationship between the level of vividness of pictorial exemplars and individuals' perceptions of health risks in the context of health news messages (Aust & Zillmann, 1996; Gibson & Zillmann, 2000; Knobloch, Hastall, Zillmann, & Callison, 2003; Sargent, 2007; Zillmann & Gan, 1996; Zillmann, Knobloch, & Yu, 2001). For example, Knobloch et al (2003) tested the effect of pictorial exemplars in online news articles on selective exposure and issue perception and found that pictorial threatening exemplars in news articles generated more frequent selection of the articles and significantly increased reading times of the corresponding text compared to pictorial - innocuous exemplars or no pictorial exemplars. Zillmann and Gan (1996) found that participants who were exposed to a news article with more a threatening pictorial exemplar of skin cancer were more likely to perceive a higher risk of skin cancer than those who were exposed to the same news article with less threatening, innocuous, or no pictorial exemplar. In addition, they found that the

effect of perceived risk even lasted two weeks after the exposure. Similarly, Gibson and Zillmann (2000) found that participants who were exposed to a news article about tick disease without pictures were less likely to perceive the risk than those who were exposed to the same news article with pictures of patients. They also reported that people who were exposed to the message with threatening pictures had higher risk perception of tick disease and acquired a greater amount of knowledge than those who were exposed to less threatening pictures. Other studies also found the significant effects of exemplars on individuals' formation of their perception on health risks of food poisoning (Aust & Zillmann, 1996) and skin cancer (Gibson & Zillmann, 2000; Zillmann et al., 2001). The findings of these studies suggest that threatening pictorial exemplars positively influence individuals' attention to news articles, perception of the issues, and recall of the news content.

In spite of the potentially powerful effect of pictorial exemplars of image on information processing of persuasive messages, no researchers have empirically tested the influence of pictorial exemplars on optimistic bias and behavioral change. Indeed, use of threatening pictures has been regarded as a critical factor for increasing the persuasive effect of a health campaign in terms of threat appeals (Eagly & Chaiken, 1993). Threat appeals, defined as "persuasive messages designed to scare people by describing the terrible things that will happen to them if they do not do what the message recommends" (Witte, 1992, p. 329), is well-documented in the literature as an effective strategy in health communication. In fact, a number of studies suggest that a degree of evoked fear due to threatening exemplars may lead individuals to pay more attention to persuasive messages and to engage in recommended preventive behaviors without self-biased optimistic thoughts (e.g., Rogers, 1975; Witte, 1992).

In this sense, it is expected that threatening pictorial exemplars may increase one's own risk perception so that it could reduce optimistic bias related to health risk. Consequently, such reduced optimistic bias will increase individuals' intentions to engage in preventive behaviors. Thus, this study formally states the following hypotheses:

> H3: Optimistic bias of breast cancer risk perception will decrease when individuals are exposed to threatening pictorial exemplars of breast cancer in a news article.
>
> H4: Intention to engage in breast cancer prevention behaviors will increase when individuals are exposed to threatening pictorial exemplars of breast cancer in a news article.

STUDY 2 METHOD

Participants and procedure

Sixty-two female college students were recruited from undergraduate communication classes at a large university in South Korea. The participants' mean age was 19.81 (*SD* = 1.16). All participants were randomly assigned to the two conditions of pictorial vividness exemplars: (a) threatening pictorial exemplar condition (*n* = 32) and (b) no pictorial exemplar condition (*n* = 30). Like the Study 1 experiment, the Study 2 experiment was conducted in a classroom setting. Participants were instructed to read and evaluate the three types of fictitious news magazine articles: (a) economic news (three pages), (b) health news (five pages), and (3) culture and art news (seven pages). Once the participants filled out a survey, they were debriefed and dismissed.

Stimulus

Two types of visual pictorial exemplars were manipulated and inserted in the same breast cancer news article used in Study 1 that included the interviews with four young breast cancer patients in their twenties. The participants in the threatening pictorial exemplar condition were exposed to three threatening pictures associated with breast cancer disease, whereas those in the no pictorial exemplar condition were not exposed to pictures of breast cancer disease. Except for this manipulation, all other conditions, including layout and messages, were identical between the two settings. Figure 2 shows one of the pictures used.

Measures

Perceived risk on self and others. Participants were asked to indicate the likelihood of having breast cancer in the near future on a 7-point scale from 0 (very unlikely) to 6 (very likely) with reference to themselves (*M* = 3.34, *SD* = .87) and others in their same age and gender (*M* = 3.60, *SD* = .91).

Optimistic bias. Differences in scores between perceived risk of self having breast cancer and others were calculated to measure participants' optimistic bias (*M* = .26, *SD* = .99).

Intention to take preventive behaviors. Participants were also asked to rate whether they agreed that they would adopt preventive behaviors against the risk of breast cancer in the near future on a 7-point scale from 0 (strongly disagree) and 6 (strongly agree; *M* = 4.73, *SD* = 1.10).

STUDY 2 RESULTS AND DISCUSSION

A one-way analysis of variance (ANOVA) revealed a statistically significant main effect of the threatening pictorial exemplar for the manipulation, $F(1, 60) = 9.92$, $p < 0.01$, $h^2 = .14$, indicating that the participants in the threatening pictorial exemplar condition ($M = 5.50$, $SD = .76$, $n = 32$) perceived breast cancer as more threatening than those in the no pictorial exemplar condition ($M = 4.87$, $SD = .86$, $n = 30$).

An ANOVA revealed significant main effect of the pictorial threatening exemplars on self-vulnerability to breast cancer, $F(1, 60) = 4.01$, $p< 0.05$, $h^2 = .09$, indicating that the participants in the threatening pictorial exemplar condition ($M = 3.59$, $SD = .76$, $n = 32$) were more likely to perceive that they would have a chance of having breast cancer in the future than those in no pictorial exemplar condition ($M = 3.07$, $SD = .91$, $n = 30$).

Another ANOVA revealed a statistically significant main effect of the threatening pictorial exemplars on the participants' perception of other vulnerability to breast cancer, $F(1, 60) = 10.59$, $p < .001$, $h^2 = .18$, indicating that the participants in the threatening pictorial exemplar condition ($M = 3.97$, $SD = .82$, $n = 32$) were more likely to perceive that other individuals would have a chance of getting breast cancer in the future than those in the no pictorial exemplar condition ($M = 3.20$, $SD = .85$, $n = 30$).

However, another ANOVA with optimistic bias as the dependent measure revealed no statistically significant main effect of the threatening pictorial exemplar, $F(1, 60) = .30$, $p > .10$, indicating that there was no significant difference in the participants' optimistically biased perception between the threatening pictorial exemplar condition ($M = .38$, $SD = 1.01$, $n = 32$) and no pictorial exemplar condition ($M = .13$, $SD = .97$, $n = 32$). Thus, H3 was not supported.

Finally, an ANOVA with intention to engage in preventive behavior as the dependent measure revealed a statistically significant main effect of the threatening pictorial exemplars, $F(1, 60) = 6.06$, $p < .05$, $h^2 = .8$, indicating that the participants in the threatening pictorial exemplar condition ($M = 5.03$, $SD = 1.00$, $n = 32$) were more likely to have intentions to engage in the recommended breast cancer preventive behaviors than those in the no pictorial exemplar condition ($M = 4.40$, $SD = 1.13$, $n = 30$). This finding offers strong support for H4. Table 2 summarizes the results of the hypothesis testing.

In sum, the findings of Study 2 demonstrated that threatening pictorial exemplars increased participants' perception of self-vulnerability to breast cancer and their intentions to engage in preventive behaviors against breast cancer. However, unexpectedly, the findings also indicated that the participants who were exposed to the threatening pictorial exemplar significantly increased their perceptions of others' likelihood of having breast cancer compared to those in the no pictorial exemplar condition. As such, the pictorial exemplar increased the participants' own risk perceptions and others' likelihood of having

Table 2

Summary of Means (with standard deviation in parentheses) and F values for the Dependent Variables as a Function of Pictorial Exemplar

Dependent Variables	Pictorial Exemplar		*F*
	Threatening Picture	No Picture	
Self-vulnerability	3.59 (0.76)	3.07 (0.91)	4.01*
Others-vulnerability	3.97 (0.82)	3.20 (0.85)	10.59**
Optimistic bias	0.38 (1.01)	0.13 (0.97)	0.30
Intentions to engage in preventive behaviors	5.03(1.00)	4.40 (1.13)	6.06*

Note. * $p < .05$. ** $p < .001$

breast cancer at the same time. Consequently, there was no significant difference in optimistic bias in the two conditions.

GENERAL DISCUSSION

Overall, the findings of the current study highlight the important role of a pictorial exemplar in increasing individuals' perceptions of self-vulnerability through health communication campaigns. The pictorial exemplar can be very effective in boosting perceived vulnerability to breast cancer, which can eventually motivate individuals to adopt recommended precautionary behaviors such as mammography. As indicated in the findings of the study, adoption of such preventive behaviors is likely to be promoted by increasing ones' perception of self-vulnerability to the disease rather than by decreasing ones' self-serving bias of optimism. From a practical standpoint, persuasive health message campaigns should make an effort to create appropriate exemplars to elevate self-vulnerability instead of reducing optimistic bias.

However, as opposed to the findings of previous studies (Andsager et al., 2006; Harrison et al., 2000; Stapel & Velthuijsen, 1996), study 1 offered no strong evidence on the positive effect of the age similar exemplar on individuals' perception of their likelihood of experiencing negative health events. One possible explanation of the null relationship is that when the exemplar was relevant to their age, the participants' impression of breast cancer became so unexpectedly serious and consequential that they may have attempted to

avoid the possible risk of having breast cancer and maintained their sense of safety from the particular disease. In this sense, it may be not surprising to see that the participants may have not been significantly different from those who were exposed to the other age similarity conditions in terms of self-vulnerability to breast cancer.

Another possibility is that the participants may have believed that they were relatively young to address the issue of breast cancer so that they may have generated such threat-avoidance mechanisms and maximized their optimistic bias. In fact, age has been considered one of the crucial factors in health communication and young people have higher optimistic bias than older people because they tend to expect their future better and have fewer negative health experiences than older people (Weinstein, 1987). In this sense, the current stimulus of the age-similarity exemplar may have not affected the participants' perception of their own vulnerability to breast cancer. Instead, it may have only influenced their perception on others- vulnerability.

Study 1 also unexpectedly found that the participants who were exposed to the high age similar exemplar were found to often overestimate others-vulnerability to breast cancer than those in the other exemplar conditions. Such findings may suggest that, when the participants were exposed to the similar age exemplar, they might have made more downward comparisons to other individuals in similar age than those in other exemplar conditions to enhance their self-esteem.

The results of study 2 suggest that a threatening pictorial exemplar may be very effective in increasing self-perception of risk vulnerability to breast cancer. However, at the same time, like the age-similarity exemplar, the pictorial exemplar may also lead individuals to make more significant downward comparisons to others in terms of vulnerability to breast cancer. This social psychological process may have reduced the possibility of optimistic bias by intensifying individuals' downward comparisons to others as well as their perceptions of self-vulnerability to breast cancer (Klein & Cooper, 2007; Weinstein & Klein, 1996).

This study is subject to several limitations. First, we utilized young female college students as the participants and the results may be not generalized to other adult populations, particularly the highly vulnerable demographic of females in their forties to seventies. It is plausible that the participants in this study may have been already exposed to breast cancer health campaign messages targeted at middle-aged women and may therefore have formulated pre-existing ideas that breast cancer may be particular to older women.

Next, study 2 used threatening pictorial images only as the pictorial exemplar. In order to verify and elaborate on the role of the pictorial exemplar in health campaigns, future researchers need to utilize multiple levels of pictorial exemplars as the study stimuli, such as high, medium, and low threatening visual exemplars, or emotion aroused and innocuous visual exemplars.

Finally, this study used intention to engage in preventive behavior as a dependent variable based on the assumption that behaviors are strongly guided by intentions (Ajzen &

Fishbein, 1980). However, it should be noted that intentions do not always predict behaviors, especially when individuals are not very concerned about the possible negative health consequences of risks. Since the current study used the young female participants whose perceived risk to breast cancer was low, the potential inconsistency between intentions and actual behavior should be recognized as a limitation of this study.

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MOTHERS' OPINIONS OF TV SNACK/FAST-FOOD ADVERTISING AIMED AT CHILDREN REGARDING ITS OVERALL AMOUNT, CONTENT, AND INFLUENCE ON THEIR CHILDREN'S HEALTH

HYUNJAE YU

TThis exploratory study investigated the opinions of mothers who have at least one child between the ages of 7 and 12 about TV snack/fast-food advertising targeted at children. The mothers' opinions were assessed concerning the amount of the advertising, the advertisements' content, the advertising's influences on children's health, and the need for stricter regulation of the content. The present research also examined whether there is social distance or third person effect in the mothers' opinions about the influence of TV snack/fast-food advertising on children by asking their opinions about the effects on their own children, their friends' children, and the children of people they don't know. The results showed that most mothers in this study believed that there were too many TV snack/fast-food advertisements for their children to avoid, and the content of the advertisements should be improved even if this required stricter regulation. However, it was also found that the mothers believed the children of people they don't know were more negatively influenced by the exposure to the TV snack/fast-food advertising compared to their own children. The third person effect in the context of TV snack/fast-food advertising aimed at children was observed. The complexity of mothers' opinions about TV snack/fast-food advertising was found as well. The mothers hesitated to say that the TV snack/fast-food advertising was the most important

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influence on their children's eating habits. Even though the mothers were generally negative about the impact of TV snack/fast-food advertising on their children and wanted to see more regulation of content, they did not think that the adverting was the most important factor influencing their children's eating habits and health. They thought that they were and should be the most important mediator of how many TV advertisements their children watch and what kinds of food their children eat.

Keywords: TV snack/fast-food ads, Children and advertising, Advertising regulation, Third person effect

As the rate of childhood obesity in the United States has increased rapidly (Frieden, Dietz, and Collins 2010; *Science News* 2010; Debby 2005; Pereira et al. 2005), researchers have begun examining the direct or indirect factors causing children's unhealthy eating habits and obesity (Institute of Medicine of the National Academies 2005; Harrison and Marske 2005).

Currently, about one-third of American children between the ages of 10 and 17 were overweight as of 2007, with roughly half of those children qualified as obese (*Science News* 2010). Obese children have about a 70% chance of becoming obese adults who are more likely to have preventable diseases than adults with normal weight range (Debby 2005; Pereira et al. 2005; *USA Today* 2005).

Several factors influence children's eating habits: children's innate preferences (Young 2003), siblings and peers (Benton 2004), the behavior of adults (Harper and Sanders 1975), parental food preferences and beliefs (Campbell and Crawford 2001), and exposure to diverse media content, including TV snack/fast-food advertising (Caroli et al. 2004). Even though some researchers have doubted that there is a direct relationship between childhood obesity and TV fast-food advertising aimed at children (Ambler 2007; Livingstone 2005), many academic studies and media reports have pointed specifically to such a relationship (Boynton-Jarrett et al. 2003; Henderson and Kelly 2005; Kaiser Family Foundation 2007). However, despite the abundance of research on the effects of TV snack/fast-food advertising on children, studies dealing with the opinions of mothers are comparatively scarce, even though they are often the children's major caregivers (McDermott et al. 2006; Biuzjen and Valkenburg 2003). Even though the importance of mothers in discussions about the impact of TV snack/fast-food advertising on children has been noted in some studies (e.g., Desmond et al. 1985; Warren 2002; Corder-Bolz and Fellows 1979; Rossiter and Robertson 1975), there has been insufficient investigation of their opinions (Buijzen and Valkenburg 2005).

The major goals of this exploratory study are twofold. First, the author aims to investigate the mothers' opinions not only about the amount of TV snack/fast-food advertising aimed at children, but also about its content. This study asks mothers' opinions about the possible influences of TV snack/fast-food advertising on their children in several respects, including the impact on children's food choices, conflicts over food choices between mothers and their children caused by children's exposure to TV snack/fast-food advertising, and the need for stronger regulation of the advertising messages. Second, the author aims to examine the presence of a potential social distance/third person effect (Davis 1983) in the mothers' opinions about the effects of TV snack/fast-food adverting on their own children, their friends' children, and the children of people they do not know.

TV Snack/Fast-Food Advertising Aimed at Children and Mothers' Opinions about the Advertisements: Hypotheses

According to reports, the average child between the ages of 7 and 12 is exposed to about 40,000 TV advertisements a year; the main products they are exposed to are candy, toys, cereal, soda, and fast food (Kunkel 2001; Mercola 2005). More specifically, about 15 TV snack/fast-food commercials are viewed in a typical day by the average American child (Harris et al. 2008). It was also found that advertisements during children's TV programming frequently include high-fat, high-sugar, and low-fiber foods (Kotz and Story 1994; Taras and Gage 1995). Harrison and Marske (2005) reported that about 83% of advertised foods aimed at children audiences are convenience/fast foods and sweets. The researchers found limited presentation of fruits, vegetables, and dairy foods. Most advertised foods during the time when children usually watch the TV exceed recommended daily values (RDVs) of fat, saturated fat, and sodium, while failing to provide RDVs of healthy ingredients, such as fiber, vitamins, and minerals (2005).

Based upon this literature, the present study examines the opinions of mothers, who are often considered as major caregivers for children, regarding their perceptions about the amount of TV snack/fast-food advertising aimed at children, the possible influence of those advertisements on their children, and the need for stricter regulation. Mothers' perceptions about TV snack/fast-food advertising will provide important implications not only for academia and but also for policy makers. Mothers' opinions about advertising have been viewed as a critical reference to examine advertising issues involving children (Young, de Bruin, and Eagle 2003). More specifically, policy makers have utilized parents' viewpoints to establish or modify regulations limiting the content of advertising targeting children (Hawkes 2005).

To generate the first three hypotheses for investigating mothers' opinions about TV snack/fast-food adverting targeted at children, this study employed the theory of agenda setting (McCombs and Shaw 1972). The theory has been used to investigate the possible

relationships between media coverage of a specific issue and people's opinions toward that issues (Len-Rios and Qiu 2005). Mothers' perspectives about issues relating to their children are generally more influenced by media reports than by any other information sources (Jones, Denham, and Springston 2006). Introduced by McCombs and Shaw (1972), the agenda-setting theory suggests a relationship between the prominence given to a specific issue by the media and the public's opinion of the issue's importance (Hester and Gibson 2007; Golan, Kiousis, and McDaniel 2007). Since McCombs and Shaw first indicated that people's general opinions about a political election were shaped by news coverage (1972), the phenomenon of agenda setting has been replicated by numerous researchers. The theory has been applied in diverse fields for more than three decades, including in the field of advertising (Golan, Kiousis, and McDaniel 2007; Meijer and Kleinnijenhuis 2006; Lim 2006).

Many studies have indicated that there has been a significant amount of media coverage dealing with the issue of the negative impact of TV snack/fast-food advertising on children's health (Kaiser Family Foundation 2007; *USA Today* 2005). According to a report by the International Food Information Council (2007), media news coverage discussing the increasing rate of America's childhood obesity and the negative influences of media content, including TV snack/fast-food advertising, has increased from 21% in 1999 to about 30% in 2005 (2007).

The high interest in childhood obesity by the media and the public can be demonstrated by a number of statistics. As an example of the increasing interest of TV networks and newspapers in children's obesity-related issues, the number of Google hits for the words "obesity and the *New York Times*" increased from 8.65 million in January 2005 to about 31 million in February 2007. Also, the words "obesity and *CBS*" returned 863,000 Google hits in 2007, which is an increase of almost 10 times compared to 2005. A number of reports (Centers for Disease Control 2007; Kaiser Family Foundation 2007) have found that much of the media content dealing with obesity issues was actually addressing the relationship between childhood obesity and food advertising targeted at children.

The following hypotheses are formulated based upon the agenda-setting theory presented above and the increased amount of negative coverage by numerous media reports and studies regarding the influence of TV snack/fast-food advertising aimed at children. The hypotheses test the mothers' opinions regarding the three subtopics that are considered critical issues in the related literature: (1) mothers' opinions about the amount of TV snack/fast-food advertising aimed at children (Harrison and Marske 2005; Neeley and Schumann 2004), (2) mothers' perspectives about the possible negative influences of TV snack/fast-food advertising on children's eating habits (Hitchings and Moynihan 1998), (3) and mothers' opinions about the need for stricter regulation of TV snack/fast-food advertising targeted at children (Mallalieu, Palan, and Laczniak 2005).

H1. Current mothers believe that there are too many TV snack/fast-food advertisements aimed at children that their children should avoid.

H2. Current mothers believe that the content of TV snack/fast-food advertisements aimed at children negatively influences their children's eating habits.

H3. Current mothers believe that there should be stricter regulation of the content of the TV snack/fast-food advertising aimed at children.

Next, the present study investigates whether the social distance effect or the third person effect operates when the mothers express their opinions about the possible negative influence of the TV snack/fast-food advertising on their children, their friends' children, and the children of people they don't know. The social distance effect and the third person effect have been observed when people talk about the effect of media content they consider negative (such as sexual expressions in advertising and violence in movies) enough to ask for regulation (e.g., Fang and Yoon; Huh et al. 2004). Therefore, testing to see whether one or both effects operate in the context of the mothers' opinions about the influence of TV snack/fast-food advertising on children will have important implication regarding how current mothers think about the advertising.

Since Davis (1983) suggested the existence of the third person effect based upon research on people's different perspectives toward a 1978 gubernatorial election, many studies discussed this concept regarding different types of mass communication, including news, debates, drama, and political advertising (Perloff 1993).

Most of the subsequent studies have produced findings that support the existence of the third person effect. For example, researchers (Cohen et al. 1988; Gunther 1991; Griswold 1992; Huh, DeLorme, and Reid 2004; Mutz 1989; Salwen 1998) found the effect in people's responses to news, elections, advertising, and other political issues. In addition, censorship of media content because of the third person effect has been the subject of public discussion as well. The third person effect was identified as the basis for supporting restrictions on pornography, gambling, violence, and other anti-social activities manifested in media content (McLeod 1997). Research on the third person effect and advertising has been generally limited to a few topics, such as political advertising (e.g., Rucinski and Salmon 1990; Cohen and Davis 1991), public service announcements (e.g., Duck et al. 1995; Gunther and Thorson 1992), and direct-to-consumer (DTC) drug advertising (Huh et al. 2004). Many studies dealing with advertising and the third person effect have discussed regulation of negative advertising messages. The third person effect has been used as an important theoretical framework to discuss the topic of regulation (Fang and Yoon 2004; Huh et al. 2004). When negative effects on audiences were generally expected from the content of advertising, the third person effect was frequently found in the participants' opinions of the advertising (Gunther and Thorson 1992; Fang and Yoon 2004; Huh et al.

2004). Since negative public opinions regarding the content of TV snack/fast-food advertising (e.g., the use of cartoon characters, the promotion of unhealthy ingredients, the appearance of violence) have been found by many media reports and studies (e.g., Kunkel 2001; Mercola 2004; Campaign for a Commercial-Free Childhood 2007; Harrison and Marske 2005), this study hypothesizes that there will be the third person effect in the answers of the mothers to this study's statements about the effects of TV snack/fast-food advertising on children.

H4. Current mothers believe that their friend's children are more strongly influenced by TV fast-food advertising than their own children.

H5. Current mothers believe that the children of people they don't know are more strongly influenced by TV snack/fast-food advertising than their own children.

METHOD

Sampling Procedures

A purposive convenience sample of current mothers with children between the ages of 7 and 12 was obtained from local parent-teacher organizations (PTOs), church groups, and Little League baseball teams in a southeastern U.S. city (September 15-30, 2010). The respondents were paid $5 for each completed survey. They were asked to fill out the consent form first, before they participated in the survey. The survey was conducted during a meeting or a gathering of each group at a place they usually met (e.g., the elementary schools on the day of a PTO meeting and the churches when they had a gathering). The author asked the mothers to fill out the survey independently without any conversation with other mothers, since some parts of the questionnaire were to check if the third person effect or social distance effect operated in the context of TV snack/fast-food advertising aimed at children. At the request of the mothers of children in Little League teams, the author visited the fields at which the games were held to conduct the survey. Some mothers told the author that they did not have a TV set or had a strict rule not to watch TV at all in the house. In these cases, the author asked them not to fill out the survey.

Questionnaire and Measures

This study adopted the scale originally developed by Young, de Bruin, and Eagle (2003) as the source for the statements to investigate the mothers' opinions of TV snack/fast-food advertising for children. Since this scale consisted of 34 different statements not all of which were related to the present study's hypotheses, the researcher decided to use

only 12 statements, which were modified and used to test the study's first three hypotheses. The statements were given to the participants, and they were asked to express their opinion on each statement using a five-point Likert scale (Strongly agree, Agree, Neither agree or disagree, Disagree, Strongly disagree). Regarding Hypothesis 1, the statement "There are too many TV snack/fast-food ads in TV programs directed at children" was used to ask the mothers' opinions about the amount of TV snack/fast-food advertising aimed at children. Next, eight statements (e.g., "There is too much sugar and fat in snack/fast-food products advertised in television programs directed at children") were given to the participants to investigate Hypothesis 2 about the mothers' opinions about the negative impact of TV snack/fast-food advertising on their children's eating habits. Regarding Hypothesis 3 about the mothers' opinion concerning the need for stricter regulation of the content of TV snack/fast-food advertising aimed at children, three statements (e.g., "There should be a ban on TV snack/fast-food advertising of heavily sugared products aimed at children") were given to participants. Since multiple statements were used to investigate the issues belonging to the second and the third hypotheses, reliability tests were conducted. The results will be reported in the Results section.

Regarding the last two hypotheses dealing with the possible social distance effect (the third person effect), the following four statements were given to participants. The first two statements, comparing the mothers' opinions about the effect of TV snack/fast-food advertising on their own children to the effect on their friends' children, were to investigate the presence of the social distance effect:

> "I think there are more conflicts over food choices between my friends and their children caused by the children's exposure to TV snack/fast-food advertising compared to my children and me."
>
> "More regulation of the content in TV snack/fast-food advertising is needed to help protect my friends' children rather than to protect my children."

The next two statements were applied to check if there was any third person effect in the mothers' opinions about the possible influence of TV snack/fast-food advertising on their own children and the children of people they do not know.

> "I think there are more conflicts over children's food choices between people I do not know and their children caused by the children's exposure to TV fast-food advertising compared to my children and me."
>
> "More regulation of the content in TV fast-food advertising is needed to help protect the children of people I do not know rather than to protect my children."

RESULTS

Participants

The author collected the surveys (329 completed surveys) using two methods. For one method, the author visited a place where potential participants were attending a meeting (e.g., a PTO meeting in an elementary school), distributed the surveys, and waited until they were completed. For the second method, the author left the surveys with group leaders and came back in two or three hours to pick up the completed surveys. A total of 329 surveys were collected; however, 11 surveys were incomplete. Therefore, a total of 318 completed surveys were collected (adjusted response rate was 48.5%), missing values in the surveys were eliminated from the statistical analysis by coding them with the number 99, and the values did not influence the results.

The largest group consisted of mothers of 10-year-olds (21%, 66 children), and the smallest group consisted of mothers of 8-year-olds (12.4%, 39 children). Mothers of boys were somewhat more prevalent (59.7%, 187 children) than mothers of girls (40.2%, 126 children) in the sample. Among the mothers, 83.2% had more than one child who was living with them. More detailed demographic information of the sample can be seen in Table 1.

Mothers' Opinions about TV Snack/Fast-food Advertising (Hypotheses 1–3)

To analyze the results from the mothers' answers, this study used a series of chi-square goodness-of-fit tests to check whether there were significant differences between the mothers' agreements with each statement and their disagreements with each one. The research originally used a five-point Likert scale, but the author decided to alter the scale to a three-point scale by merging Strongly disagree and Disagree into Disagree, and Agree and Strongly agree into Agree. The reasons for this modification were twofold. First, for some statements, most mothers selected extreme responses (Strongly disagree, Strongly agree) rather than Agree or Disagree; it seemed less reasonable to use the results from the two categories (Disagree, Agree) separately. Therefore, the author reduced the number of categories to three by merging some categories for clearer statistical comparison. Second, the author believed that combining the categories and comparing the differences among the simplified categories would provide more implications for the study. In conclusion, the answers from the mothers to each statement were organized into Agree, Disagree, and Neither Agree nor Disagree, and the differences were compared employing the chi-square goodness-of-fit tests, which use the frequency of the answers instead of percentages for comparison among the answers. The tests were also conducted to check if there were any social distance effect or third person effect in the mothers' opinions of the negative impact

Table 1
Characteristics of Survey Respondents

Total participants (N)		318		
Age (mean value)		39.7		
			Percent (%)	Frequency
Mothers' age	24–30		11.1%	35
	31–40		47.6%	150
	41 or more		41.3%	130
		Total	99.0%	315
Race	Caucasian/White		71.8%	227
	African American/Black		18%	57
	Asian		3.8%	12
	Hispanic/Latino		3.5%	11
	Other/mixed race		2.8%	9
		Total	99.9%	316
Marital status	Currently married		74.4%	236
	Separated or divorced		13.9%	44
	Widowed		.6%	2
	Never married		7.3%	23
	Living with partner		3.8%	12
		Total	100%	317
Education	Some high school		4.7%	15
	Completed high school		11.7%	37
	Some college		19.9%	63
	College graduate		34.1%	108
	Attended graduate school		29.4%	93
		Total	99.8%	316
Employment	Fully employed		49.7%	158
	Partly employed		19.2%	61
	Self-employed		8.2%	26
	Not employed		23%	73
		Total	100%	318
Household income	Less than $20,000		10.2%	31
	$20,000–40,000		17.4%	53
	$40,001–60,000		20%	61
	$60,001–80,000		18%	55
	$80,001–100,000		11.8%	36
	$10,001–120,000		4.6%	14
	$120,001 or higher		18%	55
		Total	100%	305
Child's age	7		17.1%	54
	8		12.4%	39
	9		15.6%	49
	10		21%	66
	11		14.6%	46
	12		19.4%	61
		Total	100%	315
Child's gender	Boy		59.7%	187
	Girl		40.2%	126
		Total	99.9%	313

* Not all bases equal to N (318) due to non-responses.

of TV snack/fast-foods advertising on their own children and others people's children (Hypotheses 4 and 5).

Regarding the hypothesis 1, the mothers' opinions of the amount of TV snack/fast-food advertising aimed at children were tested with the statement: "There are too many snack/fast-food ads in TV programs directed at children."

The mothers' answers showed that there were significant differences between agreement with the statement and disagreement with the statement *($p<.01$)* (Table 2). A total of 237 mothers agreed with the statement, but only 23 mothers disagreed. Therefore, it could be said that Hypothesis 1—"Current mothers believe that there are too many TV snack/fast-food advertisements aimed at children that their children should avoid" —was supported.

Next, eight statements were used to examine the mothers' perspectives toward the possibly negative impact of TV snack/fast-food advertising on their children's eating habits. The fact that those eight statements were on the same topic was supported by getting acceptable reliability (Cronbach alpha = .738). Different levels of agreement were found among the mothers' answers to those statements. Even though the mothers strongly agreed that the snack/fast-food products advertised to their children contained too much sugar and fat ($p<.01$), they had different opinions about the statement asking if the TV snack/fast-food advertising was the main influence on their children's eating habits ($p<.01$). The mothers also hesitated to predict that their children's eating habits would be healthier if TV snack/fast-food advertising aimed at children was banned ($p<.01$). Based upon the results, Hypothesis 2 was partly supported.

Lastly, three statements concerning the mothers' opinions about regulation of the content in TV snack/fast-food advertisements targeted at children were used to test Hypothesis 3 (Cronbach alpha =.857). As seen in Table 2, the mothers strong agreed with all the statements about stricter regulation of TV snack/fast-food advertising. For example, 172 mothers agreed with the need for regulation of advertisements for heavily sugared snack/fast-food products ($p<.01$). Therefore, Hypothesis 3 was supported as well.

Social Distance Effect and Third Person Effect (Hypotheses 4–5)

To check if there were any social distance effect in the mothers' opinions of TV snack/fast-food advertising's impact on their own children and their friends' children, participants were asked to respond to the following statement: "I think there are more conflicts over food choices between my friends and their children caused by the children's exposure to TV snack/fast-food advertising compared to my children and me." Many mothers indicated neither agreement nor disagreement. The results were similar for the second statement: "More regulation of the content in TV snack/fast-food advertising is needed to help protect my friends' children rather than to protect my children." More than 50% of mothers checked Neither agree nor disagree. Based upon the results, it could be said that Hypothesis 4—"Current mothers believe that their friend's children are more strongly influenced by TV snack/fast-food advertising than their own children"—was not supported.

Table 2.
Mothers' Opinion toward the TV Snack/Fast-food Advertising Aimed at Children

Statements	Agree	Disagree	Neither Agree / Disagree	Sig.
*There are too many ads in TV programs directed at children.	237	23	56	P<.01
**Television advertising aimed at children uses tricks and gimmicks.	251	28	38	P<.01
**There is too much sugar and fat in food products advertised in television programs directed at children.	251	18	49	P<.01
**TV advertising is an important cause of my child pestering me for advertised products.	181	84	53	P<.01
**TV ads encourage my child to want products he/she doesn't need.	247	37	34	P<.01
**TV advertising aimed at children leads to family conflicts in my house.	57	177	78	P<.01
**My child is deceived by advertisements more easily than me.	248	32	35	P<.01
**Snack and fast-food advertising is the main influence on my child's diet.	24	235	58	P<.01
**If snack and fast-foods were not advertised, my child's eating habits would improve.	57	176	82	P<.01
***Ads aimed at children under the age of 12 should be banned.	126	85	98	P<.01
***Most advertisements deceive children.	188	42	87	P<.01
***There should be a ban on advertising heavily sugared products aimed at children.	172	58	88	P<.01

*The statements used for testing H1. ** The statements used for testing H2. *** The statements used for testing H3.

In response to the first statement designed to test whether there was a third person effect, many mothers showed agreement (Table 3). The difference between the rate of agreement and the rate of disagreement was statistically significant ($p<.01$). Therefore, the third person effect was present in the mothers' answers. However, to the second statement about the need for regulation, not many mothers agreed (Table 3). Therefore, Hypothesis 5 was partly supported.

DISCUSSION

Complexity of the Mothers' Opinions about the Negative Impact of the TV Snack/Fast-food Advertising on Their Children

Previous literature has shown that the number of snack/fast-food advertisements aired during the time period when children generally watch TV is too high for mothers and

Table 3.
Mothers' Opinions about Their Friends' Children and Other People's Children regarding the Influence of TV Snack/Fast-food Advertising on Children

Statements	Agree	Disagree	Neither Agree / Disagree	Sig.
Social distance/ Comparison between my children and my friends' children				
I think there are more conflicts over food choices between my friends and their children caused by the children's exposure to TV snack/fast-food advertising compared to my children and me.	86	52	180	*P<.01*
More regulation of the content in TV snack/fast-food advertising is needed to help protect my friends' children rather than to protect my children.	54	91	173	*P<.01*
Third person effect/ Comparison between my children and other people's children				
I think there are more conflicts over food choices between the children of people I do not know and their children caused by the children's exposure to TV snack/fast-food advertising compared to my children and me.	150	33	135	*P<.01*
More regulation of the content in TV snack/fast-food advertising is needed to help protect the children of people I do not know rather than to protect my children.	85	64	169	*P<.01*

children to avoid being exposed to them (Harrison and Marske 2005). According to a report from the Federal Trade Commission (2006), the average American child saw nearly 5,000 nationally aired snack/fast-food advertisements on TV in 2004. The results of the present study showed that most mothers generally believed that there were too many TV advertisements for unhealthy snack/fast-foods aimed at their children. They also believed that this situation should be changed to improve their children's health.

The mothers believed that the more their children were exposed to TV snack/fast-food advertising, the greater effect those advertisements had on their children's food choices in a negative and unhealthy way. Many mothers desired regulation of advertising aimed at children between the ages of 7 and 12. Even though some mothers felt that they should be more responsible for the TV their children watched, many of them thought that the government should ban all the advertising aimed at children under the age of 12.

Most mothers in this study indicated that the TV snack/fast-food advertisements (1) encourage unhealthy eating habits in their children, (2) lead to nagging behavior that may cause parents to buy what they do not need, and (3) are fooling their children by using tricks and gimmicks (Table 2). These negative opinions of the mothers could be influenced by the dominant agenda created by numerous media reports and studies indicating the negative impact of TV snack/fast-food advertising on children (Gallup 2006; Kaiser Family Foundation 2007; Nemours Foundation 2007). However, as seen in the results, the mothers actually hesitated to say that the TV snack/fast-food advertising aimed at their children was the most important influence on their children's eating habits. Therefore, even though it was clear that the mothers were generally negative about the impact of TV snack/fast-food advertising on their children and wanted to see more regulation of content, they did not think that TV snack/fast-food advertising was the most important factor influencing their children's eating habits and health. The mothers thought that they were and should be the most important mediator of how many food advertisements their children watched and what kinds of food their children ate.

Actually, previous studies found conflicting results concerning parents' opinions about the impact of advertising targeted at children (Grossbart and Crosby 1984; Hawkes 2005). For example, Burr and Burr (1976) indicated that parents partly understood the advertisers' major purpose was making profits; therefore, parents were not likely to criticize the companies' advertising effort, even though they were not happy about the content of the advertisements. Therefore, the parents felt that it was their responsibility to monitor the impact of the advertising on their children. The parents' opinions about the TV snack/fast-food advertising aimed at children were complex and not straightforward. Burr and Burr stated that parents had "a strong degree of cynicism" (1976, p. 37) about forcing companies to be responsible regarding this issue. Also, the researchers found that while parents criticized prizes and premiums advertisers used in their advertising to attract children, they also were cynical about regulation to force the companies to change their behavior (Burr and Burr 1976).

Buijzen and Valkenburg (2003) indicated, through their parent-child dyad study about advertising effects on children, that parents did not blame the TV snack/fast-food advertising solely for the major negative effects on their children, such as obesity, materialism, and family conflict. According to their results, parents felt that several other factors should be considered in addition to the companies' actions and regulation to deal with the effects of advertising on children. Buijzen and Valkenburg indicated that the intervention of parents was one of the most critical factors for this issue, and many parents in the study realized that they played significant roles (2003, 2005).

This study revealed the mothers' complicated opinions and cynicism about TV snack/fast-food advertising aimed at their children; they did not feel that the food advertising was the only or the most important factor in their children's health, even though they

believed that the advertising had several negative effects on their children. In addition to accepting the reality that the food companies were interested in increasing their sales by all legal means, mothers perceived that any advertising mediation on their part and managing the healthy eating habits of their children were the most important factors to improve their children's health.

Social Distance and Third Person Effect in the Context of the Mothers' Opinions about TV Snack/Fast-food Advertising

Regarding the four statements that attempted to measure the possible social distance and third person effects in mothers' opinions of the influences of TV snack/fast-food advertising on children, the first two statements asked about the possible differences in mothers' opinions of the influences of TV snack/fast-food advertising on two different types of children ("I think there are more conflicts over food choices between my friends and their children caused by the children's exposure to TV snack/fast-food advertising compared to my children and me," and "More regulation of the content in TV snack/fast-food advertising is needed to help protect my friends' children rather than to protect my children"). It was found that many mothers did not believe their own children were less influenced by TV snack/fast-food advertising compared to the children of their friends. The other two statements asked the mothers about the influences of TV snack/fast-food advertising on the conflict regarding food choices with their children and the need for stricter regulation of the content of the advertising. The statements used the possible differences between the opinions about the mothers' own children and the children of the people they do not know as a test for the third person effect. Different from the results of the previous two statements, the mothers answered that they and their own children have fewer conflicts regarding food choices originating from watching TV snack/fast-food advertising than other people's children and their parents. The difference of the opinions about their children and the children of the people they do not know was statistically significant.

As several studies indicated, the third person effect (Davis 1983; Gunther 1991; Brosius 1996; McLeod 1997; Salwen 1998) was generally found from media content causing negative public opinion (Duck et al. 1995; Fang and Yoon 2004), such as sexual content in the media (Duck et al. 1995), unethical content of DTC advertising (Huh et al. 2004), and the dangers of binge drinking (David et al. 2004). Since the core notion of the third person effect is that an individual considers that he or she is less influenced by negative media content than other people, the results from this study could indicate that most mothers considered that the content of the TV snack/fast-food advertising was hazardous enough for their own children to show the third person effect.

Limitations and Recommendations

Even though the mothers' perspectives were considered the most important factors for this study, it is possible that information provided by other family members, such as fathers and even the children themselves, could be useful. Therefore, one potential future study could employ similar statements but include the children, fathers, and other family members as participants. The other limitation of this study could be the similarity of demographic or psychographic characteristics of the mothers. Since the participants were recruited from organizations such as PTOs and Little League baseball teams, it is possible that the mothers in the sample were more active mothers than mothers who did not participate in those gatherings. Generally, most mothers in the sample were dedicated to their children and actively participated in all kinds of events in which their children were involved. Therefore, it is possible that many of the participants share certain personality traits, like being sociable, active, confident, and very committed to their children. This possible homogeneity among the participants might have caused a lack of diversity in responses in some parts of this study. While recognizing this possible limitation, a future study could extend the sample to less active mothers who might have different opinions about the possible negative influence of TV snack/fast-food advertising on their children.

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'GIRLS' NIGHT OUT!': OLDER ADOLESCENTS' FAVORITE ALCOHOL ADVERTISEMENTS

ROSALIND N. KOFF AND MEGAN A. MORENO

Alcohol advertisements are frequently seen by older adolescents and can be influential towards alcohol use. This study investigated female college students' preferences and evaluations of alcohol advertisements. During 10 age-specific focus groups, students were asked to select and discuss a "favorite" advertisement from a selection of 13 alcohol advertisements. Among our 46 participants, both freshman and upperclassman groups identified similar favorite advertisements. However, when upperclassmen were asked to choose the advertisements they felt would have been their favorites as freshmen, upperclassmen identified dramatically different ones. Upperclassmen then justified this gap, describing perceived maturity and experience. These findings reflect conflicting views of perceived experience and advertising influence.

Keywords: adolescent, alcohol, advertising, appeals, mass communication

Alcohol-related harm among college students remains an important national problem associated with sexual assault, morbidity, and mortality (Abbey, 2002). The majority of college students have experimented with alcohol, with 90% of college students reporting alcohol consumption at least one time during the past year (Kuo et al., 2002). Although most college students have tried alcohol, female students are at higher risk for negative

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consequences such as drinking after deciding not to, blacking out, and getting injured (Sugarman et al., 2009).

Expectancies have been associated with motivations to drink for college students. Expectancies are defined as beliefs or expectations about direct pharmacological effects and indirect behavioral, interpersonal, and social effects of alcohol that affect drinking patterns (Fromme, 2002). Positive drinking expectancies include sociability, tension reduction, disinhibition or "liquid courage", and enhanced sexuality. Media is influential in establishing adolescent attitudes and behaviors towards alcohol consumption, in part by supporting or promoting alcohol-related expectancies (Gruber, 2005; Singer, D., 1985). Television, movies, and music have been associated with increased positive attitudes and earlier initiation of alcohol use among adolescents (Sargent, 2006; Hanewinkel, 2009). Advertisements are a less-studied form of media in their influence on promoting alcohol related expectancies (Gruber, 2005; Primack, 2008; van Hoof, 2009). Previous work suggests that alcohol advertisements may positively influence adolescents' drinking intentions and behaviors (Atkin, 1984; Wyllie, 1998; Austin, 2006; Ellickson , 2005; Snyder , 2006; Stacy, 2004). Specific brands who wish to advertise among youth-driven markets do so in magazines with the highest youth readership, resulting in disproportionately high adolescent exposure to alcoholic beverage advertising (King, 2009). Alcohol advertisements may target adolescents as an underage marketing venture in order to establish brand preference and loyalty early. It is unclear whether that brand loyalty persists or is remembered by students as they transition from underage to legal drinking. Advertisements may play a particularly strong role in setting alcohol expectancies among college women, as studies on persuasion in advertising show that females have stronger, more positive reactions to the messages in advertisements compared to their male peers (Putrevu, 2001; Covell, 1994).

The purpose of this study was to investigate the relationship between female college students' attitudes and expectancies regarding drinking as applied to their favorites among selected alcohol advertisements. We were particularly interested in how underage college freshmen viewed advertisements compared to their of-age peers and whether their views and appeals to advertisements would change as they became of legal drinking age.

Materials and Methods

Participants

Between February and March 2010, participants were recruited through purposeful sampling at a large state university. Eligible participants were female undergraduate students. A trained female facilitator identified key contacts on campus with the goal of recruiting females from a variety of university housing options. The facilitator informed the

key contacts on the objectives of the research. The key contact then recruited three to five female peers to accompany her to the focus group. All individuals who attended the focus groups and met the eligibility requirements participated. Each participant gave written consent for participation. Participants received the choice of a meal or a five-dollar gift card for participating. The University of Wisconsin-Madison Institutional Review Board approved this project.

In order to identify alcohol advertisements that were likely to be seen by female college students, a search was conducted using the Simmon's Choice database to identify the top five magazines read by college age females in Madison, Wisconsin. Copies of these magazines were obtained and screened for alcohol advertisements. Alcohol advertisements were selected from these magazines. Of the alcohol advertisements found, we determined relevant alcohol brand names in a pilot group among a college student population. A total of thirteen advertisements were selected and used in focus groups. Ads were scanned and turned into PDF documents. During focus groups, they were re-distributed on 8.5x11 color paper with one advertisement on each page. In order to help participants focus on alcohol messages and advertisement design rather than brand recognition, all brand names were removed from advertisements.

Focus Groups

A trained female facilitator conducted semi-structured focus groups. Focus groups were the optimal method to investigate this topic as they provided "real life" data on needs, beliefs, attitudes, and values of participants (Berg, 2009). Focus groups also allow for participant interaction and encourage participants to build on others' comment, which leads to greater insight into why certain opinions or views are held (Kitzinger, 1994). To both increase participant comfort and to investigate the variance of opinions, groups were organized with freshmen participants together and in groups separate from upperclassmen. The majority of upperclassmen participants were of legal drinking age.

First, the facilitator introduced the project and explained the purpose of the focus group. Participants were then shown the thirteen alcohol advertisements printed on 8.5x11 inch paper and asked to take a few minutes to review them. Then, they were asked to discuss their thoughts and interpretations of the advertisements in relation to college views of alcohol consumption. Next, each participant was provided an individual stack of all thirteen advertisements and asked to select and anonymously submit their "favorite" advertisement to the facilitator by selecting the image from a pile and passing it face-down. The ads were then shuffled and shown one by one to the group for discussion, without identifying which participant had selected the ad as a favorite. The group was asked to discuss various design and thematic elements of the selected advertisements. They were asked open-ended questions such as "what themes are being expressed in this advertisement," followed by

Figure One: Focus Group Questions

Sample questions asked: (all groups)
Why is this advertisement your favorite?
What themes are being expressed in this advertisement?
What kinds of behaviors or consequences are being depicted?
Is this advertisement realistic? Why or why not?
Sample Questions asked: (upperclassmen groups only)
In considering the favorite advertisements and drinking expectations of a freshman, now looking back to your freshman year, what advertisements do you think would have been your favorites?
Do you think that your expectations for drinking have changed from freshman year to now?

detailed questions such as "what behaviors or consequences are being depicted in this advertisement." Figure 1 provides the list of questions used in each focus group. Each focus group lasted between 45 and 75 minutes. All focus group discussions were audio recorded and fully transcribed.

Analysis

In each focus group, the facilitator recorded favorite advertisements on paper. Favorite advertisement selections from all groups were combined to determine overall totals. All transcripts were read and coded by three investigators. Transcribed data from each focus group was first analyzed separately, after which a merged document of themes and corresponding text was created in the grounded theory tradition. Investigators discussed and reached consensus among major themes in the data and determined illustrative quotations.

RESULTS

A total of forty-six females participated in ten focus groups. All participants contributed to discussions. All participants reported recollection of having seen current alcohol advertisements. All participants participated in selecting a favorite advertisement.

Figure 2: Overall Favorite Advertisements

The overall themes from our data were a similarity in selected advertisements by both freshmen and upperclassmen students and a mismatch in favorite selection by upperclassmen reflecting on their freshmen year.

The same favorite advertisements were selected by both freshmen and upperclassmen despite differences in stages of development, as seen in figure 2. The freshmen overwhelmingly selected advertisement number twelve (eight nominations) advertisement number three (five nominations) and advertisement number seven (four nominations) as favorites. The upperclassmen selected similar favorite advertisements, with advertisement number seven (five nominations), and advertisement number twelve (four nominations), while advertisement number three was chosen as a favorite by only one participant. However, when upperclassmen reflected upon which would have been their favorite advertisements as freshmen, upperclassmen identified entirely different advertisements – mentioning all advertisements *other* than the actual selected advertisements.

First reviewing the freshmen's favorite advertisements, participants identified the appeals of glamour, success, relaxation, lack of male presence, positive consequences, and the potential for finding love.

In advertisement number three, freshmen identified the main appealing themes as relaxation, no male presence, and no consequences. Participant ideas of relaxation seen in this advertisement were described as a, "relaxing atmosphere," "selling a simple idea," "it

[is] so chill," "lack of pressures," "free of pressure," and "relaxing drinking." Sample quotes of participant perceptions of no male presence are, "it's not saying… you're going to dance on bars, or meet a guy," and "it's nice that this ad isn't sexual…sexual ads just… have too much tension." Several participants interpreted this advertisement to represent a lack of consequences by describing, "there are no consequences – no hangover, no calories, no making bad decisions… no pregnancy or dehydration from alcohol."

In advertisement number seven, freshmen identified the main appealing themes as glamour, success, and a potential for finding love. Sample quotes of participant perceptions of glamour are, "its sophisticated…sitting with a martini glass cheering with a guy," "classier people," and "[it shows that] drinking doesn't have to be so cheap or sleazy." Participant ideas of success in this advertisement were noted by, "a higher status," "expensive alcohol," and the "depict[ion of] a lifestyle of the rich and famous." Many participants expressed opinions on the potential for finding love in this advertisement. One female said, "this is what would happen if you went on a date with someone," and "you will be able to find someone you love." Another stated, "they are not going to hook up right now, it's… a call me later thing, you know?" An additional female remarked, "finding love, going on dates – we don't get to do any of that," and "you're more likely to meet the person who is compatible as more than a one night stand – which we don't get to experience."

In advertisement number twelve, freshmen identified the main appealing themes as glamour, success, no male presence, and no consequences. Participants described their perceptions of glamour in this advertisement as, "the [women are] sophisticated, excited, and glamorous… and classy!" and "they are a bunch of beautiful women who are toasting, and associate with being beautiful and glamorous." Many participants also thought this advertisement expressed success, with sample quotations of, "it's very sexy to have your life in order," and "they [are] people who… have a job lined up and seem successful because they are riding in a limousine." One participant expressed, "this ad makes me feel like I wish I were rich." A few participants expressed their perceptions of no male presence in the advertisements as, "you don't need that pressure [of men] – that's a big stress for girls," and "no guys therefore no pressure… it is busy but not overwhelming with the pressure of guys and confidence." Finally, some participants mentioned perceptions of no consequences present as, "there are no consequences, nobody's embarrassing themselves, they didn't drink too much alcohol, they're not sick, no one is yelling at them… it's a party you don't want to miss!"

Second, reviewing the upperclassmen's favorite advertisements, participants also identified the appeals of glamour, success, and a lack of male presence, but discussed these topics under a futuristic and self-empowering lens.

In advertisement number seven, upperclassmen identified the main appealing themes as glamour, success, and a potential for love. Many participants expressed ideas of glamour as, "[this ad shows] sophisticated sexuality," "the martini glasses are special and stylish and

Figure 3: Favorite Advertisement Nominations

Advertisement Number		1	2	3	4	5	6	7	8	9	10	11	12	13	Total
Number of times selected as favorite	Freshmen	3	3	5	1	0	0	4	0	1	0	1	8	0	26
	Upperclassmen	1	2	1	1	1	1	5	0	2	0	0	4	2	20
	Overall	4	5	6	2	1	1	9	0	3	0	1	12	2	46

classy," "everybody looks good, everybody looks classy, and… smooth," and, "encouraging non-trashy behavior." Most participants viewed success as a main appeal of this advertisement. Some quotations are, "it is an upper scale looking club and they are all really rich," "it is professional… after work," "to be successful… there is just a lifestyle that some people want," "striving to be older… I can't wait to be out of college and have a real job," "I am looking towards the future and how I want my life to be," and "I don't think it's relatable to me right now but it is definitely real-life in the future so I think that is why it is appealing to me." A few participants found an appeal to finding love in the depiction of an older setting with older males, and therefore "having their lives together" and looking towards the future for a male who "has a job and has goals and priorities."

In advertisement number twelve, upperclassmen identified the main appealing themes as glamour and a lack of male presence. Many participants see perceptions of glamour in this advertisement as represented by, "toasting out of a car, drinking cosmos, showing glamour," "the epitome of class...if you have…a cool martini glass," and "in society, classy is something you aim to be – you want to be the classy, fun girl." Sample quotes of participant appeals of no male presence are, "there are no men to hold them down," "dressed up to hang out with their girls and it's not like they are dressing up…to impress anyone," "all you need are your girls to get by," "feel[ing] good about being independent, celebrat[ing] themselves," and "escape from your – the men in your life."

While the overall favorites of upperclassmen were the same as the underclassmen, the rest of the favorite advertisements selected were much more diverse and wide-ranging, showing some development in one's drinking appeals. Contrasting the outstanding favorite advertisements of the freshmen, upperclassmen show some interest in other advertisements in addition to their favorites, as seen in figure 3.

Finally, when upperclassmen reflected upon what would have been the favorite advertisements as freshmen, upperclassmen identified entirely different advertisements – mentioning all advertisements *other* than the actual selected favorite advertisements, as seen in figure 4.

Figure 4: Perceived Favorite Advertisements for Freshmen, Selected by Upperclassmen

Upperclassmen justify this disparity with claims of experience and matured values. In discussing their reflections of appeals when they were freshmen, upperclassmen identified an established social circle as a main source of influence on their shifting opinions toward alcohol consumption. Two forms of this social comfort are through friends and sexuality.

One participant stated that social anxieties about the creation and maintenance of friendships could create appeals towards advertisements "where it feels like you can be really social and well-liked… just have a solid group of friends." Another participant commented that a common motive behind drinking freshman year is "to prove that you're attractive, you fit in, people want you, [and] people want to be your friend – you're trying to prove that you're good." Reflecting, however, participants agreed "now [as upperclassmen]… you already have your friendships kinda set, [so] you don't need that quick-bonding, like going out and drinking and talking about it. Your friendships [now] are a little more self-sustaining you don't need crazy things to happen to have something to talk about."

Participants also felt their drinking expectancies towards sexual contact have progressed over their college careers. Connecting conversation of sexuality to friendships, one participant noted a maturing interest in relationships "as a freshman your friends were envious of a hot sexy night you had with a guy whereas now they are envious of an awesome

date that you had." However, freshman year, a participant explicitly described, "when I was a freshman I would for sure want the ones that made me feel like… I could lose my virginity… no but like, hook up with a boy." Another participant noted, "as a freshman I definitely used alcohol to loosen up around older guys or to make myself more approachable or comfortable around them," and explained, "now, I have experienced that and I don't want to anymore – it got old very fast." A peer added, "now we know it's not that hard to get drunk and go out and make out with a guy. Like it's really not that appealing anymore – but it definitely was." Another stated that negative experiences played a large role in changed drinking expectancies involving sexuality, saying, "just having too many poor experiences with negative consequences and alcohol and sexuality, it was enough for me to realize that it was kind of a dangerous combination."

Upperclassmen articulated that a social desire for both peer and romantic interaction acted as large driving appeals for alcohol consumption as a freshman, but felt these pressures no longer existed for their age group.

Another way upperclassmen identified change in their attitudes toward consumption was through consuming alcohol itself. Two changes in consumption identified were the types of alcohol consumed, and the amount of alcohol consumed. Upperclassmen indicated that as a freshman, students drink any type of alcohol they can obtain, whereas older students are increasingly selective of the alcohol they consume. One participant explains, "freshman year you would always buy the cheapest, like Fleishmann's or the stuff that really tasted terrible," or "you would go drink tons of beer out of kegs and now I think its more like, if we're going to drink beer we want to get nice beer and kind of just hang around and drink a couple bottles." Another commented, "I would say about 90% of the time I drank beer, or Everclear… honestly – you don't ever enjoy a drink."

As freshmen, upperclassmen also reflected on the amount of alcohol they consumed as decreasing as they got older. Enthusiastically, a participant stated, "right off the bat, I drank 10 times more freshman year than I do now." Another said, "a big difference is that freshman year you think that getting trashed is glamorous or like super fun whereas now you look at it and you're like actually that's really bad." Claiming that experience changes drinking habits, a participant said, "now, after we have been drinking for a couple years, I prefer to – I don't like drinking a lot at one time." Reflecting, a participant said, "[seeing] people who are super drunk and it's kind of like – we know that happens, we did that, but I don't want to be like, that trashiness is not my goal anymore."

Upperclassmen identified a lifestyle change of independence as being a changing factor in their attitudes towards alcohol consumption. This lifestyle change was described as living on one's own and the presence of personal responsibilities and accountability. "I drank more because I was free," one participant stated, "when you come to college… for the first time you [can] do whatever the fuck you want." Another explained, "it's your first time…away from your parents. You don't have anyone telling you what to do and stuff so

you feel like you can just do whatever you want so why not just meet people and get really drunk." Now as upperclassmen, however, participants explained, "we've been away from our parents long enough… we are used to being on our own and not having people telling us what to do so it's not like a big new experience." As near-college graduates, participants expressed a difference in their alcohol consumption because of new responsibilities and accountability for their actions. "When you are younger you have less going on and you're less future orientated... the reality of school and jobs and work and finding different opportunities isn't as present to you," explained one participant, "you know, you just got to college – you just got to the big party." Another considered, "now we want people to respect us, where, if at a job we are speaking in front of a room of men we want their attention and for them to agree with us, 'yes that is a good idea,' we don't want – if I wanted sexual attention [like in these ads] I could go live at the playboy mansion."

DISCUSSION

Our study provides an exploration of female college students' views and attitudes towards alcohol advertisements. The same favorite advertisements were selected by both freshmen and upperclassmen, despite differing legal and developmental stages. However, when upperclassmen reflected upon which would have been their favorite advertisements as freshmen; upperclassmen identified entirely different advertisements – mentioning all advertisements *other* than the actual selected advertisements.

Our findings may have important media messaging implications as they point out maintenance in the influence of alcohol messages — regardless of age or experience. Upperclassmen are seen to retain visual drinking appeals, showing that experience cannot trump internalized messages displayed in advertisements. Students of all ages and experience levels seem to internalize the drinking scenarios depicted by alcohol messages. This study emphasizes the way in which older adolescents continue to seek the drinking experiences and scenarios depicted in advertising. The high influence of alcohol advertisements prior to use, or in the early stages of use, persist through later years of experimentation and use. These advertisements are modeling drinking in new, exciting ways for adolescents in many stages of development.

Investigating the 'favorite' advertisement selections of freshman participants, one might explain their choices through drinking expectancies. Reviewing the four positive drinking expectancies of sociability, tension reduction, liquid courage, and sexuality, each of the three favorite advertisements selected suggests these expectancies. Freshmen may be reinforcing their attraction to these appeals in selecting these advertisements. Interestingly, most freshmen reported enjoying all of these appeals with the exception of 'sexuality.' This may be because sexuality in advertisements in general found to cater to a male audience (Messner, 2005).

We were surprised to find that upperclassmen chose the same favorite advertisements as their freshmen counterparts. While the selected advertisements match those chosen by the freshmen, the conversation and evaluation around the advertisements were slightly different. Appeals to one's future of success, for example, were mentioned by both freshmen and upperclassmen. However, upperclassmen were sure to point out these elements as looming and near in the future — with jobs and relationships as familiar, modern pressures in their lives.

Perhaps the most surprising result of our study is the mislabeling of favorite advertisements by upperclassmen participants. As the selection of favorite advertisements suggest that drinking expectancies perpetuate throughout college, regardless of actual experience, the upperclassmen maintain a perceived maturity and experience that their attitudes towards alcohol consumption are vastly different from when they were freshmen. Upperclassmen seem to idealize their personal growth through citing both positive and negative experiences of their own and of their friends.

One limitation of our study is that, given the qualitative approach, generalization to other universities or genders is not warranted. Further, social desirability bias states that participants will respond to questions in a manner that is most favorably viewed by others. While the favorite advertisements were identified confidentially, the overall group discussions of the messages created a potential circumstance of social comparison or insecurity that could have prompted freshmen - who are in a particularly insecure stage of creating one's identity - to respond in what they felt was most popularly appealing rather than personally influential.

Despite these limitations, our study has important implications. This study gives greater insight into college student attitudes and expectancies of alcohol in advertising. The consistency of appeals indicates a strong presence of media on modeling behaviors of alcohol consumption for older adolescents. The drinking expectancies of this population are expanded and reaffirmed through these advertisements, which calls for new educational media literacy strategies in health education. Second, these views and appeals can be considered in future development of health education involving alcohol consumption and media literacy. This population may be taught to understand the drinking expectancies and how they can be represented in media; adolescents may apply this education to their evaluation and interest in media messages targeting them.

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EXAMINING INFLUENCE DURING A PUBLIC HEALTH CRISIS: AN ANALYSIS OF THE H1N1 OUTBREAK FROM AN AGENDA-BUILDING AND AGENDA-SETTING PERSPECTIVE

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The H1N1 flu pandemic was one of the most closely followed stories of 2009. This study revealed evidence of second-level agenda-building and agenda-setting correlations among U.S. government communication efforts and news media coverage, and media coverage and online discussion, respectively, regarding a set of macro-attributes used to frame the H1N1 issue. Cross-lagged analyses suggest that government-controlled information shaped the H1N1 macro-attributes emphasized in media coverage at the start of the outbreak, only to see this path of influence reverse as this public health issue matured. On the other hand, influence in the exchange of H1N1 attribute priorities among media coverage and online discussion appeared fairly balanced. The news media seemingly did not dominate how this issue was framed in online discussion. The theoretical and practical implications of these findings are discussed.

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In June 2009, after receiving confirmed cases of the H1N1 virus in 74 countries around the world, including 144 deaths, the World Health Organization declared the first flu pandemic in over 40 years (Esterl, 2009). Considering that the last declared pandemic was responsible for approximately one million deaths, the intense media, public, and government attention that converged on the issue of H1N1, also known as swine flu, was not surprising (Esterl, 2009). The H1N1 outbreak was one of the most closely followed stories of 2009, and among health issues, only the debate over health care reform was followed more closely by the public (Pew Research Center for the People & The Press, 2009). The last fast-spreading virus to have captured as much of the American public's attention was Severe Acute Respiratory Syndrome (SARS) in 2003.

From the start of the H1N1 outbreak, the White House emphasized the importance of quickly and clearly sharing information on disease control with the news media and the American people (Lee, 2009). The Centers for Disease Control and Prevention (CDC), a U.S. federal agency under the Department of Health and Human Services, served as a major provider of official information on H1N1. In addition to the information provided by official government sources, such as the CDC, and the traditional news media, the Internet, including online discussion forums, message boards, and blogs, served as sources for information and discussion regarding the H1N1 outbreak. Indeed, the public named the Internet the most useful source for learning information about H1N1, ahead of cable, local, and network evening news, newspapers, radio, and morning television shows (Pew Research Center for the People & The Press, 2009).

The H1N1 flu outbreak provides a unique opportunity to examine the relationships among government source-provided messages, media coverage, and online discussion during a major public health crisis through the theoretical lens of agenda-building and agenda-setting (McCombs & Shaw, 1972). Although the related concept of framing has been explored in the health crisis communication domain, the agenda-building and agenda-setting perspective has received scant scholarly attention in this important setting. Using a longitudinal study design, this research represents one of the first efforts to *simultaneously test* for the transfer of attribute salience, the core theoretical proposition in second-level agenda-building and agenda-setting, among the government-media agenda and the media-online discussion agenda, and to determine the direction of influence in these potential relationships, over the course of a public health crisis.

LITERATURE REVIEW

Agenda-Setting: Media Influence on the Public

The core idea of agenda-setting theory is that the mass media signals the salience of major issues to the public, and consequently affect what the public perceives as being the most important issues of the day (McCombs, 2006). In other words, the public learns the relative importance of an issue based upon the amount of attention that issue receives in media coverage. Nearly a century ago, Lippmann (1922) argued that the pictures that appear in the mind of the public are formed in large part by which topics the media choose to emphasize, de-emphasize or ignore entirely. This agenda-setting argument is perhaps best summed up by Cohen (1963), who said that the news media: "may not be successful much of the time in telling people what to think, but it is stunningly successful in telling its readers what to think about" (p. 13).

McCombs and Shaw (1972) first put the notion of an agenda-setting function of the press to an empirical test during the 1968 presidential election. In what has come to be known as the Chapel Hill study, these researchers found a very high correspondence between the amount of media coverage a set of issues received and the perceived importance of these issues among a group of undecided voters, thereby providing the initial evidence of a transfer of salience between the media and the public (McCombs & Shaw, 1972). Since this initial empirical foray, several hundred subsequent examinations have built upon and extended this work, often finding in both field and laboratory-based settings support for the proposition that the news media 'sets' the public agenda (for a review of these accumulated findings, see Dearing & Rogers, 1996; McCombs, 2005, 2006; McCombs & Shaw, 1993; Rogers & Dearing, 1988, 2000). A meta-analysis by Wanta and Ghanem (2007) of 90 agenda-setting studies conducted over a 20 year period revealed an overall mean correlation of .53 between the media agenda and the public agenda, with the majority of these studies showing statistically significant findings.

Contemporary agenda-setting research has found that the media may not only influence *what* the public thinks about an object, whether it is an issue, candidate, or organization, but also *how* the public thinks about that object (Golan, Kiousis, & McDaniel, 2007; Lopez-Escobar, Llamas, McCombs, & Lennon, 1998). Each object has numerous *attributes,* the characteristics, properties, and traits which help describe and fill out the picture of an object. As asserted by McCombs and colleagues (2000), "both the selection by journalists of objects for attention and the selection of attributes for detailing the pictures of these objects are powerful agenda-setting roles" (p. 78). Research into the transfer of attribute salience between agendas converges with the concept of framing – the use of selection, emphasis, exclusion, and elaboration to make certain aspects of a perceived reality more salient in a communication text (Entman, 1993) – and is called "second level" agenda-

setting (Ghanem, 1997; Lopez-Escobar et al., 1998; McCombs, 2006). Under this conceptualization, frames may be thought of as the macro-attributes of objects.[8] Research that tests the traditional transfer of object salience from one agenda to another is called "first level" agenda-setting (Lopez-Escobar et al., 1998; McCombs, 2006).

Agenda-setting researchers have identified two major types of attributes – substantive and affective attributes – that aid in the comprehension of mediated messages (Kiousis, Mitrook, Wu, & Seltzer, 2006). Substantive attributes are the cognitive characteristics that communicators (journalists, communication professionals, members of the public, etc.) use to describe and define objects in mediated messages, whereas affective attributes refer to the valence or tone (i.e. positive, negative, or neutral) that communicators assign to an object. For example, in the context of health communication, a mediated message, such as a news story, press briefing, or message board posting, that frames a health issue in a clearly positive or negative way would demonstrate the presence of an affective attribute, while a message that links this health issue with discussion of conflict, or provides new evidence regarding an issue, would demonstrate the presence of a substantive attribute. The current study will probe for second-level agenda-building and agenda-setting effects using a set of substantive macro-attribute frames that were previously developed and deployed to study epidemic diseases (e.g., Shih, Wijaya, & Brossard, 2008).

Agenda-Building: Who Sets the Media's Agenda?

If the media tends to set the public agenda, then who sets the media agenda? As a natural outgrowth of agenda-setting research examining the media's influence on the public agenda, a new line of inquiry into the origins and sources of the media agenda emerged in the 1980s (Gandy, 1982; Turk, 1985). Research that examines the various influences that shape the media agenda, such as the communication efforts of policymakers, corporations, and interest groups, has come to be known as agenda-building (Turk, 1985, Turk & Franklin, 1987). Within agenda-building research, the media agenda – the independent variable in traditional agenda-setting research – becomes the dependent variable, and scholars explore the various sources that influence, and are influenced by, the media agenda (McCombs, 2006).

In exploring the interplay of priorities among news sources and journalists, researchers have found that source-provided materials, known as *information subsidies* (e.g. news releases, interviews, press briefings, advertisements, speeches, etc.) can play a critical

[8]There is debate over the convergence of framing and second-level agenda-setting (see McCombs, 2006; Reese, 2007; Scheufele & Tewksbury, 2007). Resolving this debate is beyond this study's scope. The purpose of this study is to simultaneously test for second-level agenda-building and agenda-setting effects in an underexplored setting for these theories using the macro-attribute/framing conceptualization put forth by McCombs (2006).

role in building the media agenda (Cutlip, 1962; Golan et al., 2007; Kaid, 1976; Kiousis et al, 2006; Tedesco, 2001, 2005; Turk, 1985; Turk & Franklin, 1987). If information is viewed as a commodity that serves as an essential raw material in the construction of a news story, then information subsidies represent attempts to "intentionally shape the news agenda by reducing journalists' costs of gathering information" (Berkowitz & Adams, 1990, p. 723). Evidence of second-level agenda-building has been detected in a growing number of studies (e.g. Kiousis, Kim, McDevitt, & Ostrowski, 2009; Kiousis et al., 2006; Kiousis, Popescu, & Mitrook, 2007), suggesting that source-provided information subsidies can influence not just *which* issues should be covered by the media, but also *how* those issues should be framed in coverage.

However, unlike agenda-setting research, where the path of influence is fairly clear cut (generally flowing from the media to the public), the path of influence in agenda-building research between sources and the media seems to shift depending on the issue or issues, the setting, time period, and the actors involved (Gilberg, Eyal, McCombs, & Nicholas, 1980; Johnson, Wanta, & Byrd, 1995; Wanta & Foote, 1994; Wanta, Stephenson, Turk, & McCombs, 1989). The series of studies by Wanta and colleagues regarding the influence of the presidential State of the Union addresses perhaps best illustrate the fluid relationship between news sources and media coverage. For example, Johnson et al. (1995) found somewhat surprisingly that Franklin Roosevelt's addresses *reacted* to previous media coverage more than they influenced subsequent coverage. A related study revealed that addresses by Carter and Reagan were also influenced by the media agenda, while a Nixon address shaped coverage (Wanta et al., 1989). A subsequent investigation by Wanta and Foote (1994), using the Weekly Compilation of Presidential Documents, found that on some issues Bush led the media, while on other issues Bush reacted to the media. Finally, on several issues, *reciprocal influence* was detected between the communication efforts of Bush and media coverage (Wanta & Foote, 1994).

Agenda-Building and Agenda-Setting in a Health Crisis Communication Context

Although there have been hundreds of inquires exploring agenda-setting and agenda-building effects in general public affairs and political election settings, little attention has been given to these effects in a *health crisis communication setting*. In a more general health communication context, there have been several efforts to apply agenda-setting theory to health promotion research (Jones, Denham, & Springston, 2006; Pierce, Dwyer, Chamberlain, Aldrich, & Shelley, 1987; Pierce & Gilpin, 2001; Pierce, Macaskill, & Hill, 1990). Most notably, Pierce and colleagues have used agenda-setting theory to examine the mass media's role in boosting the public salience of the anti-smoking campaign message, and the impact of this message on changing smoking behavior. However, most health risk

communication research focused on selective media presentation/audience perception has used framing as its theoretical framework.

For example, several studies have focused on media framing of the Severe Acute Respiratory Syndrome (SARS) health crisis. Tian and Stewart (2005) compared how television networks CNN and BBC framed the SARS crisis in the spring and summer of 2003. These researchers found that U.S.-based CNN and British-based BBC employed different frames in their reports on SARS, due in part to differences between the U.S. and U.K. in relationships, proximities, and interests in SARS-affected areas (i.e., Mainland China, Hong Kong, Taiwan, and Toronto). CNN seemed more concerned about the economic aspect of this crisis, and focused more on what was being done to control the epidemic than did the BBC, potentially due to the cultural difference between these countries in how they perceive disease as a phenomenon.

Luther and Zhou (2005) conducted a very similar content analytic study, focusing as well on media coverage of SARS, but comparing news reports in a different set of countries – the U.S. and China. These researchers detected the usage of similar news frames – economic consequences, responsibility, conflict, and human-interest – in both countries regarding coverage of the disease. An investigation by Hong (2007) represents another example of using the framing perspective to examine news media coverage on SARS across several different types of Chinese news media outlets. This research content analyzed SARS media reports provided by a Web portal, a national newspaper, and a regional newspaper in China, finding that the Web portal emphasized the economic frame significantly more than the other two traditional news providers.

Research by Shih, Wijaya, and Brossard (2008) provides a detailed examination of media framing of several major health risk situations. These scholars analyzed coverage in *The New York Times* of mad cow disease, West Nile virus, and the avian flu. While the prominence of certain frames varied depending on the health risk issue examined, action and consequence were the two main frames that the media employed consistently in their coverage. Absent from the Shih et al. (2008) study, as well as most prior framing research analyzing coverage of health risk issues and crises, has been what effect these media frames may have on the frames used by news consumers, as well as how government-provided information may shape these media frames and vice versa. In an effort to provide a more complete view of the *precursors* and *outcomes* of framing, this current study longitudinally examines the potential transference of H1N1 attribute salience among media coverage, the government's communication efforts (CDC), and online discussion from an agenda-building and agenda-setting perspective.

Hypotheses and Research Questions

Based on the logic of second level agenda-setting and agenda-building, the following hypotheses are submitted:

H1. The salience of H1N1 attributes on the media agenda will be positively associated with the salience of H1N1 attributes on the online discussion agenda.

H2. The salience of H1N1 attributes on the government agenda will be positively associated with the salience of H1N1 attributes on the media agenda.

Based on the theorizing of second level agenda-setting and agenda-building, the following research questions are submitted:

RQ1. What is the direction of influence in the relationship among the media agenda and the online discussion agenda regarding H1N1 attribute salience?

RQ2. What is the direction of influence in the relationship among the government agenda and the media agenda regarding H1N1 attribute salience?

METHOD

For the current investigation, three separate content analyses were conducted to monitor the salience of a set of macro-attributes used to frame the H1N1 flu outbreak in news media coverage, government health communication efforts, and online discussion during this high-profile public health crisis. Each content analysis was linked by time and followed the procedure outlined by Kaid and Wadsworth (1989) for conducting a content analysis.

Sampling Process

The sample time period was six months, starting on April 23, 2009, which is the date when the CDC issued its first public comments on the H1N1 virus, and running until October 24, 2009, which is when a National Emergency was declared by the U. S. government. This six-month period was sub-divided into six equal one-month increments to facilitate the testing of the flow of influence among the government source, media, and online discussion agendas using cross-lagged correlation analysis (Roberts & McCombs, 1994; Tedesco, 2005). Previous research (e.g., Winter & Eyal, 1981) indicates that approximately four weeks is the optimum time span for detecting agenda-setting effects.

The government source agenda was constructed through a search of the online newsroom on the CDC Web site. This newsroom search revealed transcripts for 44 press briefings held on H1N1 during the sample time period. Each information subsidy (briefing transcript) was downloaded, saved, and then analyzed. Each sentence of the briefings served as the unit of analysis (n = 8,604). The sentence, rather than a larger unit of analysis, was selected to provide more intensive analysis and enhance the validity of the findings (Graber, 2004, Woolley, 2000).

To construct the media agenda, a search of the Lexis Nexis database was conducted using the keywords 'H1N1' or 'swine flu' with CNN.com and *The New York Times* as sources. These two elite media outlets were selected since they are leaders in the online news category in the United States with among the highest website traffic among news producers (Schonfeld, 2009). The use of parallel indicators to measure media salience enhances reliability, and provides internal replication opportunities (Chaffee, 1991). For the six month period, 250 CNN stories and 339 *The New York Times* stories on H1N1 were found, and each article was gathered, saved, and analyzed. In keeping with prior agenda-setting research (e.g., Kiousis et al., 2007), any materials other than hard news stories substantively concerned with H1N1 were eliminated. Consistent with the measurement of the government agenda, each sentence of the stories served as the unit of analysis (n = 4,964 for CNN and n = 5,200 for *The New York Times*).

Finally, to assess the online discussion agenda, BoardReader (www.boardreader.com), an online forum and message board search engine, was used. Developed by researchers from the University of Michigan, BoardReader simultaneously searches thousands of public discussion forums and message boards for keywords or phrases. Media effects researchers have previously monitored message boards to gauge the salience of objects and attributes in online discussion (Lee, Lancendorfer, & Lee, 2005; Roberts, Wanta, & Dzwo, 2002; Zhou & Moy, 2007). Given that this current study focused on *second-level* agenda-building and agenda-setting effects, using public opinion polling data on H1N1, which simply measured the perceived importance of this issue, but not how it was framed and discussed, was not sufficient for this level of analysis.

Using the keywords 'H1N1' or 'swine flu' revealed a total of 132,517 posts made during the six month period. Using a systematic random sampling technique (starting from a random point in the search results each month), 1,200 posts were drawn and analyzed for the six month period (200 posts for each time period). The number of posts drawn is similar to previous research (e.g., Lee et al., 2005). To remain consistent with the measurement of the government source and media content, each sentence of the post served as the unit of analysis (n = 5,039).

Coding Process

A set of macro-attributes developed and deployed in prior framing research on health epidemics (Shih et al., 2008) was used to monitor the H1N1 attribute emphases expressed by the three actors (government, media, and public discussion) during the H1N1 crisis. These six macro-attributes are: Consequence, Uncertainty, Action, Reassurance, Conflict, and New Evidence. According to Shih et al. (2008), Conflict (agreement/disagreement among news sources), Uncertainty (uncertainties in any aspects of the issue), and Reassurance (reassuring people not to worry about the issue) were included based on prior observations made by Griffin, Dunwoody, and Gehrmann (1995). Griffin et al. (1995) indicated that, during an epidemic, the government focused on minimizing loss and providing reassurance, whereas the media tended to pay more attention to the issues that have the potential to be dramatized by emphasizing crisis. New Evidence (new findings or results of research efforts for better understanding of the issue), Consequence (the impact of the issue), and Actions (how to respond to the issue) were included by Shih et al. (2008) based on Cappella and Jamieson's (1997) observations regarding the emphases placed by journalists within news coverage of epidemic situations. The six macro-attributes used for this study are outlined in more detail on Table 1.

For the purposes of this study, an attribute agenda is defined as a collection of attributes related to an object (in this case, the H1N1 outbreak) that is communicated in a hierarchy of importance at a set point in time. The hierarchy or rank-order of the attributes on each agenda is based upon the salience, or frequency of mentions, of each attribute in the content analyzed. Each unit of analysis (sentence) of briefing transcripts, news stories, and posts was coded for the presence (1) or absence (0) of the set of macro-attribute frames listed on Table 1.

Some basic demographics of each unit (e.g., date, unit type, title, source) were also recorded. Units with a date that fell within April 23 - May 22 (Time I) were assigned a '1,' and units that fell within May 23 - June 22 (Time II) were assigned a '2.' In the same manner, units within June 23 - July 22 (Time III), July 23 - August 22 (Time IV), August 23 - September 22 (Time V), and September 23 - October 24 (Time VI) were assigned a '3,' '4,' '5,' and '6.'

Intercoder Reliability

Two graduate students with previous content analysis experience were trained regarding the coding protocol. The coders were trained over several sessions by one of the primary investigators regarding the coding instructions and the operational definitions of each attribute. After a series of coding practices, the results were discussed and disagreements were analyzed and re-examined. Finally, a sub-sample of 7% of the total

Table 1. Macro-attribute frames for epidemic diseases (Shih, Wijaya, & Brossard, 2008)

Frames	Definitions
Consequence	The consequences of the diseases, such as human life (victims), social impact, or economic impact (cost), are the focus of the story. In addition to damages, it also includes any phenomenon, social/ political issues, events, or discussion generated by the occurrence or spread of diseases. For example, the discussion of flu vaccine or drugs, although indirect, is considered as a consequence of avian flu because the "talk" derives from the potential outbreak of the flu.
Uncertainty	This frame is characterized by uncertainties in any aspect(s) of the epidemics including the cause, the cure, the possible spread, etc. Also included is portrayal of the disease as something unknown that is in need of more exploration or examination by the experts or governments.
Action	The story stresses any action(s) against the disease, including prevention, potential solutions, or strategies. The ban against British beef is one example.
Reassurance	The story expresses the idea that the public should not be worried about the effects of the disease. Stories that emphasize the readiness and/or successes of authorities in combating the disease are also included.
Conflict	The story focuses on the difference in opinions as well as outright arguments/ disagreements among news sources. It could be a debate about how to effectively combat the diseases, disagreement about how diseases will evolve and how serious it will affect people, or dispute over the appropriateness or legitimacy of actions. Conflict story is constructed as antagonism between opposing opinions or stances.
New evidence	This frame refers to new findings/ results of research efforts or discovery of new evidence that help advance the understanding of the diseases or the ability to quell the diseases. Included in this frame are: discovery of new strains of the disease, new way of spreading/ transmitting, new methods to prevent/cure/treat the disease, development of new medicine, and so on.

content (press briefing transcripts, news stories, and online posts) analyzed in this study was randomly selected and recoded to establish the level of intercoder reliability. Reliability was calculated using Holsti's formula (1969) and an acceptable overall coefficient of .91 was obtained.

Data Analysis Process

Consistent with many prior agenda-setting and agenda-building studies, Spearman's rho rank-order correlations (McCombs & Bell, 1996; McCombs & Shaw, 1972) were utilized as the statistical test for the hypotheses predicting attribute agenda linkages. Cross-lagged correlations, a well-established statistical technique within the literature for suggesting influence in two variable relationships using time-ordered correlational data,

were used for the research questions, which asked about the *flow of influence* among these agendas (Lee et al., 2005; Lopez-Escobar, 1998; Roberts & McCombs, 1994; Sweetser et al., 2008; Tedesco, 2005). Rozelle-Campbell (1969) baseline statistics were calculated to determine the significance of the cross lags. The baseline represents the expected level of correlation between the agendas arising from autocorrelation and synchronous correlation (Campbell & Kenny, 1999; Lopez-Escobar et al., 1998). This baseline and six-wave design helps guard against spuriousness (Kenny, 1975).

RESULTS

The salience of the attributes used to define and explain the H1N1 issue in government communication efforts, media coverage, and online discussion is presented in Table 2. This table displays interesting similarities and differences, as well as some shifts over the course of the outbreak, in attribute salience among the three actors (government-media-online discussion). During Time I, Action was the attribute most emphasized by the government in discussion of the H1N1 issue. However, over the rest of the study time period (Time II to Time VI), Reassurance was the overwhelmingly salient attribute in government communication efforts. In contrast, throughout the six month period, online discussion of H1N1 consistently focused on the Uncertainty attribute (only in Time II was this attribute superseded by the Consequence attribute), whereas the focus of media coverage was largely consistent throughout the crisis. *The New York Times* emphasized the Consequence attribute throughout its H1N1 coverage, whereas CNN.com initially focused on this same attribute before shifting its focus to the Action aspect of the story.

Table 3 displays the correlations among the government, media, and online discussion agendas for H1N1 attribute salience based on an aggregated, cross-sectional view of the data. Hypothesis 1, predicting that the salience of H1N1 attributes on the media agenda would be positively linked with the salience of attributes on the online discussion agenda, received mixed support. This hypothesis was supported by one of the two outlets [CNN.com ($r_s = .77$, $p < .05$)].

Hypothesis 2, which expected that the H1N1 attributes on the government and media agendas would be positively associated, received solid support as the linkage with *The New York Times* was significant ($r_s = .83$, $p < .05$) and with CNN.com approached significance ($r_s = .66$, $p < .10$). Given the exploratory nature of this research, and the effect of the small number of categories ($n = 6$) on the significant test for rank-order correlations, the higher significance level of $p < .10$ is included here (Kiousis, 2005; Kiousis & McCombs, 2004; Kiousis et al., 2009).

Table 2. Frequency of attribute mentions (and ranks) for the six month time period

		Time I	Time II	Time III	Time IV	Time V	Time VI	Aggregate
Government	Consequence	680 (2)	83 (2)	49 (2)	41 (2)	27 (2)	121 (2)	1,001
	Uncertainty	512 (4)	15 (4)	14 (3)	27 (3)	19 (4)	86 (3)	673
	Action	**771 (1)**	36 (3)	7 (4)	9 (4)	20 (3)	40 (4)	883
	Reassurance	647 (3)	**126 (1)**	**107 (1)**	**181 (1)**	**131 (1)**	**449 (1)**	1,641
	Conflict	8 (6)	0	0	1 (5)	0	1 (6)	10
	New Evidence	193 (5)	0	0	0	0	11 (5)	204

		Time I	Time II	Time III	Time IV	Time V	Time VI	Aggregate
Media (CNN.com)	Consequence	**829 (1)**	**58 (1)**	**83 (1)**	69 (2)	113 (2)	59 (5)	1,211
	Uncertainty	377 (3)	17 (3)	49 (3)	40 (3)	66 (3)	64 (4)	613
	Action	398 (2)	15 (4)	60 (2)	**89 (1)**	**193 (1)**	**194 (1)**	949
	Reassurance	154 (5)	19 (2)	11 (5)	15 (5)	36 (5)	91 (2)	326
	Conflict	42 (6)	1 (6)	5 (6)	9 (6)	11 (6)	25 (6)	93
	New Evidence	159 (4)	6 (5)	24 (4)	21 (4)	39 (4)	66 (3)	315

		Time I	Time II	Time III	Time IV	Time V	Time VI	Aggregate
Media (*New York Times*)	Consequence	**635 (1)**	**251 (1)**	**112 (1)**	**94 (1)**	**97 (1)**	**112 (1)**	1,301
	Uncertainty	126 (3)	12 (4)	8 (5)	15 (4)	37 (4)	55 (3)	253
	Action	176 (2)	19 (3)	9 (4)	58 (3)	62 (2)	91 (2)	415
	Reassurance	50 (4)	25 (2)	39 (2)	79 (2)	46 (3)	52 (4)	291
	Conflict	18 (6)	2 (5)	10 (3)	0	7 (6)	16 (6)	53
	New Evidence	41 (5)	0	3 (6)	2 (5)	25 (5)	23 (5)	94

		Time I	Time II	Time III	Time IV	Time V	Time VI	Aggregate
Online Public	Consequence	104 (2)	**152 (1)**	150 (2)	71 (3)	204 (2)	144 (2)	825
	Uncertainty	**130 (1)**	149 (2)	**151 (1)**	**202 (1)**	**245 (1)**	**273 (1)**	1,150
	Action	31 (3)	52 (3)	43 (3)	87 (2)	73 (3)	110 (3)	396
	Reassurance	8 (4)	4 (6)	4 (5)	12 (4)	10 (5)	20 (5)	58
	Conflict	7 (5)	9 (5)	4 (5)	5 (6)	2 (6)	23 (4)	50
	New Evidence	5 (6)	15 (4)	7 (4)	7 (5)	28 (4)	15 (6)	77

Notes:
Aggregate = Time I - Time VI
Time I = April 23 - May 22, 2009
Time II = May 23 - June 22, 2009
Time III = June 23 - July 22, 2009
Time IV = July 23 - August 22, 2009
Time V = August 23 - September 22, 2009
Time VI = September 23 - October 24, 2009

The two research questions moved beyond testing for second-level agenda-building (government-media) and agenda-setting (media-online discussion) associations based on an aggregated view of the data, and into inferring the possible path of H1N1 attribute influence between each pair of agendas as the issue developed *over time* (Time I – Time VI).

Table 3. Correlations among government communication efforts, media coverage, and online discussion for H1N1 attribute salience for the six-month time period

	Government	Media (CNN.com)	Media (*New York Times*)	Online Public
Government	1.00			
Media (CNN.com)	.66#	1.00		
Media (*New York Times*)	.83*	.94**	1.00	
Online Public	.26	.77*	.54	1.00

Notes: #$p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$

Government = attribute agenda as articulated in CDC press briefing transcripts.

Media = attribute agenda as articulated in CNN.com or *New York Times* news stories

Online Public = attribute agenda as articulated in message board/discussion posts.

The six waves of measurement allowed for five cross-lagged correlation analyses per pair. The first research question asked how the salience of H1N1 attributes in media coverage and online public discussion may have shaped each other. This flow of influence is shown in Figure 1, with evidence of significant influence among the agendas indicated by thick, bolded arrows.

This figure reveals that the correlation of .886 between CNN.com coverage at Time I and the online discussion agenda at Time II is stronger than the reverse time order correlation (.657). However, both of these correlations exceeded the Rozelle-Campbell baseline value of .358, thereby suggesting some degree of reciprocal influence (*bidirectional*) between CNN.com and online discussion during the Time I - Time II period. On the other hand, during the Time II - Time III period, the correlation of .886 between online discussion at Time II and CNN.com at Time III is stronger than the reverse time order correlation (.435). The former correlation exceeded the baseline of .484, while the latter correlation fell below this value. Therefore, this analysis suggests that the online public agenda *unidirectionally* shaped CNN.com coverage during the Time II - Time III period. Following this same process for the other comparisons suggests that CNN.com coverage led online discussion during the Time V - Time VI period, and in turn, discussion led coverage over the Time II - Time III period. For the remaining two comparisons (Time III - Time IV, and Time IV - Time V), reciprocal influence was again suggested. Moving on to *The New York Times*, reciprocal influence was indicated between coverage and online discussion during Time I – Time II, coverage led Time II – Time III, and discussion led for the final three cross-lags (Time III – Time IV, Time IV – V, Time V – Time VI). Overall, this analysis suggests that the media spent more time following, rather than leading the online discussion, regarding H1N1 attribute salience. The media did not dominate the framing of this issue – at least among posters to online message boards and discussion boards.

The second research question asked about how H1N1 attribute salience in government communication efforts and media coverage shaped each other. The results of this analysis

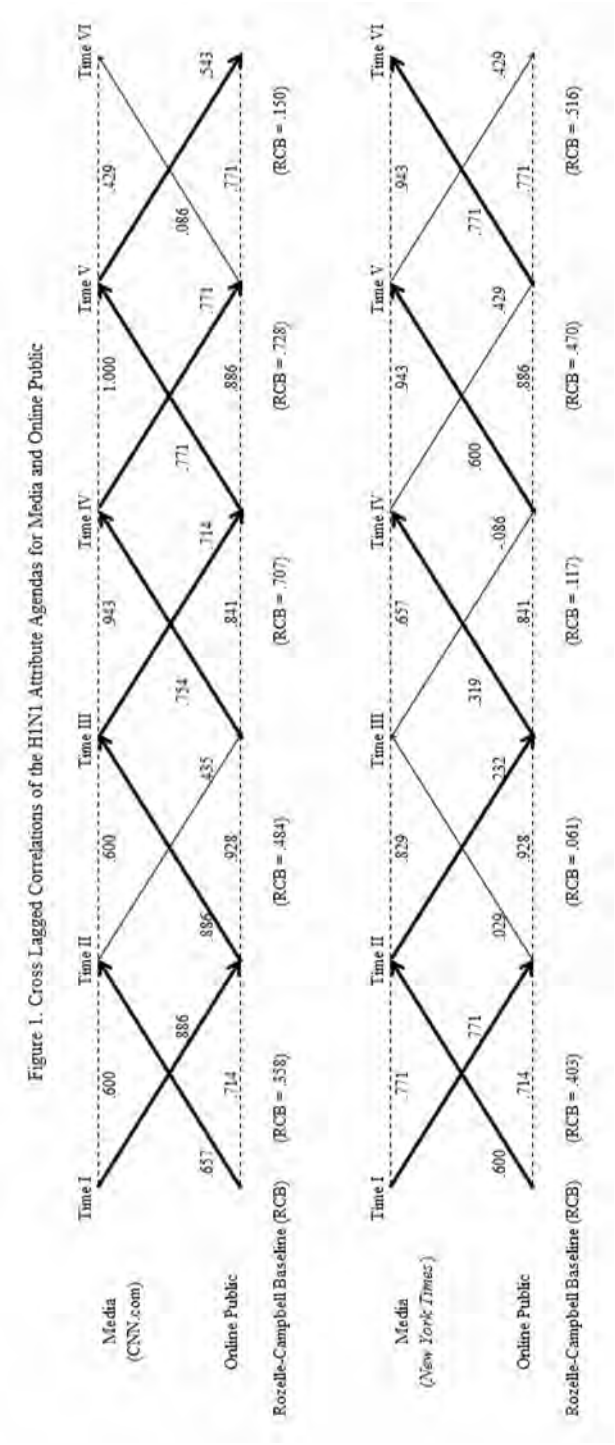

Figure 1. Cross Lagged Correlations of the H1N1 Attribute Agendas for Media and Online Public

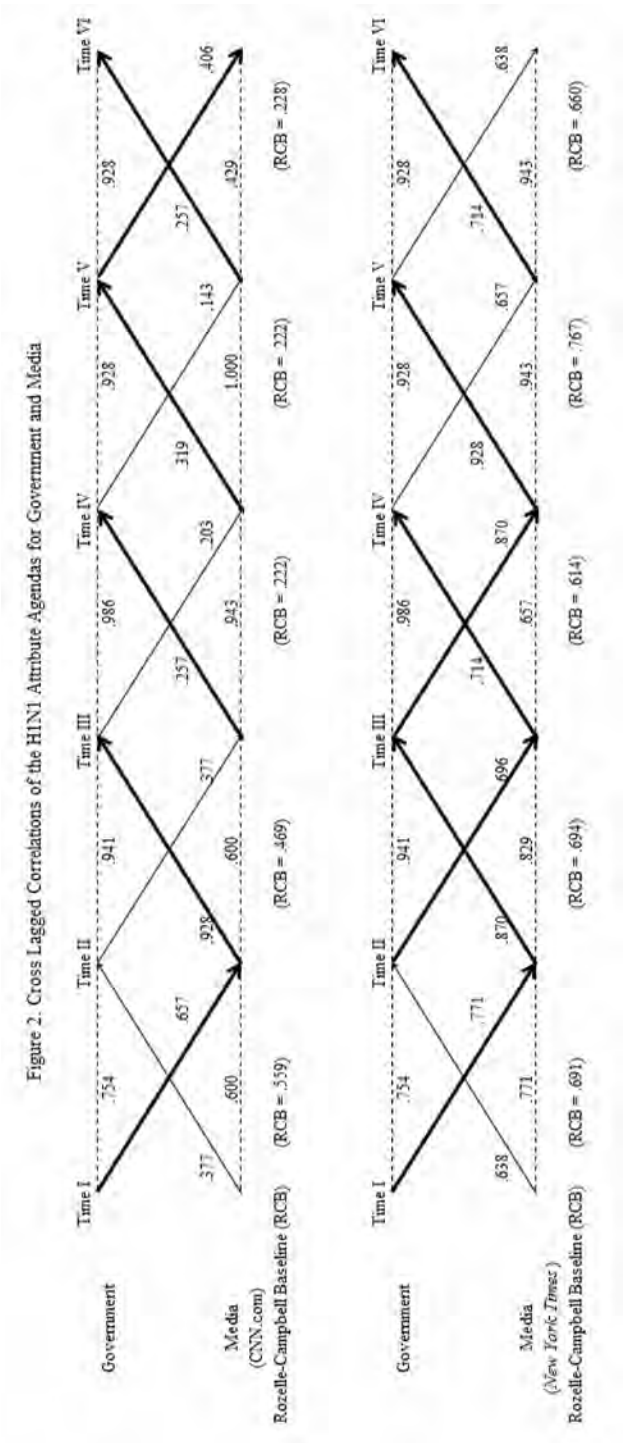

Figure 2. Cross Lagged Correlations of the H1N1 Attribute Agendas for Government and Media

are shown in Figure 2, with evidence of significant influence again indicated by thick, bolded arrows.

For both the CNN.com and *The New York Times* comparisons, this figure suggests that government communication efforts undirectionally influenced how these two media outlets covered H1N1 in the Time I - Time II period. However, that seemingly marked the extent of the government's unidirectional building of the media agenda. As the H1N1 issue matured, this flow of influence reversed with the media largely leading how the government discussed this issue. As Figure 2 indicates, CNN.com coverage led the government attribute agenda from Time II through Time V. Finally, during the Time V - Time VI period, evidence of reciprocal influence was detected. Turning to *The New York Times*, the cross-lags suggest reciprocal influence Time II through Time IV, followed by coverage taking the lead Time IV through Time VI. Overall, this analysis suggests that the media was the dominant actor in this relationship.

Discussion

As hypothesized, significant positive linkages were generally found between media coverage and government communication efforts, and media coverage and online discussion regarding the hierarchy of attributes used to frame the H1N1 issue during the first six months of this crisis. Cross-lagged correlation analyses suggested that the H1N1 attribute agenda of the news media predominantly shaped the government agenda for all except the first two months of this crisis, while influence among the media and online discussion was fairly balanced, with online message board posters leading this exchange more often than not. The dynamic influence detected in this study would not have been possible using a static cross-sectional design.

While the overall attribute agendas were generally linked, the attributes at the top of each agenda *were not* identical. The government stressed the Reassurance attribute; the Uncertainty attribute was the most salient in online discussion; and the Consequences attribute was predominant across the media coverage analyzed. The top attributes detected among these three actors on this issue are consistent with the work of Beck (1992) and Gidden (1990). These sociologists suggest that, in a bid to maintain public confidence, the government tends to exaggerate its ability to control a risk situation; the media may dramatize the risk as more dangerous and consequential than it actually is, while the public may in turn show declining confidence in the government and heightened concern (Beck, 1992; Gidden, 1990). Some communication scholars have found similar patterns (Bennett, 2001; Shih et al., 2008).

Upon reflection, the finding that government communication efforts only exerted influence on H1N1 attribute emphases in news coverage at the *start* of the outbreak, with the media then taking the lead as the issue developed, is not all that surprising. During the

early phase of a crisis, official sources, such as the government, enjoy an advantage since journalists are still in the discovery phase of news gathering (Steele & Hallahan, 1998). As elaborated by Wilcox and Cameron (2010), "if much of this crucial information comes from official spokespersons of organizations, it's an opportunity for public relations to shape the tone and content of a story, to put a particular emphasis on a story" (p. 221). As it relates to the H1N1 issue, as this situation evolved and time passed, journalists likely found themselves with a much broader menu of experts to choose from for gleaning information on this virus, and less reliant on the government perspective. Conceivably, the government may have planned from the start to shift its focus after the initial wave of coverage to *responding* to the attributes stressed by the media. In other words, the government played *agenda-responder*, rather than *agenda-builder*.

While the seemingly limited influence of the government on media framing of the H1N1 issue was not all that surprising, the generally balanced give-and-take between the media and online discussion regarding *how* they discussed the H1N1 issue was more unexpected. Agenda-setting scholarship analyzing traditional media coverage and public opinion has generally found a *unidirectional* influence of the mass media on the priorities of the public, although there have been exceptions (e.g., Smith, 1987). In the current study, out of ten possible comparisons (two media sources x five cross-lags apiece), bidirectional influence was suggested in four cases and a unidirectional influence of online discussion on subsequent coverage was suggested in four cases. Only in two instances did coverage seem to lead, or set, the online discussion agenda. Interestingly, at least one prior study conducted in a very different setting (the 2000 general election in Korea), but which also incorporated online discussion, yielded a similar finding (Lee et al., 2005). While Korean media coverage was found to have influenced *which* election issues were talked about the most on Korean message boards (i.e., first-level agenda-setting), discussion of candidate image attributes on these boards seemingly shaped *how much* emphasis these attributes received in subsequent coverage (i.e., second-level agenda-setting).

Traditionally, journalists have been fairly isolated from the public, primarily interacting for the most part with their peers in the media and official sources. As explained by Neuman (1992), "journalists communicate with an audience they cannot see or hear. It is a one-way conversation. They operate in a professional world inhabited mainly by many news sources, public relations specialists, and other journalists" (p. 3). This wall between press and public may be breaking down to some extent as journalists increasingly participate with the public on various social media platforms. For example, recent research indicates that the vast majority of reporters now use social media to research stories (Bulldog Reporter & TEKgroup, 2010). New research also indicates that a similarly strong majority of journalists believe that bloggers have become important opinion shapers (McClure & Middleberg, 2011). Given this backdrop, more instances of bidirectional influence on the

framing of some issues does not seem unreasonable, and has been alluded to as a potentiality for at least a decade (e.g., Chaffee & Metzger, 2001).

This study makes several meaningful theoretical and practical contributions. Most prior agenda-building and agenda-setting research has been regarding general public affairs issues, often in political election settings. By detecting the presence of agenda-building and agenda-setting effects among actors during a public health crisis, this study importantly tests the extent of the *scope* and *generality* of agenda-building and agenda-setting theory as a whole. More specifically, this investigation contributes to the ongoing explication of second-level agenda-building and agenda-setting effects (i.e., the transfer of attribute salience) and the temporal dynamics of this process – outside of the theory's traditional confines. This study's detection of a fairly balanced exchange between the media and online discussion regarding H1N1 attribute salience raises intriguing theoretical questions about mediated influence at the second-level in online environments, particularly since at least one prior study has yielded similar findings (Lee et al., 2005). Replications are needed to determine if this reciprocal influence is largely an anomaly or, if on select issues and among select audiences, perhaps due to the enhanced "voice" that social media gives aspects of the public, the prioritization of issue attributes has become a more level playing field that can be shaped in part by online discussion. Until empirical evidence suggests otherwise, we should not assume that in all cases the media dominates both *which* issues people talk about online, as well as *how* they talk about them.

Shifting to practical implications, this study's findings suggest that government health communication efforts may have the greatest persuasive impact on the mass media near the *start* of a health crisis situation. Further, the interlocking agenda relationships detected in this investigation provide another reason why health communication professionals should consider investing in social media monitoring technologies to gauge the opinion of active online citizens, such as message board posters and bloggers. Simply monitoring traditional news media coverage is not enough. Given that the media agenda seemed to be shaped at least in part by the attributes emphasized in online discussion of the H1N1 issue, monitoring such discussion could provide practitioners with not only a rough gauge of the opinion on an issue among high-involvement, vocal online citizens, but also early insights into how news media framing of an issue may shift. With this knowledge in hand, professionals may be better prepared for inquiries from reporters and faster to respond to emerging citizen concerns.

Several limitations should be taken into account when evaluating these findings. Most notably, the online discussion agenda measure used in this study is not necessarily representative of *mass public opinion* on the H1N1 issue. The very act of posting to an online message board or discussion forum suggests that these citizens are fairly highly-involved and active on the H1N1 issue, which could result in these individuals framing the issue differently than the lower-involvement general public, and potentially being *less*

susceptible to media influence. There is also the risk that the elite media outlets selected to measure media salience are not fully representative of H1N1 coverage as a whole, although research has shown that coverage of issues across outlets are often strikingly similar (Dearing & Rogers, 1996; McCombs, 2006). For example, in this study, a robust second-level inter-media agenda-setting bond (r_s = .94, p < .01) was found between CNN.com and *The New York Times* regarding H1N1 attribute salience.

There are several promising avenues for future research into public health issues and crises from an agenda-building and agenda-setting perspective. In addition to replications using other health issues, future scholarship should explore these effects using different time lags, additional media and information subsidy types, and online discussion on additional social media channels. Researchers should explore whether additional variables, such as real-world cues – objective measures of the severity or risk of a social problem (reported illnesses, deaths, etc.) – have an effect on the source-media and media-online discussion relationships in this setting (Dearing & Rogers, 1996). Experimental research is needed to get more definitively at causation.

In closing, this study demonstrates the efficacy of using agenda-building and agenda-setting theory to trace the transfer of attribute priorities among government communication efforts, media coverage, and online discussion for a major public health issue. It is hoped that this study can spark additional research that further plumbs the depths of these relationships.

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THE MEDIATING ROLE OF MESSAGE ENGAGEMENT IN THE EXTENDED PARALLEL PROCESS MODEL

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Although fifty years of research has yielded mixed results, fear appeals remain one of the most common strategies to modify behavior in public health campaigns. The Extended Parallel Process Model, the most recent model to describe how, why, and under what circumstances fear appeals work, posits that when individuals see a fear appeal, they first evaluate the severity of the threat and their susceptibility to it. If both are considered moderate to high, they then judge the efficacy of the recommended response by asking, first, how well it works (response efficacy) and second, if they can perform it easily (self-efficacy). If both threat and efficacy are rated highly, the appeal is considered effective and behavior change is likely. But, if the threat is too severe, individuals will not move on to a judgment of the recommended remedy and the message will be ignored. Capitalizing on the H1N1 flu pandemic, this study examined the role of message engagement in the EPPM model. After exposing 180 subjects to an H1N1 fear appeal, evaluations of the threat, efficacy and engagement of the message, as well as intentions of making behavioral change (e.g. likelihood of getting vaccinated, protective behaviors, talking to others) were self-reported. The results show that message engagement mediates the relationship between a fear appeal's threat and efficacy and subsequent behavioral intentions. Previous research has shown

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that fear appeals are ineffective when they are too fearful, but these results suggest that if a message is emotionally engaging, it can be extremely fearful and still be effective in eliciting behavioral intentions. Practical and theoretical implications are discussed.

Keywords: Extended Parallel Process Model, engagement, fear appeals, H1N1, emotion

Despite 50 years of fear appeals research, scholars remain uncertain about exactly how and under what specific circumstances fear appeals lead to behavioral change (Nabi, Roskos-Ewoldsen, & Dillman Carpenter, 2008). While some studies substantiate the effectiveness of fear appeals (e.g., Beck, 1984, Insko, Arkoff, & Insko, 1965; Stainback & Rogers, 1983), others demonstrate their ineffectiveness (e.g., Janis & Feshbach, 1953; Kohn et al., 1982; Krisher, Darley, & Darley, 1973) and still others document mixed results (e.g., Hill & Gardner, 1980, Rogers & Mewborn, 1976, Witte, 1992). In Witte's (1992) Extended Parallel Process Model, Leventhal's (1970) parallel process model and Rogers' (1975) protection motivation theory, emphasis is placed on the relationship between and relative weighing of the severity and susceptibility of the threat and the efficacy of the recommended response. While most fear appeals research suggests that the variables identified in these models are integral to fear appeal effectiveness (Nabi, Roskos-Ewoldsen, & Dillman Carpenter, 2008), no model of fear appeals containing only threat and efficacy has been endorsed as accurately capturing the process of fear's effects on decision making without considering other characteristics of the message or audience (Eagly & Chaiken, 1993; Mongeau, 1998; Roskos-Ewoldsen, Yu & Rhodes, 2004; Witte & Allen, 2000). This research is interested in how the emotions of fear and hope impact one such characteristic, the engagement of the message itself, and how engagement in turn influences a fear appeal's effectiveness within the context of the EPPM model.

Literature Review

Fear Appeals

The effectiveness of fear appeals has been observed in a variety of public health campaigns, including drinking and driving, condom use and smoking (Perloff, 2003). Some studies have shown a positive linear relationship between fear and attitude, behavioral intention and behavioral change (Nabi, Roskos-Ewoldsen, & Dillman Carpenter, 2008; Sutton, 1982) while others have shown a curvilinear relationship where, if the level of fear

is raised too high, the message will be rejected (Witte, 1994; Witte & Allen, 2000). Although fear appeals induce a wide variety of emotions, fear may not always be most powerful or effective (Xiaoli, 2009; Timmons & van der Wijst, 2007). Research has shown that message-induced emotions are highly related to persuasion and other attitudinal measures, which may or may not lead to behavioral outcomes (Dillard & Peck, 2000; Dillard et al. 1996; O'Keefe, 2002; Stephenson, 2003; Witte & Allen, 2000), and message-induced emotions may also influence behavioral intent directly (Botta et al. 2008; Smith et al., 2008).

Several reviews of past research on fear appeals can be found in the literature (e.g. Leventhal, 1970; Witte, 1992; Nabi, Roskos-Ewoldsen, & Dillman Carpenter, 2008). Dillard (1992) outlined three stages in the development of fear appeal theories and modeling: the drive models (Hovland et al., 1953; Janis, 1967; McGuire, 1968, 1969), the parallel response model (Leventhal, 1970, 1971) and the expectancy value theories (Rogers, 1975, 1983; Sutton, 1982). Initially, approaches to fear appeals focused on the motivational aspects of fear, which was conceptualized as a drive state motivating people to overcome an unpleasant feeling by performing a recommended action or behavior (Hovland, Janis, & Kelley, 1953; Janis & Feshbach, 1953, 1954; Nabi, Roskos-Ewoldsen, & Dillman Carpenter, 2008). Janis (1967) argued for an inverted U-shaped relationship between fear and message acceptance, where some fear was necessary to create tension and motivate action, but too much would result in defensive avoidance (Janis, 1967; Witte, 1992). The central tenet of these models was that the recommendation in the message that reduced fear of the threat the most would also be the most likely to be adopted, but subsequent analyses provided little empirical support for this theory (Witte, 1992).

Using this early research, Leventhal (1970, 1971) expanded upon what he thought was an overreliance on emotional process by developing the parallel processing model (PPM), which separated the motivational from the cognitive aspects involved in processing fear appeals (Nabi, Roskos-Ewoldsen, & Dillman Carpenter, 2008; Witte, 1992). He argued that individuals exposed to a fear appeal will engage in one of two processes – fear control or danger control, and that behavior in line with a fear appeal's recommendations resulted from an individual's attempts to control the danger or threat, not their emotion.

If a response to a fear appeal is guided by fear, fear control processes will be initiated and lead to maladaptive behaviors such as denial, dismissal or source denigration, but if one responds to the threat and not a fear of it, danger control processes will be initiated and the message's recommendations for combating the threat will likely be adopted (Leventhal, 1970; Witte, 1992).

Although Leventhal's (1970, 1971) PPM provides a general theoretical outline for maldaptive and adaptive behavior resulting from exposure to a fear appeal, it cannot predict under what circumstances and because of which message characteristics each process was initiated (Witte, 1992; Nabi, Roskos-Ewoldsen, & Dillman Carpenter, 2008).

In an extension and reformulation of PPM, Rogers (1983) developed the protection motivation theory (PMT), which differentiates between maladaptive threat appraisal and adaptive coping appraisal responses by attributing message acceptance to the relationship between the severity and susceptibility of the threat and both the efficacy of the recommended response and the ease with which it could be performed (Rogers, 1983, Witte, 1992). He posited that increases in response and self-efficacy would increase the chances of the message's being accepted, but individuals would not accept the message and perform the recommended response if they thought rewards of the maladaptive behavior outweighed the severity of the threat and their susceptibility to it. Given the poor empirical support for relationships among severity, susceptibility, response and self-efficacy and Rogers' (1983) disproportionate attention to the cognitive aspects of a fear appeal (Dillard, 1992), Witte (1992) subsequently introduced the Extended Parallel Process Model.

The Extended Parallel Process Model

The Extended Parallel Process Model (EPPM) is the most recent theory to explain how, when, and under what circumstances fear appeals work (Witte, 1992, 1994, 1998; Witte & Allen, 2000). The EPPM is a dual process model consisting of cognitive responses and affective reactions and has been used to study a variety of topics from skin cancer and HIV/AIDS to genital warts and tractor safety (Gore & Bracken, 2005). Extending Leventhal's (1970) parallel process model and elements of Rogers' (1975) protection motivation theory, it suggests that the ability of a fear appeal to initiate behavioral change rests upon a subject's appraisal of the threat (e.g., H1N1 pandemic) and his or her judgment of the efficacy of the recommended response to combat the threat (Witte, 1992, 1994; Siu, 2008).

When people are exposed to fear appeal messages, they make two cognitive judgments. They first evaluate the perceived threat. If the threat is considered moderate to high, fear is induced and they move on to the second evaluation of the efficacy of the recommended response (Witte, Meyer, & Martell, 2001).

Perceived threat, an individual's thoughts and feelings about a threat, is distinguished from actual threat, a danger that exists in the environment. It consists of perceived severity—an individual's beliefs about and feelings toward the magnitude of the threat—and perceived susceptibility, which is an individual's estimate of the likelihood of experiencing the threat (Witte, 1994). Perceived efficacy consists of response and self-efficacy, and is defined as, "…the effectiveness, feasibility, and ease with which a recommended response impedes or averts a threat" (Witte, 1994, p. 114). Self-efficacy refers to an individual's ability to perform the recommended response (e.g. "I can easily get the vaccine") while response efficacy refers to if and how well the response will work in combating the threat (Witte, 1994).

According to the EPPM, the two appraisals will follow one of two paths, danger control or fear control, and result in one of three outcomes: no response, message acceptance, or message rejection (Witte et al. 2001; Gore & Bracken 2005). Danger control processes are primarily cognitive and are initiated when individuals perceive both the threat and the recommended response's efficacy as high. People fear the threat, yet are motivated and feel empowered to respond according to the danger posed by the threat and not their fear of it (Witte, 1994; Morrison, 2005; Gore & Bracken, 2005). Research (e.g., Gore & Bracken, 2005) suggests that danger control is the most effective response because individuals are more likely to respond rationally without overrelying on emotions. Danger control processes are preceded by cognitive mediation processes known as protection motivation, which involves arousing, sustaining and directing a person's activity to proceed towards danger control actions (Rogers, 1975, p. 98). Protection motivation is often internalized as respondent intentions, such as self-protective behaviors and precautionary measures to avoid health threats, such as getting the H1N1 vaccine (Rogers, 1983).

However, when perceived threat is high but perceived efficacy is low, a different process occurs. When people believe they cannot perform the message's recommended response or that it does not work, fear control processes are initiated and the message will either be ignored or rejected (Witte, 1994). In the fear control process, individuals perceive the message as threatening, yet believe they are powerless against the threat (Morrison, 2005). Research suggests that when this occurs, the message is ineffective because individuals are not motivated to take action to prevent the threat but rather employ defensive motivation processes to cope with the fear (Witte, 1994; Morrison, 2005; Gore & Bracken, 2005). These "maladaptive responses," which include denial, dismissal and talking to others, are defensive mechanisms to combat a threat perceived as too severe to overcome (Witte, 1992).

Prior research on EPPM has generally shown that for danger control processes to be initiated and the message accepted, it must have an adequate dose of fear and even greater evocations of efficacy (Gore & Bracken, 2005). While fear and threat impact the potency of response to the fear appeal, efficacy ensures acceptance of the message and resulting behavioral intentions and outcomes. In high-efficacy messages, individuals will switch between danger and fear control based on the evaluation of the threat, but if a message is considered too threatening or severe, it will be rejected.

Positive associations between message acceptance and behavioral intention variables and both severity and susceptibility, as well as response and self-efficacy, have been documented (Witte, 1992). However, the lack of support for an interaction between threat and efficacy suggest that, contrary to tenets of the EPPM, the severity and susceptibility of the threat may not be contingent upon the efficacy of the recommended response (Roskos-Ewoldson et al., 2004; Witte & Allen, 2000). There may be other conditions under which

a fear appeal can be more effective depending on other message or audience characteristics. This research seeks to determine if one such characteristic is the engagement of the message.

Engagement

A burgeoning body of scholarship around engagement has emerged across various disciplines, where it is considered essential for success in learning, sales, viewership, and exposure. With the recent surge of new media outlets as well as the sophistication of existing ones, engagement has gained much attention in the media industry, lending itself to a variety of company and organizational initiatives in advertising, television, and the internet. Because it is a relatively new construct, there is much disagreement between scholars and industry professionals about how exactly engagement should be defined and put into practice. Depending on the context of study, the construct of engagement may have many underlying concepts, and in a Web 2.0 world, it has become increasingly important to understand how people become engaged, especially in spreading health messages.

Recently, the Advertising Research Foundation (2008) formulated a broad, overarching definition of engagement to be used industry-wide. They defined the concept as "'turning on a prospect to a brand idea enhanced by the surrounding context'" (Advertising Research Foundation, 2008). Askwith (2003) defined engagement as behaviors, attitudes and desire toward a particular object. There are many other definitions and methods of assessing engagement in the literature, and scholars and industry professionals alike are continuing to solidify its definition using various dimensions ranging from attention, memory, and recall to exposure to stimuli through repeat page visits and meaningful connections with a particular brand (Angel, 2008; Chasin, 2008; Driven, 2008; Smith & Gevins, 2004).

Previous studies and their findings concerning engagement can be understood within three overarching paradigms: behavioral, emotional, and cognitive (Cunningham, Hall, & Young, 2006; OMD, 2006). In their study of the ways in which anti-smoking tobacco ads engage teenagers, Terry-McElrath et al. (2005) found that because they provoke thought and discussion, anti-smoking ads that incorporate individual testimonials and negative images and themes are more effective at engaging youth than pharmaceutical ads. These findings may be applicable to other health messages that attempt to elicit recommended behavioral outcomes. Regarding engagement and its relationship to multi-media presentations for educational purposes, Webster and Ho (1997) found that in order to elicit engagement, the presentation should be challenging, allow for feedback, and have variety. A message is engaging when it holds a listeners' attention and motivates through "intrinsic rewards" (Webster & Ho, 1997, p. 64). However, engagement is frequently mistaken for the related concept of flow. Therefore, based on these findings, it can be extrapolated that recommended behaviors presented within health messages (e.g., hand washing) could be

used to engage viewers because of the rewards that result from the practice of such behaviors (e.g avoiding sickness). Finally, Cunningham, Hall, and Young (2006) studied viewers of the various MTV networks and found that viewers are most engaged when they pay attention to the entire program and experience an emotional connection with content. Within a health communication context, these findings suggest that health messages should include content that elicits viewer emotions, such as fear and/or hope, in order to engage their audiences.

While previous studies have assessed engagement within a variety of contexts and with different measurements, the role of engagement has yet to be studied in the context of fear appeals or the Extended Parallel Process Model. Specifically, this study explores how engagement functions as a possible mediator between a fear appeal's threat and efficacy and resultant behavioral outcomes.

RESEARCH QUESTIONS

According to the EPPM, when fear is too high, viewers of a message do not move on to an evaluation of the efficacy of the health message because they feel hopeless against the threat (Witte, 1994). This research thus originally proposed that the addition of a hopeful message to an overly fearful message would allow respondents to overcome defensive motivations and move on to protective motivation without sacrificing the effectiveness of fear:

> *RQ1*: For adults, controlling for Internet health usage, perceived health issue knowledge, and previous exposure to the virus (H1N1), what is the relationship between fear appeals (fear-fear and fear-hope) and the level of engagement?

> *H1*: A dual fear-hope message will result in higher engagement for respondents than a dual fear-fear message.

Questions pertaining to the relationship between each of the elements of the EPPM (perceived threat, perceived efficacy, severity, susceptibility, response efficacy, self-efficacy) and message engagement were then proposed:

> *RQ2*: For adults, controlling for message engagement, what is the relationship between perceived threat and behavioral outcomes?

> *RQ3*: For adults, controlling for message engagement, what is the relationship between perceived efficacy and behavioral outcomes?

RQ4: For adults, controlling for message engagement, what is the relationship between severity and behavioral outcomes?

RQ5: For adults, controlling for message engagement, what is the relationship between susceptibility and behavioral outcomes?

RQ6: For adults, controlling for message engagement, what is the relationship between self-efficacy and behavioral outcomes?

RQ7: For adults, controlling for message engagement, what is the relationship between response efficacy and behavioral outcomes?

METHOD

Using the Extended Parallel Process Model as a theoretical framework, the study manipulated health messages pertaining to the H1N1 pandemic to examine how fear appeals impact user cognitions to motivate health actions. In June 2009, the World Health Organization (WHO) declared that a new strain of swine-originated flu virus was responsible for the 2009 flu pandemic, with nearly 30,000 confirmed cases worldwide (World Health Organization [WHO], 2009a). According to the organization, a pandemic consists of the emergence of a new disease to the population and viral or bacterial agents that spread easily and sustainably infecting humans and causing serious illness (WHO, 2009b). The worldwide spread of the H1N1 virus has been considered the first pandemic declared at the highest threat level since 1968 (WHO, 2009c). Capitalizing on this far-reaching and pervasive health issue, the goal of this study was to examine the role of engagement in the relationship between the severity and susceptibility of the threat of the H1N1 pandemic and behavioral outcomes such as vaccination intent, self-protective behaviors and talking to others after exposure to a fear appeal. The study was designed as a between-subjects experiment examining the effect of fear and hope and their relationship to engagement and behavioral outcomes. Manipulation checks from the questionnaire found that fear and hope were not statistically significant ($p > .10$), so the study moved on to correlational analyses to explore engagement as a mediator between the independent variables of perceived threat, perceived efficacy, severity, susceptibility, response efficacy and self-efficacy and the dependent variable of behavioral outcomes.

Participants

Undergraduate students from a major Northeastern university enrolled in introductory communication courses in the fall of 2009 were recruited to participate in the study via e-

mail and offered a nominal amount of extra credit for their participation. Those who chose not to participate in the study were offered an alternative assignment. Students were told that a study assessing their opinions of health PSAs would be conducted. Those interested in participating in the study were directed to the management website for their course, where they were randomly assigned to one of the two conditions and accessed the questionnaire.

Eleven respondents chose not to move forward with the questionnaire. The total sample size for the study was 180 respondents for both conditions. Respondents ranged in age from 18 to 24 (M = 19.9), with eighty-two percent female (n = 147) and 18% male (n = 33), consistent with the gender breakdown of the university's communications program. Most respondents (86.7%) identified themselves as White/Caucasian (n = 156), while 5% percent identified themselves as African American, six percent Asian, one percent Hispanic, and two percent as Other race/ethnicity. Eighty-eight percent of respondents (n = 158) were communication majors, 7% were business majors (n = 13), and 5% (n = 9) were from other disciplines. Of the 180 respondents, 91% (n=164) reported using the Internet to obtain health information, 69% (n = 124) reported using television news, 50% (n = 91) reported using newspapers, 39% (n = 70) reported using magazines, 5% (n = 9) reported using the radio, and 7% (n=12) reported using other media for their health information. Respondents considered themselves to be moderately knowledgeable about general health issues (M = 3.06; SD = .77) and the H1N1 virus (M = 4.28; SD = 1.83), and reported spending about 10 hours per week online (M = 14.6, SD = 11.9).

Independent Variables

To examine the influence of a hopeful message on the engagement of fear appeals, two H1N1 PSAs were created and manipulated for the study: a PSA with both a fearful and hopeful message and a PSA with only a fearful message. The first thirty seconds of both public service announcements were identical with a black-and-white video comparing the casualties of World War I with those of the flu pandemic of 1918, with bold text reinforcing the number of casualties. After thirty seconds, the fear and hope PSA featured a series of young children promoting self-protective behaviors to fight the H1N1 flu virus ("*Wash your hands with soap and water*," "*Cover your mouth when you cough*," and "*Use hand sanitizer*.") These self-protective behaviors were also reinforced with bold text. In the fear-only message, a black screen appeared at the thirty second mark displaying the number of casualties of the U.S. War on Terror and the H1N1 flu pandemic. The second scrolling scene began with the question "Are you convinced yet?" and featured additional H1N1 information about the number of reported states with widespread flu statistics. Both versions ended with a similar recommendation to obtain the H1N1 flu vaccine.

Manipulation Check.

Fear appeals are commonly defined according to the level of fear, with high fear appeals being significant more effective than low fear appeals (Witte, 1992). The amount is fear is determined through a manipulation check. Three manipulation checks were pretested with different respondents than those who participated in the actual study to assist in determining the validity of the fear and hope messages. For the first manipulation check, respondents (n = 13) watched a series of four public service announcements with the message of H1N1 flu virus prevention. The videos were gathered from YouTube and sponsored by a variety of organizations, and a pretest questionnaire was designed to determine the degree of fear and hope in the messages. A final manipulation check was then employed in the questionnaire with questions pertaining to the respondents' feelings of fear and hope after exposure to the message. The one-item measures for fear were not significant, so correlational analyses were then employed.

Instrumentation

The questionnaire contained items testing engagement, behavioral intent, knowledge of the H1N1 pandemic and attitudes toward vaccination against the disease.

Risk Behavior Diagnosis Scale

The Risk Behavior Diagnosis Scale (RBD) is a 12-item, 7-point Likert-type scale, ranging from 1 (*strongly disagree*) to 7 (*strongly agree*) (Witte et al., 1996). It includes three questions each about perceived attitudes toward susceptibility, severity, self-efficacy, and response efficacy toward a certain behavior, topic or message, and allows researchers to identify whether respondents are in either fear control or danger control processes (Witte et al., 1996).

Severity. Respondents rated the severity of the messages on a 5-point Likert scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*):

How much do you agree or disagree that the current H1N1 situation is urgent?

Respondents also indicated their level of agreement with the following three statements on a 5-point Likert scale, ranging from 1 (*not at all*) to 5 (*very much so*):

I believe that swine flu is severe.

I believe that swine flu has negative consequences.

I believe that swine flu is extremely harmful. (Cronbach's a = .8)

Susceptibility. Respondents rated the following item on a 5-point Likert scale ranging from 1 (*very easy*) to 5 (*not easy at all*):

When you think of swine flu, how EASY do you think it is for people to get the virus?

Respondents also indicated their level of agreement with the following statement on a 5-point Likert scale ranging from 1 (*not at all*) to 5 (*very much so*):

I am at risk for getting swine flu.

Next, respondents answered the question on a 5-point Likert scale ranging from 1 (*very likely*) to 5 *(not at all likely*):

How likely do you think it is that you will get sick from swine flu?

Finally, on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*), respondents answered the following questions:

How much do you agree or disagree that you can increase your risk of getting swine flu frombeing in close contact (within 6 feet away) of someone who has the virus?

How much do you agree or disagree that you can increase your risk of getting swine flu frombeing 20 feet away from someone who has the virus? (Cronbach's a = .6).

Response Efficacy. Respondents rated the following items on a 7-point Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*):

Getting the vaccine is effective in preventing swine flu

If I get the vaccine, I am less likely to get swine flu.

Respondents also rated the following questions on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*):

How much do you agree or disagree that there is an effective vaccine to help protect against swine flu? (Cronbach's a = .7)

Self-Efficacy. Respondents rated the following items on a 5-point Likert scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*):

I am able to get the vaccine to prevent getting swine flu

I can easily get the vaccine to prevent getting swine flu (Cronbach's a = .8)

The measures of *severity* and *susceptibility* were then indexed to create a measure called *perceived threat* (Cronbach's a = .5), and *response efficacy* and *self-efficacy* were indexed to create a measure called *perceived efficacy* (Cronbach's a = .6).

Dependent Variables

Engagement Scales. Engagement was measured with fifteen questions about how much the respondent concentrated on and exerted mental effort while exposed to the message, as well as the evaluation of the credibility, effectiveness, and persuasiveness of the public service announcement.

Respondents indicated their level of agreement with the following statements on a 7-point Likert scale, ranging from 1 (*strongly disagree*) to 7 (*strongly agree*):

When I watched the video, I concentrated on its message about the H1N1 virus.
It took some mental effort to watch the PSA.
I paid attention to the content of the PSA.
The swine flu PSA made me curious to learn more about H1N1.
The swine flu PSA held my attention.
The swine flu PSA was intrinsically interesting.
The swine flu PSA encouraged me to think about consequences.
The swine flu PSA kept me absorbed in the message.
Overall, the swine flu PSA I just watched was convincing.
Overall, the swine flu PSA I just watched was effective.
Overall, the swine flu PSA I just watched was credible.
Overall, the swine flu PSA I just watched was persuasive.
While watching the PSA, I imagined the events taking place.
While watching the PSA, I blocked out most other distractions.
After watching the PSA, I found it easy to put it out of my mind.

The questions were then compiled into two indexes: cognitive engagement, consisting of two measures, and emotional engagement, consisting of nine measures (Cronbach's a = .9).

Behavioral Intention Scales. Behavioral outcomes were measured with questions pertaining to self-protective behaviors, taking precautions, talking to others, and likelihood of vaccination. Self-protective behaviors were measured on a 5-point Likert scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*):

How much do you agree that you can help protect yourself from getting swine flu by covering your mouth when you cough?

How much do you agree that you can help protect yourself from getting swine flu by Washing your hands with soap and water?

How much do you agree that you can help protect yourself from getting swine flu by using hand sanitizer?

Taking precautions was measure with the following question,

How likely are you to take precautions against swine flu?

These measures were then indexed to create a measure called *protection motivation*.

Talking to others about H1N1, or defensive motivation, was measured with the following question,

I plan to talk to others about swine flu.

Finally, vaccination likelihood was measured on a 5-point Likert scale with the question,

How likely are you to get vaccinated for the swine flu virus in the next three months?

RESULTS

Correlation analysis was conducted to determine significant correlations of the components of EPPM while also testing the concept of engagement as a possible mediator in the relationships among threat, efficacy, severity, susceptibility, response efficacy, self-efficacy and behavioral outcomes.

The correlations for the variables of severity, susceptibility, self-efficacy, response efficacy, cognitive engagement and emotional engagement in relation to each research question are presented in Tables 1, 2 and 3. Because no hypotheses were proposed regarding demographic information and no significant correlations were found from the variables of perceived knowledge and Internet use, these correlations are not discussed here.

First, as can be seen in the significant correlations between the factors of EPPM, engagement, and behavioral outcomes, perceived threat is statistically significant in predicting protection motivation, according to Table 1, with the severity of the H1N1 pandemic accounting for the majority of this relationship. ($p < .05$). The relationship between perceived efficacy and protection motivation did not yield significant correlations.

With the addition of engagement into the model, the relationship between severity and protection motivation becomes insignificant ($p > .10$) according to Table 2. The emotional engagement the respondent felt as a result of exposure to the health message becomes the only statistically significant coefficient ($p < .01$). Thus, the direct relationship between perceived severity and protection motivation indicates the mediation of engagement. This mediation is accounted for primarily by emotional engagement as cognitive engagement was also non-significant.

Second, perceived threat is statistically significant ($p < .01$) while perceived efficacy is only marginally significant ($p < .10$) in predicting defensive motivation according to Table 1.

Severity, susceptibility, and self-efficacy regarding the H1N1 pandemic are significant predictors ($p <.01$) while response efficacy is non-significant.

With the addition of engagement into the model, the direct relationships between severity, susceptibility, and self-efficacy and defensive motivation do not diminish entirely according to Table 2. Only the significance of severity decreases somewhat to the level of marginal significance ($p < .10$), but the two other EPPM components remain highly correlated ($p < .01$). Emotional engagement is only marginally significant in predicting defensive motivation ($p < .10$) while cognitive engagement is non-significant. Engagement is thus a co-predictor in the model, accounting for approximately 9% of the variance in defensive motivation.

TABLE 2
CORRELATIONS BETWEEN SEVERITY, SUSCEPTIBILITY, RESPONSE EFFICACY, SELF EFFICACY, COGNITIVE ENGAGEMENT, EMOTIONAL ENGAGEMENT AND BEHAVIORAL OUTCOMES

	Self-Protective Behaviors	Likelihood of Vaccination	Taking Precautions	Talking to others about H1N1
Severity	.05	.33	.14	.26
Susceptibility	.12	-.05	.16	.38**
Response Efficacy	-.09	.76***	.13	-.06
Self-Efficacy	.04	.05	.03	.24**
Cognitive Engagement	.08	-.41***	-.02	.06
Emotional Engagement	.25***	.15	.02	.14

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

Lastly, perceived threat is marginally significant ($p < .10$) while perceived efficacy is highly statistically significant ($p < .01$) in predicting vaccination likelihood according to Table 1. Severity and response efficacy accounted for the majority of the relationship between perceived threat and efficacy and vaccination likelihood as they are highly correlated with the particular behavioral outcome ($p < .01$).

With the addition of engagement into the model, severity and response efficacy maintain significance ($p < .05$) according to Table 2, while engagement also becomes a co-predictor, as cognitive and emotional engagement are both significant as well. Cognitive engagement accounts for higher covariance with vaccination likelihood ($p < .01$) as emotional engagement is only marginally significant (p=.07). Cognitive engagement explains about 4% of the variance in vaccination likelihood while emotional engagement is responsible for 3% of the variance.

The results of these analyses indicate variability within the correlations that have illustrated protection motivation, defensive motivation, and likelihood of vaccination in the Extended Parallel Process Model. Respondent perception of H1N1 as a threat is highly correlated with protection motivation, which includes self-protective behaviors and taking precautions against the H1N1 virus. The perceived severity of H1N1, as opposed to one's feeling of susceptibility, is highly related to the outcome of protection from the threat. However, this relationship can be mediated by evoking a media message that is emotionally engaging. Respondent perception of severity, susceptibility, and feelings of ease about getting a vaccine are highly correlated with defensive motivation, which includes talking to others about the H1N1 pandemic. Respondent feelings of high emotional engagement after viewing a health message are also highly correlated with defensive motivation. Finally, respondent perceptions of the severity of the H1N1 pandemic, the existence and

TABLE 3
CORRELATIONS BETWEEN PERCEIVED THREAT, PERCEIVED EFFICACY, COGNITIVE ENGAGEMENT, EMOTIONAL ENGAGEMENT AND BEHAVIORAL OUTCOMES

	Self-Protective Behaviors	Likelihood of Vaccination	Taking Precautions	Talking to others about H1N1
Perceived Threat	.28	.24*	.29	.66***
Perceived Efficacy	-.04*	.75***	.14	.21*
Cognitive Engagement	-.04	-.45***	-.03	.08
Emotional Engagement	.24***	.20	.02	.13

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

effectiveness of a vaccine to combat it, and the engagement of the message are related to vaccination likelihood.

DISCUSSION

Overall, the results show that, with regard to the H1N1 virus threat, when individuals consider a threat severe, they are more likely rely on cognitive evaluations of the health message and act in a self-protective manner. As described, according to the EPPM, fear control processes begin to overtake danger control processes at the critical point when perceptions of efficacy do not measure up to perceptions of the threat, and a message is effective when individuals respond to it through danger control processes (Witte, 1992).

The results suggest that when engagement is added to the EPPM framework, it becomes a mediator or predictor of certain behavioral outcomes, potentially stretching the critical point at which a message is considered effective, but only according to the level of engagement.

Research Question 1 asked about the relationship between fear appeals and engagement, and Hypothesis 1 predicted that a fearful and hopeful message would elicit higher engagement than a fear only message. Because the manipulation checks did not render any statistically significant differences between fear and hope, Hypothesis 1 cannot be supported.

The remaining research questions asked about the relationships among emotional engagement, cognitive engagement, perceived threat, perceived efficacy, severity, susceptibility, self-efficacy, and response efficacy and behavioral outcomes. The results from the correlational analyses suggest that a message emphasizing the severity of a threat is more likely to be emotionally engaging than cognitively engaging, and emotional engagement is correlated with self-protective behaviors regardless of the level of severity. Danger control processes are primarily cognitive, and Witte (1994) concluded that a fear

appeal's message will be accepted, and danger control processes initiated, only if the efficacy of the recommended response outweighs the threat. However, the results of this study indicate that if a message is emotionally engaging, the severity of the threat becomes irrelevant. Assuming an emotionally engaging message produces an overestimation of the severity of a threat in a fear appeal, which is seen as a prerequisite to message rejection in EPPM and fear appeals research, the point at which a message is deemed too fearful can actually be stretched and result in a danger control response as well as message acceptance.

Additionally, the results suggest that in inducing vaccination intentions, the perceived efficacy of the recommended response is predictably more effective than perception of the threat, although both are statistically significant. Response efficacy and severity make up most of the significance, meaning that, if after watching an H1N1 fear appeal an individual perceives the virus as severe but also believes the recommended response will be effective in combating the threat, he or she will likely get the vaccine. This is consistent with prior EPPM research which asserts that while the severity of a threat impacts the potency of the response to the appeal, it is the efficacy of the response that leads to behavioral change (Gore & Bracken, 2005).

When engagement was added to the existing EPPM model, specifically to the danger control response, cognitive engagement was strongly correlated with vaccination likelihood. This is also consistent with prior research which suggests that cognitive, rational judgments are more effective at inducing danger control responses than fear control responses, which often result in an overreliance on emotion (Gore & Bracken, 2005).

This study found that although both perceived threat and perceived efficacy must be present in a fear appeal that urges people to talk about the consequences of H1N1, perceived threat is more effective. Viewers must feel that the threat is serious and personally relevant, but in order to talk to others about H1N1, they must also believe they are able to perform the recommended response. Response efficacy was not found to be statistically correlated with talking about H1N1. Essentially, the efficacy of the recommend response may then be a product, not of the fear appeal itself, but of conversation and discussion with others.

Moreover, this study's findings suggest that emotional engagement is more effective in bringing about discussion about H1N1. This may be because individuals must critically examine the credibility of the message before talking to others about it.

Practical Implications

Strategies to prevent the spread of pandemics such as H1N1 are certainly pervasive, but not always persuasive. Most people are aware of basic preventative steps, but either cannot or choose not to take them. Because they motivate behavioral outcomes, knowing how to strategically and effectively formulate fear appeals can be a critical skill in preventing future outbreaks. Therefore, creators of health PSAs who want people to perform

self-protective behaviors will most likely achieve results with an emotionally engaging message that emphasizes the severity of the threat rather than the individual's susceptibility to it. Furthermore, in order to inspire passionate debate and discussion about a particular health threat, creators of fear appeal messages must not only emphasize severity, susceptibility and self-efficacy, but the message must also be credible, persuasive and emotionally engaging. Before using a PSA in a public health campaign, the message should be tested not only for the level of fear it induces, but also for its ability to engage an audience. The EPPM posits that fear plays a central role in a fear appeal's effectiveness, but too much fear will result in maladaptive responses (Witte, 1992). These results suggest that gruesome and shocking images may still work in a video PSA even if the efficacy of the recommended response does not measure up to the threat, but only if the message itself is engaging. For instance, a PSA similar to those used in this research, which compares the number of casualties of the influenza virus with that of World War I with bold text and images of rotting carcasses, would most likely pass the critical point and induce fear control processes. But, if the message is perceived as engaging, the high fear appeal would be more likely to result in adaptive behavior change than an unengaging, low to moderate fear appeal. Ultimately, creators of fear appeals should try to balance threat and efficacy only after considering the engagement of the message, a factor which could affect the success of a public health campaign and prevent the spread of potentially disastrous disease.

Limitations and Suggestions for Future Research

The most impactful limitations of this study are threats to internal validity. Because the manipulation check did not result in statistically significant differences between the two experimental conditions in the first part of this study, causal relationships could not be inferred – only correlational. Since causality could not be determined, it is impossible to tell which condition was responsible for the significant correlations found in the correlational analyses. In order to study the impact of fear and hope on engagement and behavioral outcomes, future research should incorporate stronger stimuli with clearer distinctions between the two emotions.

Also, because the message attempted to generate fear by comparing the number of deaths from H1N1 with the number of deaths from World War I and the War on Terror, the resulting fear could be due to perceptions of fear of war or terrorism, not H1N1. Additionally, the conditions under which respondents watched the fear appeals were not monitored, so the size of the screen on which the fear appeal was watched, the number of people it was watched with and distractions like other open internet browsers could have affected the resulting levels of fear. Future research could, at the expense of ecological validity, standardize the viewing environment for all subjects to address these issues and determine if, as the size of the viewing group increases, heightened perceptions of susceptibility are outweighed by social desirability.

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SEXUAL HEALTH CONTENT OF MASS MEDIA IN NIGERIA: AN EXPLORATORY STUDY

ONIPEDE WUSU

The sexual health content of the Nigerian media has been largely obscured. The main objective of this study was to examine the frequency of occurrence of scientifically classified sexual health content of mass media in the country. Data were gathered from stratified sample of the media in the country. Two print media, two radio and two Tv stations were selected. Analysis employed a modified content analysis strategy. Analysis indicates that sex education content occurred 10 times in print A, twice in print B, and contraception was nil in the two while sex provoking contents (sexual relationships and nudity) occurred 23 and 16 times in print A and print B respectively. Radio A & B recorded sex education content 19 times; contraceptive use occurred twice and sex provoking, 10 times. TVs A & B recorded sex education 16 times, contraceptive use 13 times while sex provoking content occurred 22 times within the study period. Sex provoking content is more predominant in the selected media. Information on contraception which is critical to the health of sexually active individuals is poorly represented in the media. These findings demand deliberate efforts by appropriate agencies to monitor and adopt methods of promoting positive sexual health messages as a channel to reduce the burden of sexual health problems, especially among young people, on the fragile democratisation process in the country.

Keywords: sexual, health, content, mass, media, Nigeria, exploratory

The role of the mass media in the rapid spread of information about almost every aspect of human life all over the world cannot be over-emphasized. In the words of Wijesundara (2011: 21), the term mass media can be described as "means of communication that operate on a large scale, reaching and involving virtually everyone in a society to a greater or lesser

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degree. It includes newspaper, magazine, film, radio, television, recorded music and phonograph." There is a growing evidence that people spend a high proportion of their time consuming various contents of the media daily, young persons are notorious in this regard (Engle, Brown and Kenneary, 2006). Jan (2005) quoting Davies (1993: S-28) emphasized that "by age 18 a young person will have seen 350, 000 commercials and spent more time being entertained by the media than any other activity except sleep." This degree of exposure is certainly capable of exerting enormous influence on the general attitude and behaviour of young people, especially risk taking behaviour including risky sexual practices (Strasburger & Donnerstein, 1999; Lo & Wei, 2005; Somers & Tynan, 2006; Ward & Friedman, 2006; Tahlil & Young, 2009; Zhang, Miller & Harrison, 2008; Wusu, 2009). However, little scientific information about the sexual health content of the mass media in Nigeria exists. It is against this background that the present study seeks to examine the pattern of the sexual health content of the Nigerian media. Sexual health content in the context of this study is defined as the message in the media on sexually related attitude and practice that is capable of promoting either risky sexual behaviour or healthy sexual life among their audience (especially among young people).

Previous studies have shown that the main aim of the media is to motivate and titillate in order to attract the ever ready audience and information covered up with sexual related imageries is seen as the most common means to achieve this (Brown & Keller, 2000; Utomo & McDonald, 2006). There is a consensus in the literature that the media have always had a lot of sexual related contents (Pardun, L'Engle & Brown, 2005, Ashby, Arcari & Edmonson, 2006; Eyal et al., 2007). The picture painted by Hitchens (2002:9) as quoted in Buckingham and Bragg (2004:2) is an epitome of the characteristics of media content in a typical western country: "it is very hard to be innocent in modern Britain. Advertising on television, on posters and on the radio, is drenched in sexual innuendo. Television programmes rely almost entirely on sex and violence to raise their drooping audience figures. The playgrounds of primary schools echo with sexual taunts and jibes. Rock music, which is now almost compulsory in the lives of even the youngest, is full of sexual expression and desire." Thus sexual referencing has become a very common practice in almost all media in more developed countries. Is the situation in less developed countries such as Nigeria different?

The challenging aspect of the sexual content of the media is that the media portrays mainly the positive angle of human sexuality ignoring the devastating negative consequences attached to sexual risks or responsibilities and completely overlook the necessity of protection against STIs and unwanted pregnancies (Brown, 2002; Werner-Wilson, Fitzharris & Morrissey, 2004; Jan, 2005; Pardun, L'Engle & Brown, 2005; Brown, Halpern & L'Engle, 2005; Jan, 2005; Eyal et al., 2007). For instance, L'Engle, Brown & Kenneavy (2006: 191) argue that "the majority of sexual content in the media depicts risk-free, recreational sexual behaviour between non-married people". They argue that "media

programming seldom portrays the negative consequences from sexual behaviour, and depictions of condom and contraceptive use generally are extremely rare." In a similar vein, Strasburger & Donnerstein (1999) observe that nearly 15,000 sexual references are made each year and less than 170 deal with abstinence, birth control, sexual transmitted infections and pregnancy.

The analysis of the content of the media with respect to sexuality is very important because of the growing evidence on the influence of the media on young people in particular. Young people's perception and attitude to sexuality are shaped mainly by the media through the formal and informal messages portrayed about it and greater exposure to the sexual content of mass media is highly correlated to increased sexual activities(Jan, 2005; Rich, 2005; Tahlil & Young, 2009; Brown et al., 2006; Zhang, Miller & Harrison, 2008). It has also been argued that young people see the media as the most convenient and secure source of sexual information (Brown et al., 2006). However, some studies have reported that the media provide information that are capable of improving the reproductive health of young people through the provision of information on contraceptives and increasing STIs awareness (Oladele & Asekun-Olarinmoye, 2009; Osakue et al., 2009).

The question that has not been adequately addressed is what proportion of the Nigerian media concentrates on these positive sexual and reproductive health messages, or how frequent do such messages appear in various media in the country? A related question we should ponder over is if the media landscape of the country is x-rayed, what is the pattern of space distribution between messages that promote sexual and reproductive health and those that encourage risky sexual behaviour in the population? More importantly, there have been upsurge in sexual health problems afflicting adolescents in developing countries, particularly in Nigeria (Hindin & Fatusi, 2009; Bankole & Malarcher, 2010) with attendant pressure on the health facilities. Can the mass media be accused of aggravating the problem or can it be utilised to execute war against this problem? There is no gain saying that providing answers to these questions are germane to the on-going democratisation process in the country. Because improved health stands as one of the key benefits of democracy the Nigerian people would love to enjoy. Therefore, the importance of a scientific analysis of the sexual health content of the mass media in the country as an attempt to provide answers to the questions raised above cannot be over-emphasized. This study adopts a modified content analysis approach of randomly selected mass media in addressing these questions.

METHODS

The study population includes three popular media in Nigeria: newspapers, radio and television stations. A stratified random sample of print and electronic media was drawn to elicit data. The media was stratified into print, radio and Television (electronic media). A

Table 1: Total number of sampling units for print and electronic media

S/N	Media	Sampling Units	Total Number of Pages/Programmes
1	Print Media	Pages	5724
2	Radio Media	Programmes	211
3	Television Media	Programmes	352

list of print and electronic mass media with national coverage was prepared and two each of print media, radio and television stations were selected for the purpose of the study. A simple random process was employed to select the Print A and Print B in print media category, Radio A (privately owned) and Radio B (publicly owned) as well as TV A (privately owned) and TV B (publicly owned) for electronic media. The media selected for the study constitute over 5 percent of each sub-population.

Data on print media on the nature and frequency of sexual and reproductive health content were generated from one year archive of two selected newspapers between December 2008 and November 2009. As shown in table 1, a total of 5724 pages of two national daily newspapers were combed searching for appearance of the four sexual health contents of the media that were theoretically classified (see table 2). Details of the classifications that are shown in table 2 include sex education, contraceptive use, sex partnership and nudity.

On the other hand, the selected four electronic media stations were listened to (radio) and observed (Tv) for eight days and for eight hours daily (9am – 12 noon and 4 pm - 9 pm) simultaneously with the assistance of three field assistants between February 2 and 9 2010 without the knowledge of the operators. Two hundred and eleven (211) radio programmes as well as 352 TV programmes were also listened to and watched respectively noting the occurrence of the classified sexual health contents.

A modified content analysis strategy was adopted in the analysis of the sexual health content of selected print and electronic media. A similar approach was used in a similar study in the United States where sexual socialisation messages on TV were examined (Eyal, et al., 2007). This approach was considered appropriate because it enables capturing the pattern of the relative frequency of the occurrence of messages on sexual health in the media. In this approach, the frequencies of the occurrence of the theoretically classified sexual health contents in the last one year were prepared for print A and B media and for eight days for the radio A and B as well as TV A and B. This analytical strategy was adopted to highlight the relative frequency of occurrence of various aspects of sexual health contents of the media in the country.

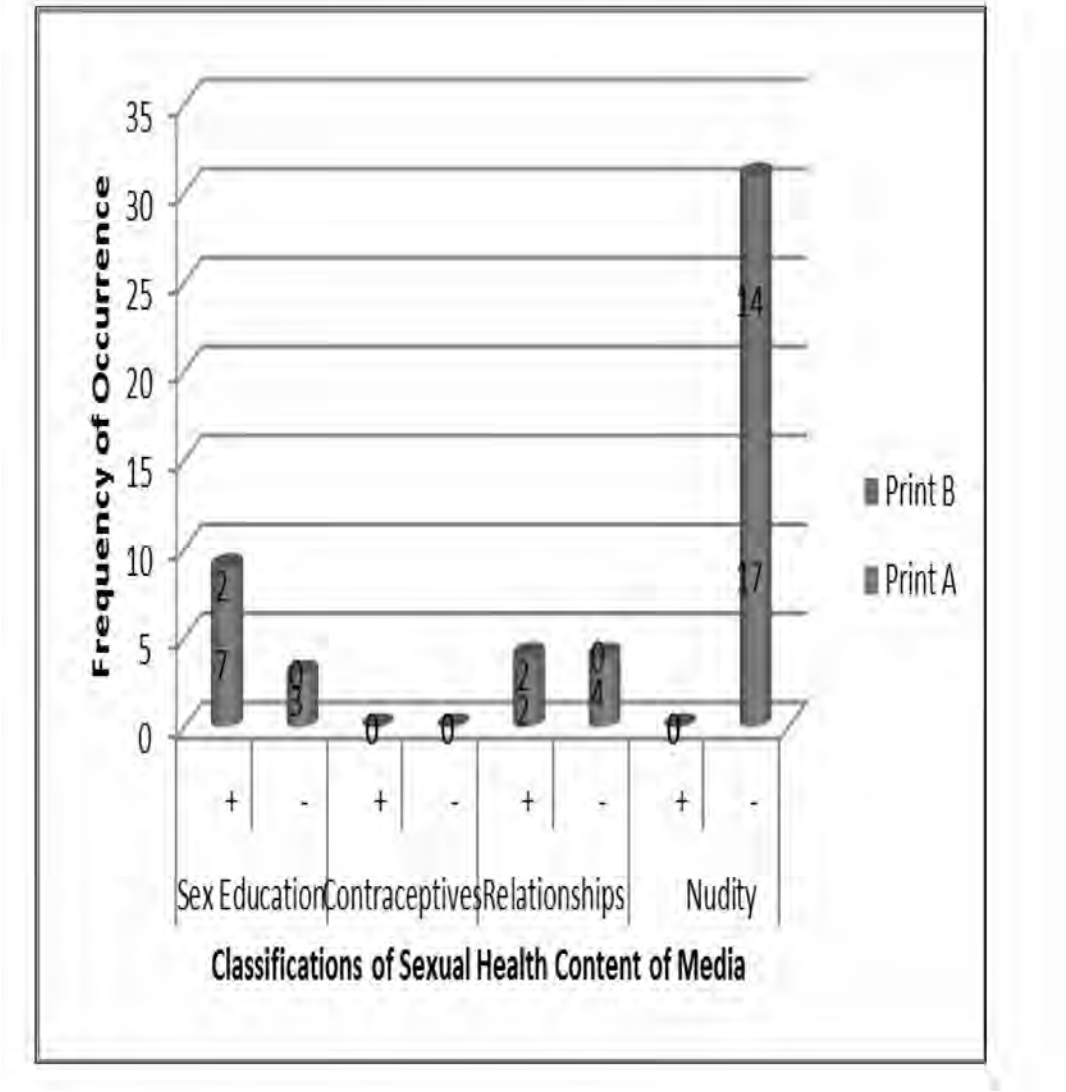
Table 2: Details of classifications of sexual health content of media

Classifications of Sexual Health Content	Positive +	Negative -
Sex Education	Publications or programmes providing information on how to ensure healthy sexual life.	Publications or programmes providing information capable of provoking unhealthy sexual practices.
Contraceptive Use	Publications or programmes encouraging use of contraceptives to prevent unwanted pregnancy and STIs among couples.	Publications or programmes encouraging use of contraceptives among singles without emphasizing the unacceptability of premarital sex.
Sexual Partnerships	Publications or programmes on ethics of a happy marriage life.	Publications and programmes discussing sourcing of boy/girl friends and sexual pleasure aspect of such relationships.
Nudity	Publications or programmes discouraging nude dressing.	Publications or programmes with all forms of nude human pictures.

FINDINGS

Figure 1 shows the observed occurrence of the four classifications of sexual health content of the two national Newspapers studied. In Print A and B, occurrence of positive sex education related publication that is capable of promoting responsible sexual behaviour among young people recorded the highest frequency compared to publications on sex education capable of having negative influence on sexual health behaviour of readers. Within the period of study there was no mention of contraceptives in both print media. In Print A, negative publications on sexual relationship capable of aggravating risky sexual

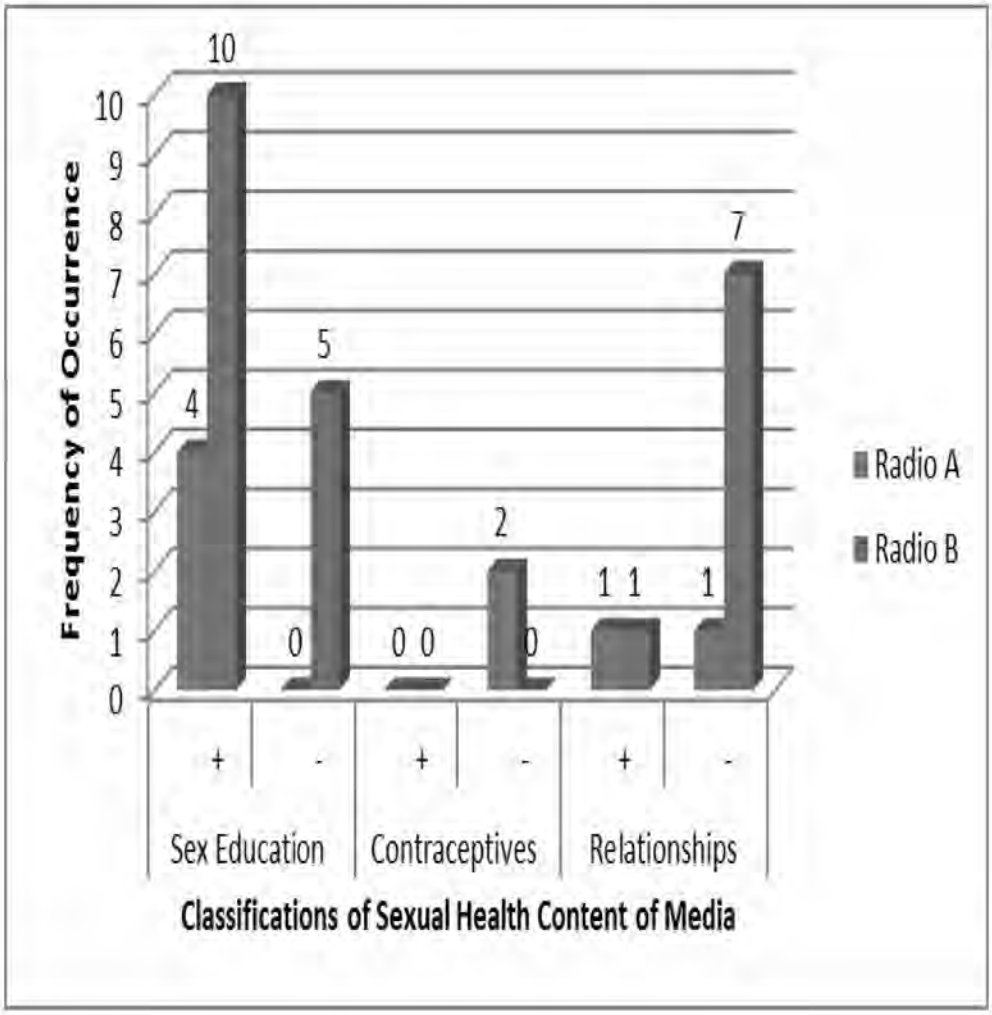
Figure 1: Pattern of sexual health content in two national print media (between Decembers 2008 and November 2009).



activities had higher occurrence than positive publications. The reverse was the case in Print B. It is striking to note that in both Print A and B, publications with adverts having nude human pictures (pornography) that can arouse sexual feelings among readers recorded highest occurrence relative to positive or adverts with modest human pictures portraying the intention that nudity is socially unacceptable.

Figure 2 shows the pattern of the occurrence of three of the classifications of sexual health contents of the two radio stations is shown (nudity is excluded because it is not

Figure 2: Pattern of sexual health content in two radio stations between 2nd and 9th February, 2010.



applicable). To start with, in the two radio stations sex education messages capable of promoting positive sexual behaviour in the population scored the highest frequency of occurrence. Radio B recorded a relatively high occurrence of programmes that are likely to motivate risky sexual behaviour in the population compared to radio A where such programmes were not aired at all within the period of study. Occurrence of issues related to contraceptives was low in both radio stations but programmes on contraceptives that can promote risky sexual behaviour, especially among young people was relatively high in radio B. It is apparent in the figure that programmes on relations capable of engendering risky

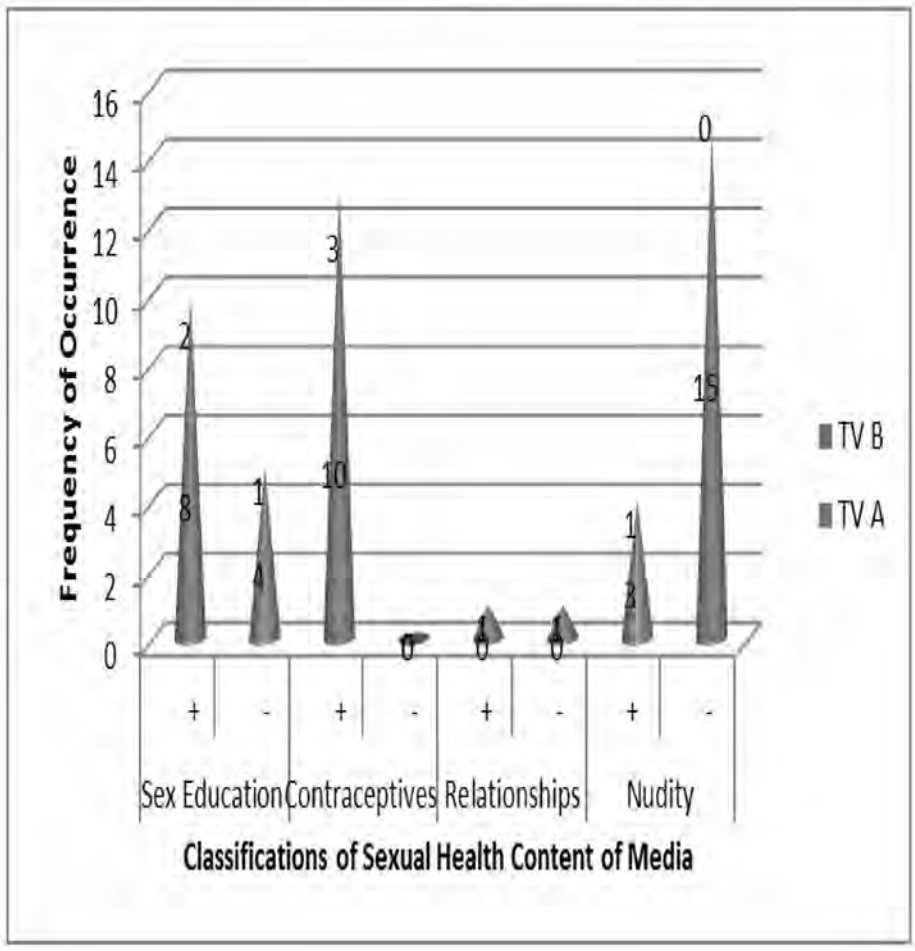
sexual behaviour in the society were more prevalent than those that can have positive influence on sexual health. Radio B exhibited the highest frequency of occurrence of such programmes.

The frequencies of occurrence of the four classifications of sexual health content in the two TV stations selected for this study are shown in figure 3. The figure shows that TV A aired sex education programmes with both positive and negative implications for sexual behaviour more than TV B. This notwithstanding, TV A aired programmes that can exert positive influence on sexual health in the population that were double the size of those that can make negative impact. With respect to programmes on contraceptives or family planning, TV A recorded high frequency of occurrence of programmes that can spread positive use of contraceptives in the population and nil for contrary programmes. Similarly, TV B exhibited relatively few programmes on contraceptives that are capable of improving sexual health but none of those that can engender negative sexual health. Messages on sexual relationships that have both positive and negative implications for sexual health scored nil frequency of occurrence on both TV A and B. Programmes with nude content that are capable of promoting risky sexual behaviour among viewers recorded strikingly high frequency of occurrence on TV A and a very low occurrence of programmes with nude content but with positive implications for sexual health. In this case, TV B was almost nil on both sides.

Concluding Remarks

This study has examined the pattern of sexual health contents of a sample of the Nigerian mass media. The main question the study sought to answer was what is the pattern of space distribution in the media between messages that promote sexual and reproductive health and those that encourage risky sexual behaviour in the population? The review of the literature aided the classification of the sexual health content into four and the whole of the study concentrated on the frequency of the occurrence of these contents. First, sex education was implicitly categorised into two namely positive and negative. In the two print media studied, publications on positive sex education that is capable of promoting healthy sexuality was more frequent than negative ones. This implies that the national newspapers in the country are more likely to publish pages on sex education with the purpose of promoting sexual health in the society than the negative ones that can increase risky sexual behaviour, through their influence on their readers. Radio and TV media on sex education exhibited similar pattern. More of programmes on sex education capable of promoting healthy sexuality were aired by both electronic media than those with negative implications for sexual health. This finding confirms the claim of a section of previous studies which concluded that the media are crucial sex educators today and will remain critical providers

Figure 3: Pattern of sexual health content in two TV stations between 2nd and 9th February, 2010.



of sex education and other sexual health related information in the future (Brown & Keller, 2000; Oladele & Asekun-Olarinmoye, 2009; Osakue et al., 2009). However, it is important to note that limited space is given to such publications or programmes. Sex education related publications occurred only 10 times out of 5724 pages of the print media reviewed, 15 times each out of 211 radio programmes listened to and 352 TV programmes observed during the respective study periods. This observation is consistent with findings of previous studies indicating that positive sexual health content is generally rare in the media (L'Engle, Brown & Kenneavy, 2006)

Occurrence of publications on contraceptives was surprisingly nil in the two print media studied. It was also very poor in the radio programmes listened to during the period, the few ones that were aired implied negative influence capable of promoting poor sexual

health in the society. The picture painted here is a reflection of the fact that the media generally do not give attention to publications or programmes highlighting the risk involved in unprotected sexual behaviour but rather they prefer to portray sexual activities as risk free, so there is no need of talking about contraceptives (Jan, 2005; L'Engle, Brown & Kenneavy, 2006). On the other hand, the TV stations observed deviated a little from this pattern. Messages on contraceptives occurred 13 times out of the 352 programmes observed and it concentrated mainly on the positive angle that can promote sexual health.

Representations on whether formal sexual relationships (in marriage) or informal (outside marriage) publications and programmes were generally poor with the exception of radio media. Radio media recorded a relatively high frequency of occurrence of programmes on sexual relationship capable of promoting unhealthy sexual activities in the society. The publicly owned radio station was notorious in this. Sex provoking nude human pictures (usually females) recorded very high frequency of occurrence in both print and TV media studied. The occurrence of sex provoking nude human pictures in the two print media was very high, it occurred 31 times. This was the highest of all the frequencies across the four sexual health contents. Similarly, occurrence of sex provoking nude pictures was particularly high in the privately owned TV station observed and this was also the highest frequency across the four sexual health contents. This pattern of the occurrence of nudity expressly supports the findings of earlier studies that sex provoking images are generally used in the media to attract their audience without consideration for the devastating effects on their sexual behaviour (Brown and Keller, 2000; Utomo and McDonald, 2006).

In conclusion, the three categories of mass media studied published and aired programmes relatively more on sex education capable of promoting improved sexual health than the ones that are likely to increase sexual health problems in the country. However, it was the negative part of all other sexual health contents (contraceptives, sexual relationships and nudity) that enjoyed the patronage of all the three categories of mass media studied. Negative in the sense that the publications or programmes on these contents reviewed, listened to, or observed were more likely to aggravate sexual health problems among their audience and so create more health challenges in the country. Therefore, in order to reduce sexual health problems in the country, and consequently shrink the burdens on the health sector in our democratization process, it is imperative to develop a policy that will promote the provision of positive sex education in the mass media in the country. This may include a framework stipulating that the media should make provision for a minimum of two or three occurrences of positive sex education in their publications or programmes a week. There is also the need to establish a unit in the regulatory body overseeing the media, and charge it with the responsibility to monitor the media towards ensuring less of sex provoking content in their publications or programmes.

Finally, this study has focused on the media accessible to the general populace. However, young people constitute a significant vulnerable population as far as sexual health

challenges and media consumption are concerned. Therefore, there may be more insight on the sexual health content of the media they consume if further studies focus more specifically on the media that are popular among young people. This would provide scientific information on such media and could inform drawing up policy specifying guidelines on the sexual health contents. It is very likely that such guidelines would reduce the risk of young people getting contaminated through the consumption of such media.

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EXPLORING ATTRIBUTIONS AND EMOTIONAL REACTIONS IN PROCESSING NARRATIVES ABOUT OBESITY

HYE KYUNG KIM, DANIELLE BARTOLO AND JEFF NIEDERDEPPE

Guided by the Attribution-Emotion Model of Stigmatization (Weiner, 1996), this study examined how narratives addressing individual and societal causes of obesity were processed by readers. Specifically, we examined whether those narratives have the potential to improve public support for societal-level solutions (policy changes) for obesity. We conducted a between-subject experiment in which participants (n = 113) were randomly assigned to one of three narrative conditions. In each of the narratives, societal responsibility was kept constantly high, while the protagonist demonstrated varying levels of personal responsibility for her weight control (i.e., high, medium, and low). Results suggest strong, explicit acknowledgment of personal responsibility in narratives may invite readers to perceive greater individual controllability for obesity and, as a result, increase blame toward a character for her inability to control her weight. These unintended effects in turn, may minimize support for collective interventions to address the obesity epidemic. We conclude with a discussion of theoretical and practical implications of these findings.

Keywords: attribution of responsibility; anger; sympathy; obesity; narrative

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Given obesity's status as the second leading cause of preventable death in the United States, increasing rates of obesity are a major public health concern (Mokdad, Marks, Stroup, & Gerberding, 2004). In designing messages to reduce population health consequences of high obesity rates, scholars have emphasized the need for addressing personal factors (e.g., decisions to diet and exercise) as well as societal factors (e.g., neighborhood conditions and socioeconomic context) that lead to obesity (Niederdeppe, Bu, Borah, Kindig, & Robert, 2008). Since people tend to over-emphasize personal factors and under-emphasize contextual factors when making causal attributes for others' negative life experiences (Gilbert & Malone, 1995), it is likely that many people will blame an individual's shortcomings (e.g., lack of motivation) rather than structural or environmental factors, for high rates of obesity (Oliver & Lee, 2005). A lack of public awareness of the societal factors that contribute to obesity presents challenges for efforts to increase support for environmental policy change intending to reduce rates of obesity in the U.S. and elsewhere (Niederdeppe et al., 2008). Scholars have argued for the importance of addressing personal and societal responsibilities in complementary ways to endorse collective actions that support responsible health decisions through policy and environmental change (e.g., Brownell et al., 2010). To date, however, little is known about how best to combine these two approaches in ways that promote public support for societal-level interventions to reduce rates of obesity.

Narrative messages have been proposed as a promising strategy for changing public perceptions on the causes of and the solutions for social issues, in light of their ability to model behavior and overcome reactance to persuasive advocacy (Strange, 2002; Strange & Leung, 1999). This study examined the use of narrative as a public campaign strategy to increase societal attributions for causing and addressing obesity because personal stories hold strong potential to convey information about both personal and societal responsibility for obesity (Niederdeppe, Shapiro, & Porticella, 2011; Hoeken & Hustinx, 2007; Tsoukas & Hatch, 2001). Based on the Attribution-Emotion Model of Stigmatization (Weiner, 1996), this study focuses on elements of viewer's causal attributions (both personal and societal causes of obesity), perceived controllability of the obesity issue, blame toward a narrative character, and emotional responses to that character (i.e., sympathy and anger), which are proposed as predictors of support for societal solutions to obesity. Thus, the aims of this study are two-fold: (1) to examine how personal responsibility attributed to a narrative's protagonist influences viewers' causal attributions of obesity when the message is designed to improve public support for societal-level solutions for obesity (i.e., levels of societal responsibility are kept constantly high), and (2) to provide a better understanding of how narratives about obesity are processed.

LITERATURE REVIEW

Obesity is caused by complex interactions between genetic and biological predispositions, personal decisions about diet and exercise, and societal factors such as the marketing of low-cost unhealthy food, relative unavailability of fresh and healthy food and substantial environmental barriers to exercise (Bodor et al., 2008; Sallis et al., 2006). While individuals have some control over their decisions about diet and exercise, many societal factors (and some decisions) are beyond individual control because environmental constraints restrict choice and opportunities for healthy choices (Niederdeppe et al., 2008). This underscores the need for interventions that incorporate both personal and societal approaches to reduce obesity (Brownell et al., 2010).

Causal Attributions for Obesity and Message Framing

Attributions are "perceptions of the causality or the perceived reasons for a particular event's occurrence" (Weiner, 1985, p.280). People make sense of the world by attributing the causes of events or other people's dispositions based on two dimensions: (a) the locus of control (i.e., the degree to which the cause is internal or external) and (b) the level of controllability (i.e., the degree to which the cause is due to individual, volitional influence) (Weiner, 1985, 1986). The two causal dimensions are thought to guide affective and behavioral reactions to an event or stigmatized individuals (Zucker, 1999). An internal locus (i.e., inferences that a person's disposition is caused by that person's characteristics) reflects something about the person, whereas an external locus (i.e., inferences that a disposition is caused by contextual factors) reflects something about the situation (e.g., McAuley, Duncan, & Russel, 1992; Russell, 1982).

Until recently, the personal (or internal) attribution approach has been the dominant focus of initiatives seeking solutions to obesity. Public communication campaigns often focus on educating individuals to adopt healthier diet and increase physical activities to control weight through their emphasis on individualism in culture and politics (Brownell et al., 2010). News reports have also contributed to this dominant view by framing stories in a way that suggests that weight is largely within individual control through decisions about exercise and diet (Kim & Willis, 2007). People tend to over-value dispositional or internal explanations for the actions or dispositions of others, while under-valuing situational explanations (the fundamental attribution error; see Block & Funder, 1986). As a result of such personal attribution approaches to obesity, numerous weight-based stereotypes have emerged, blaming the obese and making obese people frequent targets of bias, stigma, and discrimination (e.g., Oliver & Lee, 2005; Puhl & Heuer, 1998).

Increasingly, public health researchers and advocates have emphasized the importance of addressing social determinants of obesity, including nonmedical, social, economic, political and environmental factors, in efforts to encourage support for societal interventions (e.g., policy changes) to reduce obesity (Gollust, Lantz, & Ubel, 2009; Kumanyika et al., 2008; Sallis et al., 2006). Since attributions of responsibility exert a strong influence on public support for societal interventions (Iyengar, 1989), it is crucial to increase public awareness of the broad range of societal and environmental factors that shape obesity, as opposed to an exclusive focus on personal choices and health-related behaviors (e.g., Niederdeppe et al., 2008).

Message framing, or the intentional emphasis on some aspects of an issue (Entman, 1993), has been used to influence how people think about responsibility for causing social problems, responsibility for addressing these problems, and ultimately what policies should be implemented to address them (Iyengar 1991; Niederdeppe et al., 2008). For example, studies have found that messages emphasizing external or uncontrollable causes of obesity (e.g., neighborhood facilities and genetic factors) have led to higher perceptions of societal responsibility to solve obesity (Major, 2009) and increased intentions to offer help to the obese (Jeong, 2007). However, most of the messages used in these studies have framed causes for obesity as *either* episodic (individual/internal) or thematic (societal/external). While it is often recognized that both individual and environmental factors are influential in the development of obesity, addressing both personal and societal causes of obesity (a two-sided message) may result in different patterns of responses than a one-sided message. It is possible that too much emphasis on personal causes of obesity may risk priming audiences to activate their preexisting beliefs about individual responsibility (Niederdeppe et al., 2011). It is also possible, based on the evidence supporting the assertion that refutational two-sided messages are superior to other approaches (O'Keefe, 1999), that the absence of explicit acknowledgement of personal responsibility could increase resistance to messages emphasizing societal responsibility.

While the public health community has long acknowledged the need for programs that integrate both individual choice and collective responsibility (e.g., Brownell et al., 2010), one challenge to these efforts has been the lack of knowledge on how people perceive messages that combine the two approaches. We pose our first research question to examine the extent to which acknowledging personal responsibility, when highlighting societal causes for obesity, changes attributions.

> *Research question 1*: Do messages emphasizing differing levels of personal responsibility change readers' causal or solution attributions for obesity?

The Use of Narratives to Address Causal Attributions for Obesity

Narratives represent a potentially fruitful message strategy for exploring this research question. Numerous scholars have explored the role of personal stories in shaping opinions, attitudes and behavior related to health risks (e.g., Hinyard & Kreuter, 2007; Kreuter et al., 2007). Narratives have been widely used in public campaigns that address health and risk issues (Slater, 2002). While some scholars suggest that narratives often frame social problems in terms of individual causes and solutions (Gamson, 1992; Iyengar, 1991), others argue that personal stories can be effective for addressing structural causes for social problems (e.g., Niederdeppe et al., 2008; Strange & Leung, 1999).

There are several possible advantages of using narratives over other message strategies for addressing social issues characterized by a complex set of causal factors like obesity. Personal stories are thought to increase readers' message recall and comprehension, and to facilitate attitude and behavior changes by transporting their mind into the story itself (Green & Brock, 2002; Kreuter et al., 2007). Narratives provide unique opportunities for readers to connect with particular social groups that are represented by narrative characters (Dal Cin, Zanna, & Fong, 2004). Strange (2002) has suggested that these connections could change the attribution of responsibility for the causes of and the solutions for social issues that influence populations depicted in these stories (also see Strange & Leung, 1999). For example, one study found that empathizing with a narrative character (i.e., a member of a stigmatized group) improved attitude toward the group as a whole, indicating that narratives can improve support for collective actions to solve social issues associated with the stigmatized group (Batson et al., 1997). Also, narratives may be able to involve readers in the story without drawing attention to persuasive aspects of the message (Dal Cin et al., 2004). This aspect of narrative may help to overcome resistance to persuasion (Deighton, Romer, & McQueen, 1989), which often discourages readers from finding things to disagree with while encouraging story-consistent beliefs (Green & Brock, 2000).

Caution should be paid when using narratives in persuasion (Niederdeppe et al., 2008), as negative emotional responses to a character (like anger or frustration) could result in a counterproductive effect in the reception of the story (e.g., Kamp & MacInnis, 1995). Our study builds upon these findings by examining emotional and attributional reactions to narratives that depict different levels of personal responsibility for a character's weight control.

The Attribution-Emotion Model of Stigmatization

To investigate processing of narratives about obesity, the Theory of Perceived Responsibility and Social Motivation (Weiner, 1993) provides a useful perspective for identifying cognitive and affective precursors to support for societal solutions to reduce obesity. The Attribution-Emotion Model (Weiner, 1996), which incorporates the Theory of Perceived Responsibility and Social Motivation, has been used to link causal attributions, affective reactions, and help judgments (both personal and governmental through policy support) for stigmatized individuals such as mentally ill, cancer patients, handicapped individuals, AIDS patients, pregnant adolescents, and obese people (e.g., Zucker & Weiner, 1993; Zucker, 1999). Weiner (1993) conceptualized controllability as "the capacity to volitionally alter a cause (p. 959)," and this causal property has been suggested as a major determinant of subsequent responsibility judgments and blame toward stigmatized individuals (Morse, 1992). People who are perceived to suffer due to personally controllable causes are considered more responsible for their conditions than those who suffer from conditions deemed to be out of their control. As a result, individuals whose conditions are perceived to be within their control are subject to moral condemnation for their lack of effort (Weiner, 1993). For example, obesity due to overeating (a controllable cause) is evaluated more negatively than obesity based on genetic (uncontrollable) causes (e.g., Crandall & Biernat, 1990). Accordingly, we offer the study's first hypothesis:

> *Hypothesis 1:* Perceived controllability for obesity will be positively associated with blame toward a narrative character that has weight problems.

The locus of control, another causal dimension, is also closely related to blame toward stigmatized individuals (Weiner, 1993). That is, more blame is directed toward a stigmatized individual when people internally attribute causes for the condition (e.g., low individual effort). Yet, when people attribute causes of a disposition to external causes (e.g., environmental factors), they direct less blame toward the individual. In light of this prediction, we pose two hypotheses:

> *Hypotheses 2 and 3*: Blame toward a narrative character will be positively associated with individual cause attributions for obesity (H2) and negatively associated with societal cause attributions for obesity (H3).

External locus of control (i.e., societal cause attributions) is associated with higher societal solution attributions and support for policies to address obesity, while internal locus of control (i.e., individual cause attributions) predicts lower levels of policy support (e.g., Niederdeppe et al., 2011; Barry, Brescoll, Brownell, & Schlesinger, 2009). Judgments of

responsibility (or blame) have been considered an important mediator between causal attributions and other cognitive, affective, and behavioral reactions (Weiner, 1996; Zucker, 1999). In particular, studies in help giving have documented the important role of responsibility judgments (e.g., Weiner, 1993). These investigations commonly find that responsibility and blame are negatively related to help-giving, both in terms of individual behavior (e.g., helping an obese person) and societal solution attributions (e.g., supporting policies that would help to reduce obesity). For instance, Weiner and Zucker (1993) found a direct, negative path between perceived responsibility and support for governmental welfare to help the poor. The perception that society bears responsibility for addressing the problem of obesity is predicted by societal cause attributions and is closely linked to support for public policies (Niederdeppe et al., 2011). Based on these findings, we offer the following hypothesis about the relationship between blame toward a narrative character and societal solution attributions:

> *Hypothesis 4*: Blame toward a narrative character will be negatively associated with societal solution attributions for obesity.

Emotional responses are thought to develop immediately following the interpretation of blame and causal attributions of responsibility (Weiner, 1986). Scholars have commonly investigated two emotional responses in relation to judgments about stigmatized individuals and subsequent help decisions: anger and sympathy. In numerous studies, blaming individuals for a disposition tends to trigger anger, while sympathizing with individuals is negatively associated with blame (Zucker, 1999, Zucker & Weiner, 1993). For example, one study testing the Attribution-Emotion Model used narratives to manipulate valence of behavioral causes (i.e., whether the cause of the character's disposition was within that character's control) of 10 stigmas, including obesity (Dijker & Koomen, 2003). Both sympathy and anger were induced as a function of the locus of the causal attribution. Similar patterns should exist for narratives that depict characters who take different levels of personal responsibility for weight control. We propose two hypotheses to test the relationships between blame, anger and sympathy:

> *Hypotheses 5 and 6*: Blame will be positively associated with anger toward a story character (H5) and negatively associated with sympathy toward the story's character (H6).

The Attribution-Emotion Model predicts a negative relationship between anger and help giving and a positive association between sympathy and help-giving. Sympathy has been found to increase desire to help those who are in need through charitable donations, physical assistance or governmental welfare because another person's suffering tends to

evoke an altruistic tendency (e.g., Batson, 1987; Dijker & Koomen, 2003; Zucker & Weiner, 1993). The pattern is less clear for anger – not all studies have found anger to directly influence help judgments or societal solution attributions (e.g., Dooley, 1995; Menec & Perry, 1998; Zucker, 1999), suggesting that help-giving is primarily determined by sympathy rather than anger. It is possible that sympathy is a more immediate and salient response to a stigmatized person than is anger (Menec & Perry, 1998). In light of this mixed pattern of findings, we pose a research question to investigate the association between emotional reactions toward a narrative character and societal solution attributions to reduce obesity rates.

Research Question 2: Do anger and sympathy toward a narrative character relate to societal solutions for obesity?

Finally, based on the full set of predictions of the Attribution-Emotion Model (Weiner, 1996) described above, we propose a path model to explain cognitive and affective processing of narratives designed to increase support for societal solutions to reduce obesity (Figure 1).

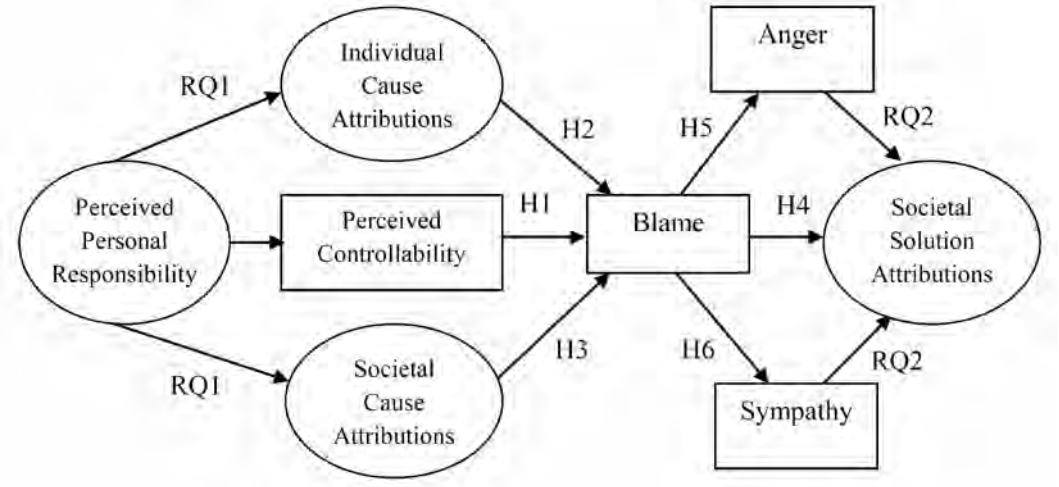
METHOD

Procedure and Stimuli

We conducted a between-subject experiment in which participants were randomly assigned to one of three narratives which, while focusing on societal causes and solutions for obesity, portrayed a main character who acknowledged varying levels of personal responsibility for weight control (i.e., high, medium, and low). Each message was audio recorded, enabling participants to listen to the message through headphones, while following along through on-screen text. Experimental administration required, on average, approximately 20 minutes. The study was approved by the university's Institutional Review Board (IRB).

Message conditions. Three narrative stories depicted a main character, named Michele, who was at high risk of developing diabetes and high blood pressure but had recently lost 11 pounds. We focused on local community level interventions, rather than national or federal level solutions, for addressing societal responsibility to obesity. Thus, each narrative contained identical content related to societal involvement in transforming the character's neighborhood into a healthier place by increasing opportunities for safe physical activity, increasing availability of fresh produce, and lowering the costs of healthy food.

Figure 1. Proposed Model of Obesity Narrative Processing



The three narrative conditions differed in their portrayal of the character's personal commitment to weight control. The high personal responsibility condition emphasized personal decisions and efforts to control the character's weight through statements such as, "After struggling with her weight, she has dropped 11 pounds by counting calories, controlling portions, and adopting a diet that moves away from carbohydrates and toward fruits and vegetables… Michele has always believed that it is her own personal responsibility to be healthy, but it hasn't been easy." In the low personal responsibility condition, the character doesn't admit personal efforts to control weight stating, for example, "I haven't been trying to lose weight, I guess it just happened. I haven't changed my diet, gone to the gym, or tried to change my habits in any way." In the medium personal responsibility condition, the character acknowledges struggling with weight control, but notes that it hasn't been easy, stating, "I had a hard time finding what I needed for my diet. Plus, there were so many cheap and delicious food options in my neighborhood that require little to no preparation at home." (see Appendix A for each message).

Participants

Student participants were recruited from undergraduate courses and in a public location at a large, northeastern university and invited to a nearby booth set up for the experiment. In the first data collection, we found no significant manipulation difference between the low (n = 24) and medium (n= 26) responsibility conditions, while the medium condition significantly differed from the high responsibility condition (n= 25). Thus, we

modified the low responsibility condition and, as a second round of data collection, randomly assigned participants to one of three responsibility conditions (n = 62). Manipulation was successful in the second data collection (reported in the result). We combined the two datasets while excluding the low responsibility condition in the first collection, resulting in an analytic sample of 113 participants.

Respondents consisted of 69% women (n = 78) and 31% (n = 35) men. Ages varied from 18 to 50, with an average of 21. Of the respondents, 11% (n = 12) were freshmen, 24% (n = 27) were sophomores, 29% (n = 33) were juniors and 32% (n = 36) were seniors. Nearly three-fourths (n = 81; 72%) self-identified as White, 22% (n = 25) identified as Asian/Asian-American, and 6 % (n = 7) identified as Black, Hispanic or multiple races.

Measures

Manipulation check: Perceived personal and societal responsibility. Six items examined whether manipulated conditions induced different levels of perceived personal responsibility while holding perceived societal responsibility consistent. On a 5-point Likert scale (1 = strongly disagree; 5 = strongly agree), participants reported the extent to which the story (1) emphasizes the role of Michele's personal decisions in her weight loss, (2) emphasizes the role of Michele's neighborhood in her weight loss, (3) suggests that Michele is personally responsible for losing weight, (4) suggests that society is responsible for helping Michele to lose weight, (5) suggests that losing weight is under Michele's control, and (6) suggests that weight loss is outside of Michele's control. Items (1), (3), and (5) were intended to measure perceived personal responsibility, while (2), (4) and (6) were intended to measure perceived societal responsibility. Cronbach's alpha for the perceived personal responsibility items was .70 (average M = 3.31, SD = .78). Item (6) was excluded when responses were averaged into an index of perceived societal responsibility due to low reliability (bivariate correlation = .39, p< .001; average M =3.95, SD = .73).

Perceived controllability and blame. Referencing items developed by Weiner (1993, 1995), blame and perceived controllability were measured as follows: (1) blame: How much do you blame Michele for her circumstances? (7-point; 1 = hardly any; 7 = a great deal; M = 3.8, SD=1.38), and (2) controllability: How controllable is the reason for Michele's weight struggle? (5-point; 1 = strongly uncontrollable, 5 = strongly controllable; M = 3.55, SD=.94).

Emotional responses. Two items were adapted from Weiner (1993, 1995) to measure emotional responses toward the character (both on 7-point scales; 1 = hardly any; 7 = a great deal): (1) How much anger do you feel toward Michele? (M = 1.67, SD=1.10), and (2) How much sympathy do you have for Michele? (M = 4.13, SD=1.60).

Individual cause attributions for obesity. On a Likert scale from 1 = strongly disagree to 5 = strongly agree, participants reported on three statements about personal causes of

obesity adopted from previous surveys (e.g., Oliver & Lee, 2005, Harvard School of Public Health, 2003): (1) Most people lack the willpower to diet regularly, (2) Most people lack the willpower to exercise regularly, and (3) Most overweight people lack self-control. Cronbach's alpha for these items was .76 (3 items; average M = 2.62, SD=.70).

Societal cause attributions for obesity. We also used three items, derived from opinion polls, to measure societal cause attributions (Oliver & Lee, 2005, Harvard School of Public Health, 2003). Participants were asked to indicate the extent to which they agree with three statements (1 = strongly disagree; 5 = strongly agree): (1) There are not enough healthy food options in restaurants and supermarkets, (2) There are not enough safe and affordable places for people to exercise, and (3) Healthy food is too expensive for many people. Cronbach's alpha was .67 (3 items; average M = 3.19, SD=.91).

Societal solution attributions for obesity. Participants were asked to report on the extent to which they think each of the following groups bears responsibility for addressing the problem of obesity in the U. S.: (1) Government, (2) Community organizations, and (3) Restaurants and supermarkets that serve unhealthy foods (1 = hardly any; 4 = a great deal). Items were adopted from the same sources as the personal and societal cause items. Cronbach's alpha for the three items was .60 (average M = 2.62, SD=.70).

RESULTS

Manipulation Check

To examine whether experimental manipulations were successfully induced, we performed a one-way analysis of variance (ANOVA) and conducted pairwise t-tests with a Bonferroni correction. The main character in each narrative condition was perceived to have had different levels of personal responsibility for her weight control, $F(2, 110) = 17.26$, $p < .001$. On the contrary, the level of societal responsibility was kept consistently high across conditions as designed, $F(2, 110) = 1.68$, $p = .19$. The main character in the high personal responsibility condition was perceived as taking more individual responsibility (M = 3.70, SD = .65) than the main character in the medium condition (M = 3.22, SD = .65). The low personal responsibility condition had the lowest personal responsibility score (M = 2.65, SD = .81). Each pairwise t-test was statistically significant at $p< .01$. Thus, the experimental manipulation was deemed successful.

Addressing RQ1

To assess the influence of manipulated personal responsibility on causal and solution attributions, we performed a series of one-way ANOVAs and pairwise t-tests with a

Table 1. Cause and Solution Attributions by Condition ($N = 113$)

	Randomized Level of Personal Responsibility				
	High (n=45) *M (SEM)*	*Medium*(n=48) *M (SEM)*	*Low*(n=20) *M (SEM)*	*F*	*df*
Individual Cause Attributions	3.64 (.12)	3.68 (.12)	3.37 (.15)	1.16	2,110
Societal Cause Attributions	3.13 (.14)	3.12 (.13)	3.50 (20)	1.44	2,110
Societal Solution Attributions	2.62 (.10)	2.48 (.10)	2.95 (.17)	3.28*	2,110

Notes. Individual and societal cause attributions were measured with a 5-point scale (higher values = stronger causal attributions); societal solution attributions were measure with a 4-point scale (higher values = stronger solution attributions).
*denotes $p < .05$

Bonferroni correction (when the ANOVA revealed significant overall differences). The medium personal responsibility condition (M = 2.48, SEM =.10) produced significantly lower societal solution attributions than the low personal responsibility condition (M = 2.95, SEM =.17), while the high personal responsibility condition (M = 2.62, SEM =.10) did not differ from other conditions, overall model $F(2,110) = 3.28$, $p = .04$. Neither individual nor societal cause attributions for obesity differed as a function of randomized condition (Table 1).

Preliminary Correlation Analysis

We next examined relationships between perceived personal responsibility (PPR) and narrative processing variables (i.e., controllability, blame, emotional responses, and attributions for obesity) using bivariate correlations. We focused on PPR in subsequent analyses, not perceived societal responsibility or randomized conditions, because PPR was (a) strongly related to the experimental manipulation and (b) measured as a continuous variable to permit interval-level statistical analyses (e.g., correlations) and latent-variable modeling, as described below.

Contrary to the model described in Figure 1, only perceived controllability was significantly associated with the level of PPR (r = .32, $p < .001$). PPR was not directly associated with the perception that obesity is caused by individual factors (r = .04, p = .65)

or societal factors (r = -.05, p = .59). The significant pathway between perceived controllability and PPR was retained in subsequent models. Table 2 reports descriptive statistics and correlation results.

Latent Path Modeling

To examine research questions and hypotheses, we used structural equation modeling (SEM; AMOS 6.0) because several model constructs (e.g., PPR; individual and societal cause attributions for obesity) were measured with multiple items. We estimated parameters using maximum likelihood methods and followed a two-step process of latent path modeling (i.e., confirmatory factor analysis and structural model testing).

Confirmatory factor analysis. Testing an overall measurement model, all latent variables and measured variables were allowed to covary. To examine the data model fit, we used three fit indexes including *Chi-square*/df, Comparative Fit Index (CFI) and Root Mean Square Error of Approximation (RMSEA). A model has a sound model fit when the value of (a) *Chi-square*/df is less than 3, (b) *CFI* is equal to or greater than .90, and (c) *RMSEA* is equal to or less than .08 (Byrne, 2001; Kline, 1998). Using this guideline, the CFA model was valid, indicating good inter-item measurement reliability: *Chi-square*/df = 1.21, *CFI* = .94 and *RMSEA*= .04. All factor loadings were significant at p< .001 and standardized solutions ranged from .44 to .85.

Structural model testing. As a second step, structural paths were constructed based on the proposed model (Figure 1) and the results of preliminary analyses (removing paths from PRR to causal attributions). A slightly-revised structural equation model (removing the path from societal cause attributions to blame and adding a direct path to societal solution attributions) yielded a good data-model fit: *Chi-square*/df = 1.19, *CFI* = .93 and *RMSEA* = .04. Thus, the proposed model was a valid model that explained patterns of relationship between model constructs in the processing of narratives that addressed both personal and societal causes of obesity.

PPR predicted higher perceived controllability of obesity (*beta* = .40, *B* = .67, *S.E.* = .23, p = .004). That is, when reader perceives that a story suggests that the main character was personally responsible for losing weight, the reason for character's weight struggle is perceived to be under more control by the character. Perceived controllability was, in turn, a significant predictor of blame toward the character (supporting H1: *beta* = .19, *B* = .28, *S.E.* = .13, p = .03). The perception that obesity is caused by individual factors positively predicted reader's blame toward the character (supporting H2: *beta* = .40, *B* = .64, *S.E.* = .16, p < .001). While societal cause attributions for obesity were not associated with blaming the character (rejecting H3), they were directly related to the perception that society should address the obesity issue (*beta* = .29, *B* = .20, *S.E.* = .10, p < .05). Blaming the narrative character was negatively associated with societal solution for obesity issue (supporting H4:

Table 2. Descriptive Statistics and Correlations of the Model Constructs

	M	*SD*	1	2	3	4	5	6	7
1. PPR	3.31	.78							
2. IC	3.61	.79	.04						
3. SC	3.19	.91	-.05	-.45***					
4. Control	3.55	.94	.32**	.07	.05				
5. Blame	3.81	1.38	.05	.34***	-.30**	.22*			
6. Anger	1.67	1.10	-.04	.20*	-.24*	.02	.24*		
7. Sympathy	4.13	1.60	-.06	-.28**	.28**	-.08	-.21*	-.04	
8. SS	2.62	.70	-.07	-.19*	.22*	-.03	-.25**	-.02	.22*

Notes. PPR = Perceived personal responsibility (3 indicators); IC = Individual cause attributions (3 indicators); SC = Societal cause attributions (3 indicators); SS = Societal solution attributions (3 indicators); *$p < .05$, **$p < .01$, ***$p < .001$.

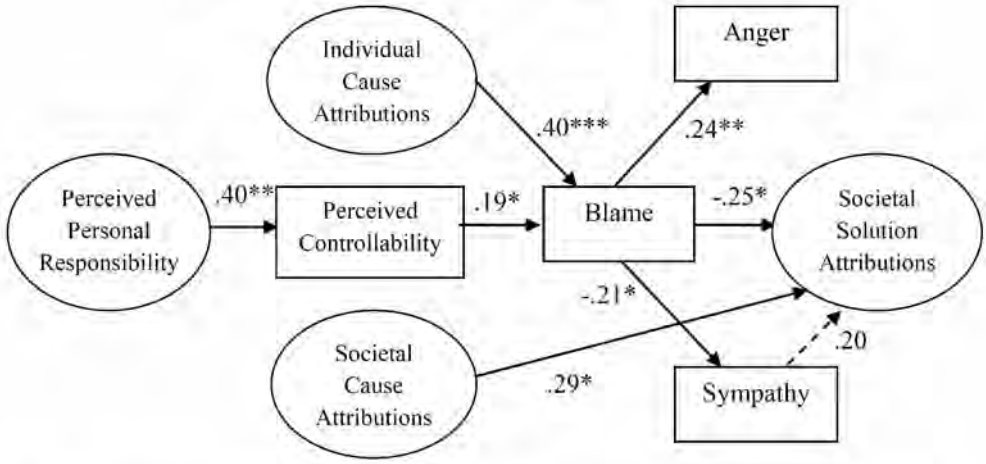
beta = -.25, *B* = -.10, *S.E.* = .05, $p < .05$). Blame toward a narrative character was positively associated with anger (supporting H5: *beta* = .24, *B* = .19, *S.E.* = .07, $p = .009$) and negatively with sympathy (supporting H6: *beta* = -.21, *B* = -.25, *S.E.* = .11, $p < .05$). Thus, all hypotheses, except H3, were supported.

Addressing RQ2, anger toward a narrative character did not predict societal solution attributions, while sympathy was only marginally related to societal solution attributions for obesity (*beta* = .40, *B* = .07, *S.E.* = .04, $p = .09$). Figure 2 presents the final latent path model of obesity narrative processing (non-significant paths deleted).

DISCUSSION

This study had two primary goals: to shed light on (1) how people respond to narratives that combine information about individual and societal responsibility in an effort to promote public support for interventions to reverse the obesity epidemic, and (2) how narrative health messages that involve complex causal factors are processed by audiences. Using the Attribution-Emotion Model of Stigmatization (Weiner, 1996), we examined the relationship between readers' responses to a narrative character who had struggled with

Figure 2. Final Model of Obesity Narrative Processing



Notes. Only paths of *p* value less than .10 are presented (dotted line denotes $p < .10$, $*p < .05$, $**p < .01$, $***p < .001$). Circles represent latent variables and rectangles represent measured variables. Indicators for latent variables and errors for the indicators are excluded from the figure.

weight problems and their support for societal solutions to reduce obesity rates. This study reports three major findings that have both theoretical and practical implications for a public health topic characterized by individual- and societal-level causes and possible solutions.

First, Brownell et al. (2010) and other public health advocates have argued that successful efforts to reduce obesity rates in the U.S. will need to address both individual choices and collective responsibility. To provide a first step toward understanding how to best combine the two approaches, our first research question looked at whether varying levels of personal responsibility in narrative messages would change perceptions of who is responsible for causing and solving the obesity while societal solutions are being highlighted. Interestingly, the highest levels of societal solution attributions were observed when the narrative's main character took little or no personal responsibility for her weight loss. Latent path models indicate that when a character is perceived as taking strong personal responsibility for her own weight loss, she is more likely to be viewed as personally responsible for controlling own weight by making decisions to diet and exercise, which (through both a cognitive and emotional process) appears to undermine support for societal solutions to the obesity epidemic.

Although all messages tested in this study were aimed at raising awareness of societal causes and solutions to obesity, our findings suggest that too much acknowledgement of

personal responsibility for weight control may invite readers to confirm their previously held beliefs about individual determinism and obesity. Scholars have argued that the concept of personal responsibility is closely related to American culture and politics that emphasize individualism (Brownell et al., 2010; Gollust et al., 2009). Related to this, public opinion studies have found that the majority of Americans believe individual's behavioral shortcomings are the primary causes of obesity and poor health (e.g., Bleich & Blendon, 2010). Given that many Americans strongly value personal responsibility, Gollust et al. (2009) pointed out that such views may conflict with the language and values of public health, suggesting that it might be important to acknowledge individual responsibility to reduce resistance to messages that emphasize societal interventions (especially, for those who have a worldview that values individual responsibility).

The results of our study do not support this proposition; instead, we have found that highlighting individual responsibility could have unintended effects and potentially undermine support for broader, societal efforts to reduce rates of obesity in the U.S. While the effect size was not large, latent path models suggest that this relationship is explained by the fact that high levels of perceived personal responsibility in a message increased perceived controllability and blame toward a narrative character. In other words, narratives that acknowledge high levels of personal responsibility for obesity and weight loss run the risk of increasing the belief that obesity is personally controllable issue and that individuals should be blamed for their own weight status. These unintended effects should be taken into account when designing messages to improve public support for collective interventions to reduce obesity, especially considering that our high responsibility condition is similar to strategies being adopted in existing public communication campaigns on the obesity topic.

Second, readers' causal attributions for obesity both directly and indirectly influenced their levels of support for societal solutions to reduce obesity. The character's level of personal responsibility (via the experimental manipulation) did not change viewers' perceptions about whether obesity is *caused* by individual or societal factors, suggesting that these perceptions may be relatively stable beliefs based on individuals' value systems such as individualism, self-determination, and political conservatism (e.g., Brownell et al., 2010). Yet, these perceptions had a meaningful influence on viewers' support for societal interventions. The perception that obesity is caused by personal shortcomings was positively associated with blame toward a narrative character, which in turn decreased support for societal interventions. On the other hand, the perception that obesity is caused by societal factors was directly associated with support for societal solutions. Future studies should continue to identify message factors that help increase societal cause attributions while reducing the negative influence of individual cause attributions.

Third, emotional reactions triggered by attributional judgments about the causes of obesity shaped support for societal interventions to reduce obesity, replicating the results of previous studies based on Attribution-Emotion Model (e.g., Weiner, 1996; Dijker&

Koomen, 2003; Menec & Perry, 1998). Blame toward a narrative character was found to increase anger and reduce sympathetic reactions toward the character. Scholars who study the relationship between emotional reactions and help judgments have suggested that sympathy is a more proximal predictor of help judgment than is anger (e.g., Dijker& Koomen, 2003; Menec & Perry, 1998; Weiner, 1996). That is, previous studies have commonly observed non-significant relationships between anger and help judgments, while finding significant positive relationships between sympathy and help judgments (e.g., Dooley, 1995; Menec & Perry, 1998). Empathy toward a character in an obesity-related narrative, which includes both cognitive and affective components, may be closely related to beliefs about societal causes and societal solutions to address rates of obesity (Campbell & Babrow, 2004; Batson et al., 1997). While the path coefficient from sympathy to societal solution attributions was only marginally significant in the final latent path model ($p = .09$), we did find a significant bivariate association between sympathy and societal solution attributions ($r = .22$, $p < .05$). Support for societal solution attributions for obesity was more strongly associated with sympathy than anger, reinforcing the proposition that sympathy may be a more immediate and salient response to a stigmatized person.

Study Limitations

Several limitations to the present study should be acknowledged. First, the number of participants was not balanced between experimental conditions (i.e., high and medium conditions had more participants than the low personal responsibility condition) due to the manipulation failure in the first data collection (reported in the participant section). While it would have been ideal to have a balanced number of participants across conditions, we do not believe this lack of balance impacted the results of this study because (1) the manipulation check items (measured using a Likert-type scale) were used in the latent path analysis, and (2) the mean scores of outcome variables had similar variances across different conditions.

This study is based on a student sample, thus the results should be cautiously generalized to other populations. Several scholars have suggested that political partisanship is an important factor that shapes responses to messages that emphasize societal responsibility for causing and addressing public health problems (e.g., Gollust et al., 2009; Niederdeppe et al., 2011). We were unable to examine this possibility, as students' political partisanship was not measured because of the limited number of questions we were able to include in the questionnaire. It is possible that the study sample was disproportionately liberal or conservative, and this factor could have influenced the results of this study. Future work should continue to investigate the role of political orientation in shaping responses to obesity and other public health narratives to provide a deeper understanding about these issues.

This study used single items to measure several study variables including controllability, blame, anger and sympathy. Even though these measures were consistent with previous studies based on the Theory of Perceived Responsibility and Social Motivation (Weiner, 1993, 1995), the use of single items is susceptible to measurement error. Also, some outcome measurements including societal causes and solutions had low inter-item reliability. In future studies, multi-item measures should be used to provide stronger tests of relationships between study variables.

Conclusion

This study provides initial evidence that narratives designed to improve support for societal solutions to obesity may run the risk of increasing perceived controllability and blame toward a narrative character when the message acknowledges too much individual responsibility. Public health practitioners should consider this counterproductive effect of narrative when designing persuasive messages to enhance support for collective interventions to reduce obesity.

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Appendix A

Meet Michele Wolfe [H = High Personal Responsibility, M = Medium, L = Low]

[H] Michele, 41, was at high risk of developing diabetes and high blood pressure - probably due to a combination of genetics, personal choices, her environment, and finances, she says.

[M and L]: Michele, 41, was at high risk of developing diabetes and high blood pressure - probably due to a combination of genetics, her environment, and finances, she says.

[H and M]: In her family, hearty, inexpensive foods were the suppertime staples. One night they would have spaghetti and meatballs, the next night macaroni and cheese. Her grandmother cooked plenty of pork too. And when it came to exercise, getting outdoors was a risky proposition in crime-ridden, traffic-congested neighborhoods with few safe parks and playgrounds.

[L]: In her family, hearty, inexpensive foods are the suppertime staples. One night they have spaghetti and meatballs, the next night macaroni and cheese. Her grandmother cooks plenty of pork too. And not long ago, getting outdoors was also a risky proposition in her once crime-ridden, traffic-congested neighborhood with few safe parks and playgrounds.

[H]: After struggling with her weight, she has dropped 11 pounds by counting calories, controlling portions, and adopting a diet that moves away from carbohydrates and toward fruits and vegetables.

[M]: After struggling with her weight, she has dropped 11 pounds. But it hasn't been easy.

[L]: Recently, however, Michele has dropped 11 pounds, and she didn't even realize it.

[H]: Michelle has always believed that it is her own personal responsibility to be healthy, but it hasn't been easy. "At first, I didn't know how to cook a lot of healthy things," she says. "The healthier stuff was always more expensive and less likely to fill me up," says Michele, "Plus, there are so many cheap and delicious food options in my neighborhood that require little to no preparation at home, they were just easier."

[M]: "I had a hard time finding what I needed for my diet. Plus, there were so many cheap and delicious food options in my neighborhood that require little to no preparation at home. Also, getting out and exercising was tough. The neighborhood was very congested and car-centric," she recalls. "You couldn't get anywhere without driving."

[L]: "I haven't been trying to lose weight, I guess it just happened. I haven't changed my diet, gone to the gym, or tried to change my habits in any way. I don't have time to count calories or prepare special 'healthy' meals. Truth be told, I'm really not concerned with my weight, but I guess I'm glad I lost it."

[H and M]: Fortunately, she's gotten help. The Neighborhood Development Association (NDA) has helped transform Michele's neighborhood, making her a big believer that one's environment influences physical and emotional well-being.

[L]: Many people like Michele don't have the time or energy to adopt major lifestyle changes. Instead, community organizations are doing what they can to help improve the health of people, who, like Michele, don't place healthy diet and regular exercise at a very high priority.

One group, the Neighborhood Development Association (NDA), has helped to transform Michele's neighborhood. She thinks these changes are responsible for her weight loss.

[H and M]: NDA has brought a new supermarket and farmer's market into the neighborhood. These neighborhood resources improve the availability of fresh fruits and produce and make it easier for people like Michele to shop for healthy foods. In addition, NDA's development of jogging-biking trails, public parks, and a new playground has increased residents' opportunities for safe physical activity.

[L]: NDA's development of jogging-biking trails, public parks, and a new playground has increased residents' opportunities for safe physical activity. They have also changed people's daily routines.

[H]: "I'm getting much more regular exercise than I used to," she says. "I can push myself to get the quality of exercise I need. Physical activity is also built into my routine."

[M]: "I'm getting more regular exercise than I used to," she says. "I don't need to push myself quite as hard to get the quality of exercise I need, because it's built into my routine."

[L]: "The neighborhood definitely looks nicer since NDA's renovation. However, it has changed my commute. Because of all the green spaces there are less parking spots so now I walk about eight blocks on my way to work and on my way home."

[H and M] Thanks to NDA, Michele now lives in a true community – where neighbors look out for each other and residents place importance on projects such as landscaping and recycling.

[L] Thanks to NDA, Michele now lives in a true community.

[H] Here, she feels comfortable getting out of the house and exercising outside – activities Michele sees as tremendously important for improving her health. This has helped Michele to develop healthier lifestyle habits.

[M]: Here, she feels more comfortable getting out of the house and getting outside. This has helped Michele to have more options for improving her health – even though following through on them is often a challenge.

[L]: Here, she feels more comfortable getting out of the house, even if she's not intending to exercise.

[H]: "I look for the specials." she says, "Eight peppers to a bag or a $1-a-bag special that week."

[M]: "A bag of apples is $2, but I can get a burger and fries for about the same price," Michele says. "When money is tight, I have to think about what is going to fill me up."

[L]: "Juggling work, my family, and the finances, I don't have the time or the energy to plan my meals ahead of time or squeeze in a workout. I'm concerned with providing for my family, so I can't be jogging around town."

[H]: Along the way, Michele has gotten her friends and family involved too. She and her co-workers now share recipes for all sorts of healthy foods, like spinach, squash, cabbage, and collard greens. Her children participate in the shopping and cooking too, Michele says, expanding their food repertoire while also keeping mom healthy.

[M]: Along the way, Michele has gotten help from her friends and family. Her co-workers offer her recipes for all sorts of healthy foods, like spinach, squash, cabbage, and collard greens. Her children participate in the shopping and cooking too, Michele says. "It is so expensive compared to the types of foods I've eaten all my life. Pasta, rice, potatoes, and things like that are cheaper and can last you the whole week," she says. "When you're trying to put food on the table, it's hard to keep my family full and stick to a budget."

[L]: Despite Michele's busy schedule, NDA has made some changes that have improved her diet, as well. NDA has brought a new supermarket and farmer's market into the neighborhood. These resources improve the availability of fresh fruits and produce and make it easier for Michele and her neighbors to access cheap and healthy foods. "I'm not about to spend more money for less food, even if it's healthier, if we are not going to enjoy it. It just makes sense for us to eat things we like and save money at the same time. However, my family does like some types of vegetables, so, because they're cheaper at the new supermarket and I pass it on my way home, I'm buying them a bit more often."

[H]: "I won't say it's been easy – there have been many challenges along the way. Still, it's my responsibility to keep myself and my family healthy and to not make excuses," Michele says. "What NDA has done for the neighborhood has been a huge boost."

[M]: "It's been hard. It's the responsibility of the entire community to create a healthier neighborhood for people living here, and my responsibility to take advantage of it. Michele says. "What NDA has done for the neighborhood has been a huge help."

[L]: "It's the responsibility of the community to create a healthier neighborhood for the people living here," Michele she says. "I have other things to worry about – like paying the bills and feeding my family."

[H and M]: With help from NDA, Michele is now on the path to better health.

[L]: Even though Michele hasn't made her own health a priority, NDA is doing their part to positively influence her well-being.

COMPARING FREQUENCY OF ONLINE NEWS COVERAGE, WORLDWIDE MORTALITY AND PERCEIVED RISK OF LEADING DISEASES AND INJURIES: CHALLENGING PARADIGMS IN THE NEW MEDIA LANDSCAPE

MARIA ELENA VILLAR AND RODRIGO ZAMITH

Mass media are a leading source of health information for the public. Based on the theory of agenda setting, the media influence what users consider important with respect to health and disease. This study examines the frequency of health issues covered by major national online media outlets, worldwide mortality and the public's perception of risk. Frequency of media coverage was found to be correlated with both worldwide mortality and with perceived personal and societal risks for specific diseases and injuries. This suggests that online media news coverage is in line with the public's agenda with respect to health risk, and further corresponds to global mortality. Results also show that for all causes of death, the public's perception of risk to self is significantly lower than the perceived risk to society. Study limitations and implications are discussed.

Keywords: health news, online news, agenda setting, global mortality, perceived risk.

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Over the past decade, Americans' pursuit of health information has drastically shifted and now occurs within a widening network of both online and offline sources, with recent studies finding the Internet to be a main source of health information (Hesse et al., 2005). Indeed, those who use the Internet – which now includes four-fifths of all Americans (Pew Research Center, 2009) – are just a click away from the world's biggest medical library, which includes more than 100,000 health-related websites (Dearness & Tomlin, 2001). Such access affords an array of benefits (tailored information, instantaneous access), but also presents a number of disadvantages (technical language, unequal access), obstacles (information overload, disorganization), and dangers (inaccurate and risk-promoting information, lack of peer review).

Given these challenges, the general public continues to turn to mass media to help synthesize health information (Bomlitz & Brezis, 2008), and sustained trends show media consumers increasingly look online for news (Pew Research Center, 2010). Based on the principles of agenda setting (McCombs & Shaw, 1972), what is presented in the media influences what media users consider important with respect to health and disease. Indeed, what is covered by mass media plays a major role in the way individuals receive information, the importance they ascribe to issues, and the perceived personal risk or susceptibility to each issue (Berry, Wharf-Higgins, & Naylor, 2007).

A contemporary example of the effect of media on perceptions of health issues is the heightened interest in infectious disease in American popular culture. Indeed, a noticeable increase of content related to viral and bacterial diseases in news coverage, advertisements, and entertainment media has occurred over the past two decades (Tomes, 2000). Consequently, this perception is associated with an increased sense of vulnerability to microbial threats, bringing with it increased vigilance, perception of vulnerability, and interest in mechanisms of transmission and prevention strategies (Berry et al., 2007). This study aims to examine these possible relationships between the frequency of media coverage of high-risk health issues, the public's perception of risk, and the actual risk of mortality posed by the injuries and diseases.

Background

Agenda Setting and Health Information

In today's technologically-connected world, health knowledge is often gained through the media rather than through personal experience. About 65% of the world's first news about infectious disease now comes from informal sources, including press reports and the Internet (Heymann & Rodier, 2001). Only a small portion of all disease is experienced

firsthand by individuals or even communities. Epidemics that occur at a national or international scope are generally experienced through the eyes of a journalist.

According to agenda setting theory, media does not tell people what to think, but what to think about (Cohen, 1963; McCombs & Shaw, 1972, 1993). General consensus among media scholars is that media portrayals affect individuals' views of issues and the world, and the pervasiveness of such media have led to living our lives as *mediated* (Altheide, 2002; Clarke & Everest, 2006). This concept is often used to describe how "media emphasis on political issues influences which issue is perceived as relatively important" (Dearing & Rogers, 1996, p. 8). The news and other media give the public context and language to describe various problems and issues from their lives (Altheide, 1997).

Previous research has indicated that the public's perception of disease is impacted by high levels of media reporting (Young, Norman, & Humphreys, 2008). Indeed, according to the priming hypothesis, individuals make decisions based not on a comprehensive analysis of a full range of information but rather on a smaller subset of information that is readily available, often due to extensive news coverage relating to the topic at hand (Miller & Krosnick, 1996). The basis for priming is that people find it easier to retrieve information recently stored or accessed frequently (Graber, 2001). Additionally, issues and stances presented in the media also gain greater legitimacy among the public. Indeed, a significant portion of individuals rely on mass media as their only source of knowledge about illness, treatment and prognosis of disease "as much as, or even more than health care providers" (Clarke & Everest, 2006, p. 2592). Consequently, diseases frequently portrayed in media gain higher status and can even lead to panic.

How the content is framed is as equally important as the content of the message. Frames refer to the assignment of importance to particular information or point of view in any particular story (Clarke & Everest, 2006). Both the media and the public have the tendency to ascribe metaphors to a disease (Sontag, 1988), framing the meaning of a disease for the public with little scientific basis. In the absence of scientific arguments, the frequency of coverage also serves to increase the salience of an issue and framing it as more important in the eyes of the audience (McCombs, 2004).

News Media and Coverage of Health Issues

The frequency of coverage by mass media creates a context for audiences to assess risk. Overstatement of risk can lead to panic (Nerlich, 2008), while understatement of risk may lead to apathy and a sense invulnerability. Appropriate risk communication deals with providing knowledge about risk issues, influencing risk-related behavior, and facilitating cooperative conflict resolution (Rohrmann, 1992). This is one of the key roles of media in public health.

Some research has been conducted to examine the relationship between the intensity of media coverage and the actual risk of an event to public health (Bomlitz & Brezis, 2008). In some cases, the amount of media coverage was inversely correlated with actual numbers of deaths for the specific risks. In 2003, for example, SARS and bioterrorism generated over 100,000 media reports, though they were only linked with a small amount of fatalities (Bomlitz & Brezis, 2008). Similar parallels can be drawn to methcillin-resistant Staphylococcus aureus (MRSA) (Tomes, 2000), "mad cow disease" (Washer, 2006), and Ebola (Farmer, 1996; Ungar, 1998). Conversely, far less time, money and media are spent on common health threats, such as smoking and obesity.

Hypotheses and Research Question

The coverage on risk, agenda setting and media coverage suggests that public perception of risk is based on the frequency of media coverage on an issue, but that media coverage does not necessarily correspond to the mortality or global burden of diseases and injuries. These findings lead to Hypotheses 1-3.

H1: Frequency of media coverage correlates with the public's perception of personal and societal risk of specific diseases/injuries.

H2: Frequency of media coverage is not correlated with actual mortality by diseases/injuries.

H3: The public's perception of personal and societal risk of specific diseases does not correlate with actual mortality by diseases/injuries.

Research into the promotion of risk-reducing behavior has found that individuals process health and behavior-change information on a societal as well as personal level (Tyler & Cook, 1984). A perceived threat to society may thus not be considered at a personal level. This leads to research question 1.

RQ1: Is there a difference in perceived threat to society and perceived risk to self?

METHODOLOGY

Reported Mortality

Eleven causes of death were included in this study. Nine were chosen to represent the primary causes of death around the world, and include both chronic (cancer, heart disease,

diabetes) and infectious diseases (HIV/Aids, tuberculosis, meningitis, Hepatitis C), as well as intentional injuries and unintentional injuries. Additionally, anthrax and H1N1 virus (swine flu) were included because they have relatively low mortality but have received significant media coverage in recent years.

Mortality data was taken from the World Health Organization Mortality Estimates (World Health Organization, 2008), with estimates reflecting data from 2004. As two of the selected causes of death, H1N1 virus and anthrax, were not included in the WHO mortality report, estimates were sourced from additional WHO sources and nationmaster.com, a website that compiles a wide range of statistical data with international scope. Worldwide estimates were utilized instead of U.S. or regional mortality data for two reasons: First, in a globalized media environment, the public has access to health news from around the world, and the media outlets selected are international in nature. Second, the mortality from of the selected causes varies dramatically from region to region, and local or regional estimates report extremely low mortality.

Media Coverage

The researchers conducted a search of three major news web sites: CNN.com, MSNBC.com, and WashingtonPost.com using the Lexis-Nexis database. These sources were selected because they are among the most-visited online news sources (Alexa, 2010), are powerful news organizations that disseminate news across multiple media, and were available on Lexis-Nexis.

Full-article keyword searches, rather than headline counts or subjective story coding, were utilized to minimize coding bias; this approach further allows investigation into whether the mere mention of disease precipitates fear. Search terms included common word variations of the selected diseases and required the inclusion of either “death,” “deaths,” “died,” “fatality,” or “fatalities.” Results tabulated articles from June 1, 2009 to June 1, 2010. While there are many potential yardsticks for measuring frequency of coverage, criteria were chosen that would be widely acknowledged as significant, conducive to statistical analysis, and relatively immune to subjective interpretation.

Perceived Risk

To measure the public’s perceived risk, an online survey was administered utilizing a network referral sampling method. An initial purposive sample was selected based on demographic diversity in an attempt to reach respondents of all age groups, races/ethnicities and occupations. These individuals were then asked to circulate the survey link among their online networks, under the assumption that this would yield responses from demographically similar participants. The 25-item survey was developed to assess perceived risk to self and

risk to society. It was pre-tested to ensure that respondents understood the causes of death, including broad labels like intentional and unintentional injury. Respondents were asked to rate their level of concern over each of these causes of death to threaten them personally as well as their level of concern that the disease poses a threat to society. Level of concern was rated on a 5 point Likert-type scale ranging from "Very Concenred" (5) to "Very Unconcerned" (1), with the midpoint (3) representing "Neither Concerned nor Unconcerned". A total of 225 participants responded to the survey, representing a diverse range of ages and ethnicities.

RESULTS

Reported Mortality

According to figures from the WHO and nationmaster.com, roughly 35 million individuals die from the selected causes each year. The primary causes of death were heart disease, cancer and unintentional injuries, which accounted for 80.1% of the worldwide deaths included in the study. The least-common causes of death, Hepatitis C, H1N1 virus and anthrax accounted for just 0.002% of annual deaths (see Figure 1).

Media Coverage

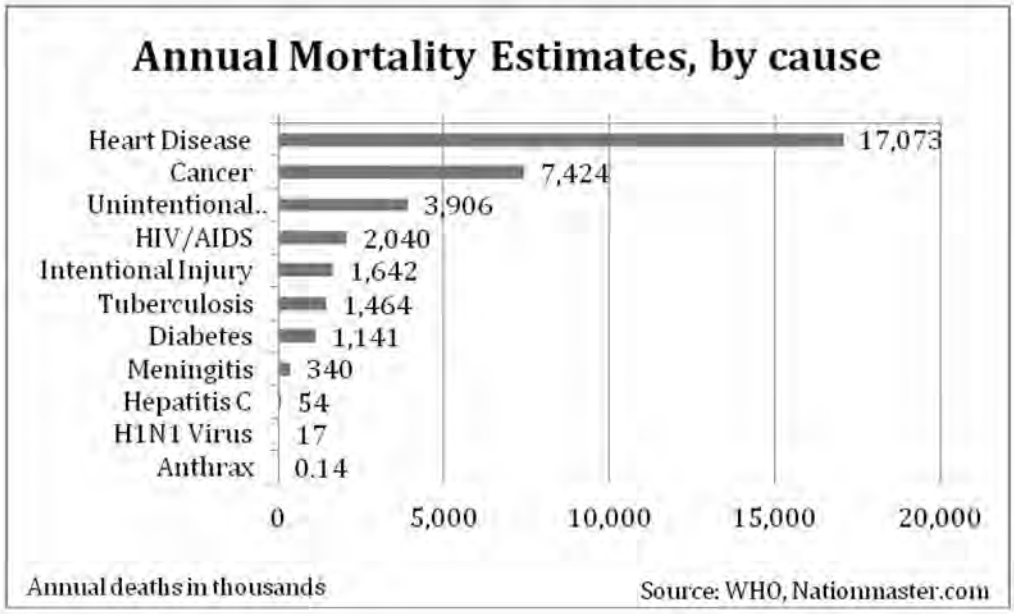
A total of 3,615 articles were found, with CNN.com yielding 79.4% of the story sample. Intentional injuries, HIV/AIDS, and cancer accounted for 74.3% of articles, while the three least common causes, meningitis, anthrax and hepatitis C were responsible for just 0.001% of articles (see Table 1).

Perceived Risk

The 225-person survey sample represented a range of age groups from 18 to over 65 years of age. Over half of respondents (56.9%) were between the ages of 26 to 46, while 24% were aged 46 to 65, and 15.1% were 18-25. Only 4% reported being over 65 years of age. Additionally, 41% of respondents identified themselves as White, 27% as Hispanic, 23% as Black or African American, 6% as Other, and 3% as Asian. Respondents' socioeconomic status was generally high, with more almost half of the sample (46%) reporting a combined household income greater than $100,000, and the majority (83.1%) having at least a college degree.

The Internet was cited most frequently by respondents as the primary medium for news consumption (36.9%), and was followed by television (28%), newspaper (6.7%), radio

Figure 1: Worldwide mortality estimates



(4.9%), social media (3.1%), and magazines (0.4%). Twenty percent of respondents did not identify a primary source, or listed multiple sources that were treated by researchers as non-responses. The Internet was the most frequently used medium among survey respondents, with an average of 3.3 (±3.0) hours per day of reported use.

Interestingly, respondents believed the causes of death to be a greater threat to society than the self at statistically-significant levels, in all cases. They perceived cancer, unintentional injuries and heart disease to be the most dangerous threats to the self, while cancer, heart disease and diabetes were the most dangerous threats to society. Anthrax and tuberculosis were perceived to be the least dangerous threats to both the self and society (see Figures 2 and 3).

Ranking Correlations

No cause of death ranked equally among all four sources measured. The greatest fluctuation occurred among intentional injuries, H1N1 virus and HIV/AIDS, while the least fluctuation occurred among meningitis, anthrax and cancer. Additionally, Spearman correlation measures of the rankings showed that coverage by the three mainstream media outlets studied correlated at a statistically-significant level with worldwide mortality (0.727; p=0.011), risk to self (0.633; p=0.036), and risk to society (0.735; p=0.010). The perception

Table 1: Number of articles in leading online media outlets

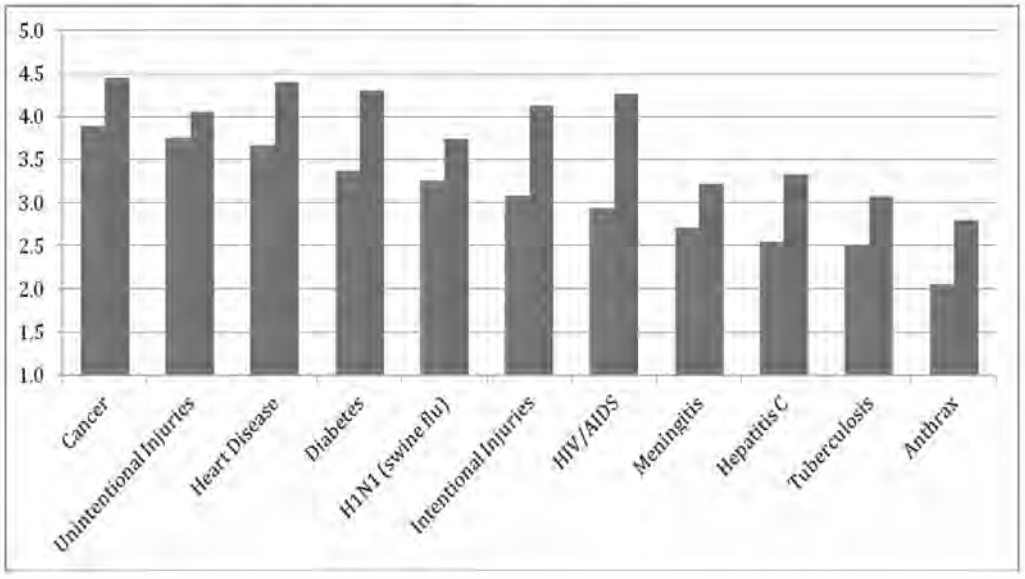
Injury Type	CNN	MSNBC	WaPo.com	COMBINED
Intentional Injury	1359	62	131	1552
HIV/AIDS	448	35	85	568
Cancer	396	59	111	566
Heart Disease	236	37	39	312
Unintentional Injury	169	30	54	253
H1N1 Virus	120	21	26	167
Diabetes	99	11	26	136
Tuberculosis	19	4	4	27
Meningitis	14	1	3	18
Anthrax	4	2	4	10
Hepatitis C	6	0	0	6

of risk to self also correlated with perception of risk to society (0.847; p=0.001) and worldwide mortality (0.715; p=0.013). Lastly, the perception of risk to society also correlated with worldwide mortality (0.781; p=0.005) (see Table 2).

DISCUSSION

Two of the study's hypotheses were not supported by the data, while one was. The first hypothesis posited that the frequency of media coverage would correlate with the public's perceived personal risk of specific diseases/injuries. This assertion was supported,

Figure 2: Perceived Threat to Self & Society

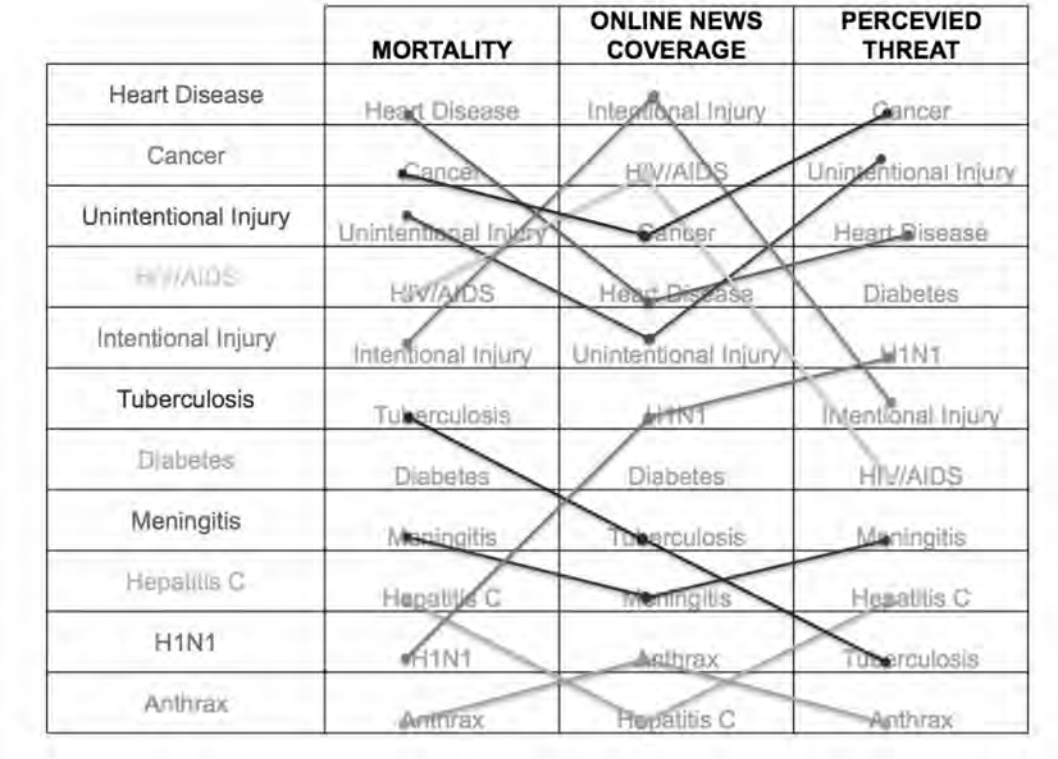


echoing previous findings (Young et al., 2008). It may thus be inferred that the mainstream media continue to set the agenda, at least in the context of affecting health risk perceptions. While the Internet has become a primary source of health information – a trend consistent with reported preferences by the present study's sample – and offers a seemingly endless amount of sources, individuals may still be relying on the mainstream media to help them synthesize what may be perceived as complex information and assess the potential of health threats.

The second hypothesis posited that the frequency of media coverage would not be correlated with the actual mortality of diseases/injuries. This assertion was not supported, as a rank correlation was found to exist at a statistically significant level. This suggests that the frequency of mainstream coverage of health issues, in the context of risk and mortality among common threats, is symmetrical to the actual threat. It should be noted that nine of the eleven threats were conventional risks; of the two risks expected to have received great media attention (anthrax and H1N1 virus), only H1N1 virus yielded substantial media results for the time period specified, and was found to have the greatest discrepancy between coverage, mortality, and perception of risk to self.

This finding contradicts earlier studies that found that in some cases, the amount of media coverage was actually inversely correlated with actual number of deaths (Bomlitz & Brezis, 2008). This disagreement may be partly explained by the sources selected and keywords utilized, as well as the article-count approach utilized by researchers.

Figure 3: Cause of Death Rankings by Source



The third hypothesis posited that the public's perceived personal risk of specific diseases would not correlate with actual mortality by diseases/injuries. This assertion was not supported, as a rank correlation was found to exist at a statistically significant level. This finding suggests that individuals are able to competently assess the risk of health threats, or perhaps are sufficiently influenced by what was found to be symmetrical media coverage.

The researchers also sought to investigate the existence of a difference in perceived threat to society and a perceived risk to self. Across all threats measured, respondents measured the risk to society to be at a greater level than the risk to the self, at statistically significant levels. Thus, while individuals recognize that these issues are a problem in society, they do not feel personally vulnerable. This finding highlights the need for health communicators to appeal directly to the individual, rather than relying on the mere specter of a threat to others.

Table 2: Spearman Rank Correlations

Source	Media	Risk to Self	Risk to Society	Mortality
Media		.633* (p=0.036)	.735** (p=0.010)	.727* (p=0.011)
Risk to Self	.633* (p=0.036)		.847** (p=0.001)	.715* (p=0.013)
Risk to Society	.735** (p=0.010)	0.847** (p=0.001)		0.781** (p=0.005)
Mortality	.727* (p=0.011)	.715* (p=0.013)	0.781** (p=0.005)	

Study limitations

Due to the nature of the convenience sample, the level of education and average income exceeded that of the general population, which may over-represent the use of new media and media literacy. It is recommended that future studies look at a broader range of education levels and range of media use. A larger respondent sample may also allow researchers to explore relationships between socio-demographical data and perceived health threats. The keyword selection, while taking into account popular terminology, may also have not accounted for all possibilities among individual disease and injury types. Additionally, the article-count approach may not reflect the true nature of media coverage and the manner in which issues are framed. Finally, mortality data was not concurrent with media coverage range data. Ideally, these should be from the same year.

Recommendations for future research

The findings in this study not only add perspective to the changing understanding of health news and the public's perception of risk but also raise more questions. The correlation between frequency of news coverage and global mortality contradicts previous findings. Further research is needed to confirm these findings and determine whether online media have become more responsible or accurate in covering health threats, or whether previous studies focused on specific diseases that received dramatic media coverage but had low mortality (such as SARS and MRSA). Another possible explanation for the findings is that with cross-media agenda setting, health information does not only go from the media to the consumer, but also from the consumer to media through user-generated content. It would be important to conduct consumer behavior studies and understand how Internet users

consume health news, and whether they corroborate health news with other online sources of health information. Since this study included a sample with higher than average education, it would also be useful to compare these behaviors between Internet users of different education levels.

Of particular interest in this study were the categories of intentional injuries and HIV/AIDS: respondents rated these two risks on average as posing a serious threat to society, but a minor threat to themselves. This discrepancy in perceptions should receive further research to determine the existence of a phenomenon as well as the attitudes and reasons that underlie it. Future research could also assess how different media are used to corroborate information, and how credibility of Internet sources and overlap of media use may impact the public's consumption of health information. Lastly, to facilitate more global understanding of this topic and given media trends, it may also be conducive to study the area of new or social media, and whether its content reinforces or contradicts mainstream media. While open access to create content on the Internet can be a tremendous help in the speed of health news transmission, it can also be a source of inaccurate information since anyone can spread inaccurate information.

CONCLUSION

While new and social media have introduced a vast number of inexpensive and accessible resources for health information consumers and despite an increasingly pronounced shift toward both online and offline sources, individuals' perceptions of health threats continue to mirror that of mainstream media. This may not be detrimental, however, as the media's coverage, measured by frequency, may be symmetrical to the actual mortality rates of health risks, thus leading individuals' perceptions to be in line with actual mortality. Interestingly, individuals believe the threat to the self across the most lethal chronic and infectious diseases to be inferior to that of society at large, especially in the context of HIV/AIDS and intentional injuries. These findings illustrate a potential for significant changes in the fields of health news and risk communication, and thus deserve further study.

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COUPLE TESTING FOR HIV: EVALUATING EFFECTIVENESS OF A VIDEO IN UGANDA

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This paper is set within the context of recent thinking in communication for social change that proposes the use of hybrid approaches, which combine information dissemination with participatory methods with a view to effect both cognitive and dialogic change. The paper presents the results of a pre-post evaluation of a roughly 10-minute educational video encouraging couple testing for HIV to deal with issues of status disclosure particularly in a discordant couple. The intervention was planned and executed in Kampala, Uganda, based on participatory design, and went through several iterations before finalization. The evaluation was conducted in a slum in Kampala. It found that the video was effective in changing beliefs about discordancy, disclosure, importance of couple testing, benefits of couple testing and what happens in couple counseling and testing. The project is significant because few interventions, particularly those that have been subjected to evaluation, are available for discordant couples even though marriage is considered a major risk for HIV transmission in some African countries including Uganda. The video will be made available in Uganda for use in mass mediated programs and in community settings for HIV education with the viewing to be followed by discussion and dialogue. The paper is significant because it demonstrates the usefulness of an intervention that combines indigenous input with the work of an outside catalyst and that uses information dissemination with the intent to create dialogue for change.

Keywords: communication intervention, evaluation, couple testing, couple counseling, HIV discordancy, HIV education video

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UNESCO (2007) has emphasized education as a critical ingredient of its strategy to deal with HIV/AIDS, and Devanter, Thacker and Arnold (1999) recommend educational efforts for discordant couples. This paper presents the results of a pre-post experiment conducted in Kampala, Uganda, to test the effectiveness of an educational video to encourage couple testing for HIV. Effectiveness was measured mainly in terms of change in beliefs about the benefits of couple testing as well as intent to get couple tested for HIV. Thus the project expected change at the individual level in line with social marketing and behavior change models. At the same time, the project added a participatory element by eliciting input in problem definition and using completely local video content. It used a hybrid model increasingly used in the communication for development field today, one that combines indigenous knowledge and input with the initiative of an outside catalyst and an information dissemination approach (Waisbord, 2001).

Couple-focused HIV prevention interventions are still new (Burton, Darbes, & Operario, 2010), and couple-focused HIV interventions that use communication (such as public service messages) are few in number. There is a particular dearth of communication interventions that deal with couple testing. Naturally then, intervention evaluations have focused on knowledge of HIV transmission or use of condoms, reduction of high risk behavior or self efficacy in condom negotiation, and such. This may be the first study on couple testing beliefs. While this project was not an entire campaign, it adds to couple testing interventions, and the evaluative study of the intervention adds to the literature on the effectiveness of messages.

HIV Prevention and Testing

The video is an HIV prevention intervention. While both the focus and funding for HIV related issues are increasingly being torn among many demands, UNAIDS has cautioned that any temptation to deprioritize HIV prevention as the epidemic evolves should be resisted, and that interventions should target those populations and risk behaviors that are driving the epidemic at the local level. This caution is particularly important in face of the fact that HIV is a 'hidden' problem unlike famines and disasters, which are highly visible and for which mobilization of effort is therefore easier (UNAIDS, 2008). Also, prevention continues to be critical in addressing HIV in view of the number of new infections each year. In 2008, 2.7 million new HIV infections occurred of which 2.3 million were in adults (UNAIDS, 2008). According to a *New York Times* article, UNAIDS has said that for every 100 people put on treatment, 250 people are newly infected (McNeil, 2010).

Knowledge of one's status is important in preventing new infections. However, 'Despite…reported increases in the availability and uptake of HIV testing and counselling,

knowledge of HIV status remains inadequate. Seven population-based surveys conducted in 2007 and 2008 indicate that the median percentage of people living with HIV who knew their HIV status prior to the survey remains below 40%' (WHO, UNAIDS, UNICEF, 2009, p.13). The median for 15-49 year olds who know their status through HIV testing in select low- and middle-income sub-Saharan African countries is 22% (http://www.who.int/hiv/topics/vct/data/en/index.html).

In Uganda, the latest data (available for 2006) indicates that 10% of men and 12% of women between the ages of 15 and 49 get tested (UNAIDS, 2008). Reasons for lack of uptake of HIV testing include 'low awareness of personal risk of HIV infection and fear of stigma and discrimination' (http://www.who.int/hiv/pub/2009progressreport/en/index.html). Steinberg (2008) describes the 'architecture of shame' that people feel when they go for HIV testing, 'the pairs of eyes that note who goes into the makeshift testing center and how long their post-test counseling lasts; the whispering and the silent scorn' (p. 88).

Discordancy, Disclosure and Couple Testing

HIV prevalence in Uganda is around 5.4% (UNAIDS, 2007), but prevalence is rising partly possibly due to the rise in sexual risk taking. The latest data (available for 2006) indicates that six percent of 15-24 year olds and 12% of 25-49 year olds have had more than one sex partner in the past 12 months (UNAIDS, 2008). Also, the proportion of adult men and women who had sexual contact outside of a marriage or live-in partner has grown from 12% to 16% for women and 29% to 36% for men since 1995 (Kirungi et al., 2006; Ministry of Health [Uganda], ORC Macro, 2006; Uganda Bureau of Statistics & Macro International Inc, 2007).

Heterosexual transmission of HIV, outside of and within long-standing relationships including marriage, has become a very common method of infection in Africa (Freeman, et al., 2004; Maharaj Cleland, 2005; Malamba, et al., 2005; Mubangizi, et al., 2000). According to the Uganda AIDS Commission (2007), 42% of HIV transmissions occur during sex within a marriage and married people make up 65% of new HIV infections. Allen, et al., (2003) found in their study that 87% of new infections were from the spouse.

Often, couples establish and participate in long term relationships, including marriage, without knowing either their or their partner's status. Also, the possibility of a partner bringing HIV later into the couple's relationship is present. Couples can remain in a discordant relationship, where one partner is HIV positive and the other HIV negative, for a period of time, but transmission can occur at any time. According to UNAIDS (2008), when low knowledge of HIV status combines with infrequent condom use, transmission risk within discordant couples can be high. More specifically, according to Wawer, et al. (2005),

in a discordant heterosexual relationship, the negative partner has an 8% annual chance of getting infected.

Demographic and Health Surveys in five African countries revealed that two-thirds of HIV infected couples were discordant (de Walque, 2007). In East Africa, more than 40% of HIV positive married individuals had uninfected spouses; in 30% to 40% of the cases, the infected partner was female (Were, et al., 2006). Mubangizi, et al. (2000) found that 18% of married couples visiting the AIDS Information Centre in Kampala, Uganda, were discordant.

Testing alone is insufficient to address discordancy. Testing must be accompanied by disclosure of one's status to one's partner. But disclosure in discordant couples is low (Kairania, et al., 2010), and in relationships of marriage, long-term cohabitation, or somewhat permanent sexual partnerships disclosure may have serious consequences such as domestic violence and loss of financial support (Van der Straten, et al., 1998; Collini & Obasi, 2006; Greeff, et al., 2008). Couple testing is offered as the solution to this problem (Were, et al., 2006; Malamba, et al., 2005) because in couple testing, when a counselor discloses results, s/he does so after preparing the couple. The counselor can also immediately channel the couple into appropriate services and support systems so as to avoid 'relationship disruptions' if the couple is found to be discordant (Carpenter, et al., 1999; Collini & Obasi, 2006; Van der Straten, et al., 1998, p.71).

The counselor also helps couples to deal with discordancy related myths and misconceptions (Bunnell, et al., 2005; Lingappa, et al., 2008) and meet the challenges of a discordant couple such as couple relationship (emotional and sexual), confronting reproductive decisions, and planning for the surviving family and for child care, all of which can result in greater couple communication and reduction in HIV risk behavior (Tangmunkongvorakul, et al., 1999; Van der Straten, et al., 1998). One study used a facilitated couple counseling approach to enhance disclosure among discordant couples (Kairania, et al., 2010). Essentially, the intervention included sensitization to the benefits of disclosure and couple counseling, partner communication strategies, and facilitation by and provision of ongoing support by a counselor. The intervention resulted in high disclosure. After disclosure, the counselor helped the couple to understand the implications of discordancy and advised the couple on strategies for the future. Thus disclosure is beneficial (Collini & Obasi, 2006; Greeff, et al., 2008; Were, et al., 2006).

However, because often a partner assumes that her/his status is the same as the partner's, engaging in testing by proxy (Morrill & Noland, 2006), 'only 10-30% of persons in Africa … come [to test] as a couple…' (Lingappa, et al., 2008, p. 3 of 9). According to Malamba, et al. (2005), 70% of the clients who go to voluntary counseling and testing centers come alone and most do not know their or their partner's status.

Thus encouraging couples to come together to test for HIV is a critical step in containing HIV spread in long-standing relationships. According to WHO, UNAIDS,

UNICEF (2009), 'HIV testing and counselling is … the gateway to HIV prevention, treatment and care' (p. 14). In view of UNAIDS' (2008) suggestion that sexual partnerships, including serodiscordant relationships and multiple concurrent partners, be strategically targeted for prevention, couple testing and counseling may be considered the gateway to prevention, treatment and care for these groups. Finding a voluntary counseling and testing intervention successful, Coates, et al. (2000) suggest that the opportunity for a couple to come together to discuss the results of an HIV test in a safe setting and to negotiate a risk reduction plan is a strategy that needs widespread adoption to reduce the high rate of transmission among discordant couples.

The Educational Video

In keeping with the tenets of communication for social change theory that specify the critical need to have indigenous participation in defining problems and solutions (Beltran, 1976; Diaz-Bordenave, 1976; Diaz-Bordenave, 1989), the researcher conducted a focus group discussion and in-depth interviews to elicit (from members of a community and the staffers of an NGO that served the community) HIV related issues that could be addressed using communication. In-depth interviews and the focus group technique were selected because they are particularly well-suited to exploration—they allow for probes on part of the interviewer and for unanticipated revelations on the part of the interviewee, enabling the emergence of ideas that the researcher may not have foreseen. Because of the near absence of disclosure of HIV status and the implications of this for couples that are discordant, the idea of developing a message to encourage couples to test together for HIV began to emerge. Couple testing would ensure that disclosure took place because the counselor reveals results to the couple jointly.

According to the then director of the NGO, 'disclosure is crucial for prevention in the long run. I think it's easier to accept a result if you get it at the same time;' thus, she said, the first message is to test together: 'Test together and continue living together, be supportive of each other' (M. Juncker, personal interview, May 30, 2006). Many benefits of couple testing finally used in the video emerged from this research as well as from a literature review on couple discordancy.

The video is roughly ten minutes long. It was filmed in Kampala, Uganda. It begins with a counselor narrating the story of a woman who tests HIV positive as a lead into explaining HIV and the hope offered by treatment. This is followed by a short voiceover about the Ugandan experience with HIV. Next, a Ugandan man who is in a discordant relationship talks about his status, from which the video segues into a definition of discordancy and the play of chance in HIV transmission to the negative partner. The voiceover returns to suggest that to deal with discordancy, disclosure is necessary; for

disclosure to occur, testing is necessary; and for testing to happen, it has to be done sensitively particularly for couples. The voiceover says that couple testing is the sensitive solution but that most persons come alone because they are 'testing by proxy.' The video then encourages couples to test together.

Next, on-screen text presents the benefits of couple testing, reinforced by a voice over. One of the female interviewees then elaborates on how domestic violence can happen if a person goes alone for testing, finds s/he is positive but does not disclose this to the partner, who then may hear about it from elsewhere and react violently (even though the partner might be positive too and not know it). Recognizing the dominant position that males hold in Ugandan society, and the larger number of women who come to test, two other male interviewees encourage men to participate in couple testing. This is followed by one woman suggesting that when couples go to test together, the counselor presents options for a couple, so it is best to get that 'knowledge when you are two compared to when you are single, single.' This leads to on-screen text and voice over, interspersed with supporting video, on what happens in a counseling situation including when the results reveal discordancy (i.e., the counselor gives options for seeking help to keep the negative partner negative and to be supportive of each other).

The voiceover, backed by supporting video, then lists more benefits of couple testing such as couple testing allows positive people to take their medicine regularly because they do not have to hide it from their spouse, it allows a positive mother to seek medical help during pregnancy and birth and not to be forced to breast feed her baby thus reducing the chances of mother-to-child transmission, and it allows the couple to plan for the future. The video ends on a positive note, evoking African collectivism with content about the family being a 'strong component' in African culture and the need to preserve the family and the community, and suggesting that couples need to be encouraged to test together 'for the betterment of our society.'

The voice in the voiceover belongs to an East African female. The background color for the text is a brown-yellow and the text uses a thick, white, shadowed font for legibility. The text appears on the screen point-by-point as the narrator voices it. The language is English. Uganda was a British colony and English is commonly used in Uganda. The on-screen text is presented below (words in parentheses represent major additional voice-over).

Couple Testing Benefits

1) Makes disclosure easier.
2) Reduces the fear of disclosure.
3) Helps you to support your positive partner.
4) Allows your partner to accept your positive status.
5) Increases the chances of keeping a negative partner negative.

6) Reduces domestic violence.

Visit for Couple Testing
The counselor

1) Explains discordance.
(2) Asks what each of you will do if you are in a discordant relationship
(3) Counsels you to be supportive of each other.

If the results indicate discordancy, the counselor gives you the options you have…

For seeking help to keep the negative partner negative
To be supportive of each other

Other Benefits of Couple Testing

1) Allows you to take your medicine regularly (because you do not have to hide your medicines from your partner).
2) Helps to reduce mother-to-child transmission of HIV (because you can seek medical help during pregnancy and birth, and not be forced to breast-feed your baby for the sake of appearance. All of these help to keep HIV from being transmitted to your baby).
3) Allows you to plan for the future of your family and particularly for your children.

Video was selected as the medium because of illiteracy in the slums and because of video's ability to tell powerful stories using voices and faces of people the target audiences can identify with. Videos can also be more effectively used for group counseling, and can be followed by Q&A as well as discussion to clarify misconceptions. More important, they can lead to dialogue in the community, immediately following the viewing as well as later.

Evaluation of Communication and Other Interventions

Considerable research has been done on the effectiveness of mediated communication for social change including in the health/HIV field. Meta-studies have found increased condom use and testing, increased discussion with partners and friends, and increased testing for those who discussed more (Kincaid, n.d.), increased immediate effects on testing but not long-term effects (Vidanapathirana, et al., 2005), small effects for increased HIV knowledge and reduced high risk behavior (Bertrand, et al., 2006), and small measurable

effects of health campaigns (Snyder, et al., 2004). Meta-studies for condom use interventions (Foss, 2007) and, of particular interest to this study, couple focused behavioral interventions (Burton, Darbes, & Operario, 2010) (neither specified if any were mediated communication interventions) found respectively increased condom use for sex workers but not for other sexual relationships and consistently reduced unprotected sexual intercourse and increased condom use compared with control groups.

Other studies include McCombie, Hornik and Anarfi (2002) who found increased HIV knowledge and condom use as the result of a campaign, Vaughan, et al. (2000) who found reduced partners and increased condom use as well as increased interpersonal communication about HIV /AIDS from exposure to an enter-education program, Kuhlmann, et al. (2008) who found increased testing from viewing a radio serial, Mundy and Wyman (2006) who found increased knowledge that testing is the only way to know HIV status from PSA exposure, and Jansen and Janssen (2010) who found that greater comprehension of cryptic billboards led to increased dialogue.

Home visits by trained Islamic leaders in Uganda were effective in increasing condom use, reducing partners, and transmitting HIV knowledge (Islamic Medical Association of Uganda, 1998). One study (Kelly, et al., 1991) found that a community field intervention that used interpersonal endorsement of changing HIV risk behavior among gay men in the United States was successful in increasing condom use and decreasing number of partners. Coates, et al. (2000) found that a voluntary counseling and testing center intervention increased condom use.

An intervention that encouraged couples to present together at antenatal clinics and to undergo couple counseling resulted in greater uptake of preventive measures among couples who participated and particularly among couples who were counseled (Farquhar, et al., 2004). Particularly, condom use increased in the cases in which the positive woman notified her partner of her status. The study found that women whose partners came to the clinic for counseling were more likely to avoid breastfeeding their baby and increase their use of nevirapine. The authors suggest that partner participation leads to dialogue, which then leads to preventive measures uptake, in contrast to when a woman simply notifies her partner of her positive status because in the latter case no additional information about prevention is exchanged between partners. When couples are counseled together, information is provided by the counselor to both partners. In fact, the authors found a stepwise increase ‘in intervention uptake from partner notification of a positive test result, to partner participation in individual counseling, and finally to couple counseling’ (Farquhar, et al., 2004, p. 1625). The authors encourage campaigns promoting couple counseling.

A few studies have evaluated interventions specifically targeted at discordant couples. Allen, et al. (2003) evaluated the effect of a VCT promotion with such couples and found increased condom use, and Roth, et al. (2001) found that when counseling was offered to

men in such couples it led to increased condom use and less coercive sex as reported by women. An evaluation of a "small groups" intervention for discordant couples (McGrath, et al., 2007), which taught communication/negotiation skills about sex, found improved reported comfort in discussing sex and condoms with the partner and increased condom use.

At the same time, some interventions are only modestly successful (Snyder, et al., 2004) and some create effects indirectly. One study examined the influence of cues to action (public service announcements, community event, etc.) about bicycle safety helmets, which according to the Health Belief Model can indirectly influence attitudes, intentions and behavior through perceived threat, and found that they were not significantly related to these dependent variables but were related to threat perceptions (Witte, et al., 1993). Rimal and Creel (2008) found that exposure to the *Radio Diaries* program in Malawi did not have an effect on stigma. However, they found a significant interaction between exposure and efficacy (to reduce number of partners) indicating only a small difference in stigma by exposure level for those with low efficacy, but a significant difference by exposure level for those with high efficacy. Opposition to condom promotion has been found by some studies (Islamic Medical Association of Uganda, 1998; Mitchell, et al., 2002).

Mitchell, et al., 2002 qualitatively evaluated community perceptions of an intervention that included communication materials and provision of training and services and found that to some extent components of the intervention valued by the implementers were different from those valued by the subjects. For example, subjects expected material benefits. At the same time, subjects did note the benefits of the interventions.

Informed by the framework of the evaluation studies of both mediated and other interventions, the main research question of this study is: How effective was the video in changing beliefs about

a) The disease, disclosure and discordancy, importance of couple testing, confidence in convincing partner/friend to couple test, and intent to test together as a couple,
b) Couple counseling, and
c) Benefits of couple testing?

METHOD

After earning the requisite permissions, and with the help of a U.S. university linked organization and an NGO serving the community, the study was conducted in a slum in Kampala, Uganda, in an open shed with two small rooms at one end. Subjects were recruited with the help of community mobilizers. Both mobilizers and subjects were given a transport allowance. Screening criteria were: must be over 18 years old, must not have worked in a health/HIV related field (the criterion did not include home based care and social work),

must be a member of a couple or in a relatively long standing sexual partnership, and must not have tested together as a couple (this criteria was relaxed by one project advisor so that couples who were tested during a wife's pregnancy but had not received counseling were included; but only one such couple finally participated in the study). Within the African context, the relationships include legal and traditional African marriages as well as non-married amorous and sexual relationships. Mahlasela, Kincaid and Chikwava (2010) indicate the different types of relationships — 'main partner,' married, living together, etc.— present in South Africa; main partner relationships — most frequent in the younger age groups — were the largest (44% of the respondents), followed by married (25%) and living together (10%).

A quasi-experimental design using pre- and immediate post measures was used. A repeated measures design such as this provides greater power than a between-subjects design. A control group was not used in this study because the open shed would have made it very difficult to keep the two groups separate. Research assistants individually administered the questionnaire to each subject in one room. When the nine research assistants had roughly completed one round of pretest administration, the subjects were taken to the adjoining room and shown the video on a television screen. They were then lead to the open area of the shed and asked not to discuss the video with anyone. Once the research assistants completed administration of the pretest to all subjects, they began to administer the post-test to those who had already watched the video. All the data was collected within a few hours on one morning.

Ideally, all subjects in an experiment should receive the treatment (in this case, view the video) at the same time. However, by its very nature, a slum does not have facilities to make this happen. In fact, even electricity to run the television set had to be drawn to the shed. At the same time, the subjects viewed the video in a more realistic viewing situation, their own community, lending greater validity to any effects that may be found. Also, this was a repeated measures design where differences within a person were examined rather than between two groups of people where ideally treatment and placebo must be administered at the same time.

Before the experiment was conducted, the questionnaire was tested with 12 volunteers. The feedback and experience was used to improve the questionnaire, particularly with regard to use of English as spoken in Uganda. The questionnaire collected demographic information first. It then asked subjects whether they had been counseled and tested for HIV but specifically told them not to reveal their test results. Next, three sets of statements represented the three parts of the research question.

The first set included ten statements followed by a five-point Likert scale measuring agreement, likelihood and confidence levels. The items were about subjects' HIV risk perception (Witte, 1992), their beliefs about discordancy and testing by proxy, perceived importance of disclosure and couple testing, likelihood of trying to convince partner to go

for couple testing and actually going for couple testing in the near future, and confidence about convincing partner and convincing a friend to go with his/her spouse for HIV couple testing. These statements were either directly or indirectly related to the script/video. It was expected that the means for these statements would change in the direction of better understanding of the disease, of discordancy, and of disclosure, and a greater intent to test as a couple as well as greater confidence/likelihood of persuading partner/friend.

If subjects indicated lack of likelihood or confidence in persuading partner/going to test as a couple, another set of contingency statements respectively listed reasons for this absence of likelihood/confidence and subjects were to indicate their agreement/disagreement.

The next (second) set of seven statements presented what a counselor does before and after the HIV test, such as explaining discordancy, asking partners what they will do if discordancy is found and reminding them before revealing test results of what they had said, counseling partners to be supportive of each other, disclosing results, and providing options if discordancy is revealed. These items, followed by a five-point Likert scale of agreement levels, matched the script of the video. It was expected that after viewing the video subjects' beliefs about the counseling setting and process would be better aligned with what actually occurs during couple counseling for HIV tests.

The final (third) set of statements (nine) asked subjects to rate the benefits of couple testing using a five-point strongly agree to strongly disagree Likert scale. These items also matched the script of the video. It was expected that subjects' mean responses to these items would change in the direction of greater belief in the benefits of couple testing.

The posttest questionnaire was identical to the pre-test questionnaire. However, answers to questions on demographics, experience with HIV testing and counseling, and discussion of couple testing with friends, etc., were not expected to change because they were unconnected with the video. Some changes were found and, where major, they are reported under findings.

Altogether 48 subjects participated in the experiment. However, five subjects' questionnaires were removed from the final data analysis due to method-related problems. Data were entered into SPSS, cleaned, and analyzed using frequency analysis, descriptive statistics, and paired sample t-tests.

FINDINGS

Demographics, HIV Test, and Discussion of Couple Testing

Mean age of the subjects was 27 years (Table 1). About 56% of the respondents were male, and 77% had a secondary 1 or higher education. Occupations were varied such as bead

Table 1
Pretest Based Distribution of Subjects and Mean Scores

Variable	N	Mean
Gender		
Male	24	55.8
Female	19	44.2
Education (1 missing value)		
Primary 7 or below	10	23.3
Secondary 1 & higher	33	76.7
Have you ever been tested for HIV?		
Yes	38	88.4
No	5	11.6
Mean Age (N=43)		27.47 years
To what extent have you discussed couple testing with your (= mean discussion level):		
Partner?		3.65
Extended Family?		2.70
Friends?		3.42
Community?		2.35

Note: Higher scores equal greater discussion: 1 = Not at All to 5 = A Lot.

maker and small vendors, and the sample included four housewives, eight students, and seven unemployed persons. About 88% of the subjects had been tested for HIV and most of these persons picked up their results and had been counseled before and after their tests. Subjects were asked about the extent to which they had discussed couple testing with others. The results for the pre-test were as follows. Subjects said they had engaged in some discussion of couple testing with their partner (mean = 3.65 on a five-point scale where 5 represented 'a lot' and 1 'not at all') and friends (mean = 3.42), and less discussion with extended family (mean = 2.70) and community (mean = 2.35). They changed their answers in the post-test for community from 2.35 to 2.93 ($t = -2.569$; $p. = .014$). This change could indicate that respondents ignored instructions and discussed the video with fellow community members on-site. One survey has found that communication programs get people

to discuss HIV testing with their partners and such couples are four times more likely to be tested for HIV (HIV/AIDS Communication, n.d.). Thus if the video impels discussion then it could have both direct effects and indirect effects (via discussion) thus impacting overall effects positively. At the same time, if discussion took place on location it raises the question of whether the discussion rather than the video led to the changes that occurred (discussed below). These changes were quite extensive and covered many different points of information though, making discussion a somewhat weak rival explanation/threat to internal validity.

From the three sets of statements expected to demonstrate a change in means, all but one of the means changed significantly (Table 2). Each set of statements is discussed below

Disease, Discordancy, Disclosure, and Couple Testing

The statement that did not register a change was 'You believe that your partner's HIV status is the same as yours' and belonged to the first set of statements. It was expected that agreement with this statement would decrease but in fact it remained unchanged. Either respondents knew this (that their and their partner's status was the same) to be true because they had been tested (88% of the subjects reported having tested for HIV) and had disclosed their status to partners or they still believed in testing by proxy. Whatever the explanation, it is important for future researchers to distinguish in their questions the idea of respondents actually holding a testing by proxy belief from the fact that both partners know each other's status and thus believe that their status is the same as their partners'. Even when couples know each others' status but have not undergone couple testing and counseling, the video can be useful. If both are negative, the video might encourage them to test periodically as a couple. If they are a discordant couple (and to some extent even if both are positive), the video might encourage them to visit a counselor to assist them in dealing with issues that may arise such as wanting children, reducing likelihood of transmission to each other and to a baby, living in harmony, etc. When the video is used in a community setting for HIV education, facilitators will have to pay particular attention to this belief and assess whether the video was responsible for confirming the belief and how. When a second generation of this video is made, these answers will need to be fed back into improving the video to reduce testing by proxy.

For other statements in the first set, the video effected change in perception of the seriousness of the disease and personal risk of infection, knowledge that discordancy can happen, and belief in the importance of disclosure and testing as a couple. It also increased subjects' perception of their likelihood of trying to convince partners to couple test and of couple testing within the next three months, and increased subjects' reported confidence in being able to convince partners to test with them and convince friends to test with her/his partner.

Table 2
Differences in Mean Knowledge, Understanding, and Intent to Act

	Pre-test mean*	Post-test mean*	t-value	p-value
First set of statements				
HIV/AIDS is a serious disease	4.57	4.88	-2.949	.005
You are at high risk for getting HIV/AIDS	3.95	4.54	-2.619	.012
You believe that your partner's HIV status is the same as yours	3.53	3.68	-0.776	.443
It is possible for a person to have HIV and his/her partner to be negative	3.77	4.51	-3.539	.001
It is important to disclose one's HIV status to one's partner	4.26	4.79	-3.059	.004
It is important for a couple to go and test together for HIV status	4.42	4.86	-4.608	.000
How likely is it that you will try to convince your partner to go with you for couple testing?	3.84	4.49	-3.706	.001
How likely is it that you and your spouse will go for an HIV test together in the next three months?	3.58	4.37	-4.102	.000
How confident do feel that you can convince your partner to test for HIV together with you?	4.02	4.56	-3.975	.000
How confident do feel that you can convince a friend to go with his/her spouse to test for HIV?	3.58	4.07	-3.174	.003
Second set of statements				
Before the test, the counselor:				
Explains that one partner can be positive and the other negative	4.40	4.93	-4.394	.000
Asks what each partner will do if you are in a relationship where partners are discordant	3.98	4.86	-5.254	.000
Counsels partners to be supportive of each other	4.33	4.78	-2.887	.006
After the test, the counselor				
Reminds partners of what they had said in the pretest session	4.33	4.79	-4.802	.000
Then discloses the HIV test results	4.46	4.80	-3.002	.005
After the test,				
If one partner is negative and the other positive, the counselor gives options for seeking help to keep the negative partner negative	4.36	4.77	-3.782	.001
The counselor counsels partners to be supportive of each other	4.49	4.90	-3.582	.001

Table 2 Continued
Differences in Mean Knowledge, Understanding, and Intent to Act

Third set of statements				
Couple Testing:				
Makes disclosure easier	4.21	4.88	-3.861	.000
Reduces the fear of disclose	4.18	4.90	-3.697	.001
Helps partners to support each other	4.29	4.76	-2.963	.005
Allows partners to more easily accept the other partner's positive or negative status if their status is different from their partner's	3.75	4.50	-3.553	.001
Increases the chances of keeping the negative partner negative	4.28	4.75	-3.547	.001
Reduces domestic violence	3.00	4.14	-5.187	.000
Allows an HIV+ partner to take medicine regularly because the partner does not have to hide it	4.22	4.78	-4.010	.000
Helps to reduce the chances of an HIV+ mother transmitting HIV to her child	4.39	4.80	-2.533	.015
Allows couples to plan for the future, including for children, if any	4.44	4.85	-2.477	.018

Note: Higher scores equal greater agreement/likelihood/confidence. Scale ranges from 1 = Strongly Disagree/Very Unlikely/Not at all Confident to 5 = Strongly Agree/Very Likely/Very Confident.

Means for disease seriousness, importance of disclosure and testing together, and confidence in convincing partner to test together were already high (above 4) in the pretest, but they still registered a significant increase in the post-test, confirming subjects' beliefs and confidence. The means for the presence of discordancy as a phenomenon (3.77) and likelihood of testing together in the next three months (3.58) were lower in the pretest and went up to 4.51 and 4.37 in the post-test respectively. Thus the video possibly had considerable impact on subjects' belief that discordancy can happen and on their conviction that they would go for a test with their spouse in the next three months.

Diffidence Explained

While the number of subjects who had to answer the contingency questions was small, the results are presented to aid future researchers. In the pretest, five subjects indicated that they were unlikely to try to convince their partners to go for HIV testing, but after viewing the video none of these five said they would be unlikely to make the attempt. While responses varied with some disagreement about reasons, generally the five persons agreed

that not knowing how to bring it up, fear of negative partner reaction and of results, and worry of stigma were reasons and all disagreed that 'it is not useful to a person to know his/her HIV status' was a reason.

Four respondents were diffident in the pretest about convincing their partner to test with them; this number reduced to one in the post-test. Reasons for the diffidence in the pretest and posttest included lack of good communication with partner, partner did not believe you need to test, and partner is afraid of results (though more disagreed that this was a reason). Subjects disagreed that stigma was a reason, and three of the four in the pretest did not know if the partner thought it is not useful to know each other's status.

Finally, ten respondents said in the pretest that they were unlikely to go for couple testing in the next three months; none of the respondents indicated the same in the post-test. Most of the ten subjects agreed that it might take longer than three months to convince the partner, but only some agreed that it might be due to lack of time.

Counseling Process

The significant differences in the means of the second set of statements between the pre- and the post-test indicated that subjects' beliefs about the counseling situation and process, particularly with regard to what the counselor says and does, became more aligned with the reality of the counseling situation.

Benefits of Couple Testing

For the third set of statements, subjects reported an increased understanding that couple testing makes disclosure easier, reduces the fear of disclosure, helps partners to support each other and accept each other's status more easily, and reduces domestic violence, and further that couple testing increases the chance of keeping the negative partner negative, allows a partner to take his/her medicine regularly without having to hide it, reduces the chance of mother-to-child transmission of HIV, and allows couples to plan for the future, including for children.

The change in belief about domestic violence is noteworthy because domestic violence is a major issue and generates much fear of disclosure. The pretest mean was 3.0; it went up to 4.14 in the post-test. Most counselors and field workers believe that counselor disclosure and counseling in a couple testing situation will reduce domestic violence and the video appears to be successful in communicating this belief. Similarly, the greater belief that couple testing reduces the fear of disclosure is a critical finding too because this fear hides discordancy and allows the spread of the disease within a long term relationship. All but two of the pretests means were above 4 indicating reasonably high awareness of the benefits of couple testing. Still, the video was able to significantly raise awareness further.

CONCLUSIONS

Post-test results, after subjects viewed the video, revealed significant differences from pre-test results, indicating change in the direction of greater alignment of beliefs/intent with those held by health care practitioners who informed the development of the script. The beliefs were about the disease, disclosure, discordancy, counseling processes and benefits of couple testing and intent to test together.

Thus subjects felt an increased seriousness of the disease and of their own risk, greater belief that discordancy can happen and that it is important to disclose one's status and test together as a couple, increased likelihood of trying to convince partner to couple test and to go for the test in the next three months as a couple, and increased confidence in convincing partner and a friend to couple test. The subjects also increased their understanding of the counselor's role during a couple testing visit including the fact that the counselor would provide options for seeking help if the couple is found to be discordant.

The subjects increased their belief in the advantages of couple testing from making disclosure easier to reducing the chance of mother-to-child transmission. Of particular note is the respondents' increased understanding that couple testing reduces domestic violence because this is a major issue in trying to get partners to disclose their status.

The research presented in this paper deals with change at the individual level. It derives from the study of behavior change communication and social marketing interventions, which target individuals with specific messages to effect a hierarchy of changes from cognitions through affections to intent-to-act. Despite the disavowal of disseminatory approaches to social change focused on individual change, this approach continues to be used because it allows greater measurability of effects (Waisbord, 2001). The approach has responded to criticisms of elitism and ethnocentricism by including alternative participatory approaches, which are ideal theory in the field. Thus hybrid models are commonly prevalent in practice today (http://www.comminit.com/). Bandura (2004) has said that the health communication's 'contentious dualism' (p. 159) between individual versus structural approaches to health is not fruitful; rather the field needs both.

The latest approach, social change communication, 'involves the strategic use of advocacy, communication, and social mobilization strategies to facilitate or accelerate social change' (UNAIDS, 2008, p. 91). It does not disregard information diffusion approaches focused on individual level change as it blends 'mass media approaches, community engagement strategies, and empowerment strategies with other forms of informational and motivational communication and advocacy. The goal of social change communication is to act as a catalyst for action at the individual, community, and policy levels' (UNAIDS, 2008, p. 91). Thus communication interventions of the type evaluated in this study will continue to be useful within the context of holistic approaches like social change communication.

The video has demonstrated its effectiveness particularly in communicating the benefits of couple testing. It will be made available in Uganda for use in mass mediated educational programs and in community group sessions (couples together or one member of couples) to be followed immediately by discussion and dialogue, which can be expected to lead to greater internalization of the message. Such internalization could lead to more partner and community dialogue and word-of-mouth (HIV/AIDS Communication Programs, n.d.). If such horizontal dialogue accompanies the viewing of the video, it will help to counter criticism that the message effects may be short term only and that the message itself is vertical (top-down). Papa, Singhal, and Papa (2006) suggest that information "deposits" may genuinely empower the oppressed because the expert offers the information believing that receivers have human potential and will work this information and make it theirs. Dialogue may occur within the group as a result of the information and they will own the social change because it is driven by their conversation and actions.

It will also be recommended to the NGO that further evaluation be conducted to assess whether couple viewing generates greater effects than viewing by one member of the couple. One study has found that couples counseled together were more likely to follow safe practice in mother-to-child transmission situations (Farquhar et al., 2004).

A systematic review of condom promotion interventions revealed that degree of success depended on partnership type (Foss, et al., 2007). For example, condom uptake occurred more among sex workers than in casual relationships and primary partnerships (unless the partner was HIV infected). Thus, for couples, issues related to intimacy, wanting children, etc., could impact use of condoms. Foss, et al. (2007) suggest that couples-focused interventions should have a stronger understanding of 'gender roles, power, communication, intimacy, fidelity, reproduction goals, and family responsibilities' (p. 9). The video intervention of this study did take some of these factors into account. It addressed the larger role played by men in Ugandan society and thus the need for couples to present together for testing, and included among the benefits support for each other and planning for the family and for children. In essence, in a couples intervention, whether in person or mediated, the relationship aspects are of critical importance and need to be considered in depth. In future mediated materials, the issue of intimacy could also be exploited more for a positive outcome by using an emotional appeal. Burton, Darbes, and Operario (2010) have said that because couples-focused approaches to HIV prevention are still in an early phase of development, work is still needed on method and measurement to improve on the state of science for couples-focused HIV prevention.

Despite disagreements about theoretical principles and implementation strategies among communication for social change scholars as well as practitioners, they share the goal of bettering people's lives and the belief that communication is central to engendering social change. International development agencies, donors, policy makers, and governments, on the other hand, do not always fully acknowledge the role of communication, and frame

development problems solely, or at least largely, in technical terms not giving communication due attention (The Rome Consensus, 2007). For example, medicalizing HIV/AIDS (Selwyn & Arnold, 1998) is seen as likely to diminish, detrimentally, the place of communicative solutions. Thus more and more studies demonstrating the usefulness of communication in addressing social change issues need to be conducted.

The evaluation of the intervention was not without challenges. A control group would have added to the validity of the study in theory but under the conditions in the slum the groups would have to be asked to come at separate times leading to possible contamination due to communication among the experimental and control groups' subjects. The same type of contamination could have occurred if the groups were brought to the shed at the same time. This would have also made the group that did not get to see the video feel deprived, and created a rather difficult management situation in terms of keeping track of the different rotating groups. The rotation system used in pretest administration, video viewing, and post-test administration could also be considered a limitation but the conditions simulated field conditions in which this video would be viewed and to that extent lends greater validity to the results. The finding that the mean for subjects' engagement in community discussion increased between pre- and post-test could mean that subjects started discussing the video in the shed as they waited for the post-test and this discussion could be a threat to internal validity. While this is an acknowledged limitation of the study, the likelihood of discussion occurring on the various beliefs that were measured and that exhibited change in the short time available to subjects is small.

The engagement of local partners considerably aided the process of communication with the subjects particularly on sensitive issues. What enabled control was the presence of Ugandan research assistants and NGO staff members who built rapport with the subjects and managed expectations and time in a culturally appropriate way.

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COVERAGE OF "CANCER PATIENTS' ASSOCIATIONS" IN MAJOR NEWSPAPERS IN JAPAN

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The current status of the coverage of "cancer patients' associations" in newspapers has not yet been understood. Using Nikkei Telecom 21's database, we examined the number and content of articles about "cancers" and "cancer patients' associations" published in 6 major newspapers between 2000 and 2009. In total, 258,428 newspaper articles on "cancer" were published between 2000 and 2009. During that period, there were 777 articles on "cancer patients' associations", namely 0.3% of the number of articles on "cancer". Among the articles on "cancer patients' associations", 461 (59.3%) involved specific types of cancers. This number included 286 articles on breast cancers, 40 articles on uterine cancers, 26 articles on lymphoma, 25 articles on ovarian cancers, 22 articles on leukemia, 22 articles on myeloma, 17 articles on colorectal cancers, 17 articles on gastric cancers, and 16 articles on lung cancers. Among the 777 articles, 467 mentioned the names of the patients' associations. They dealt with 192 patients' associations. The 10% most frequently listed patients' associations covered 36% of the total number of

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published articles. This study showed that the issue of "cancer patients' associations" is a major topic in newspapers.

Keywords: healthcare; oncology; educational activities; supportive care; coverage

Cancer is the number one cause of death in Japan. Even when cancers can be cured by medical treatment, there is still the possibility of recurrence, and most patients suffer from the aftereffects of the treatment. In addition, when patients die, this causes sorrow to their families (Shinjo et al.). In such circumstances, patients and their families need someone to confide their sufferings to. But nowadays, families have become increasingly nuclear and more and more people live alone, and in consequence, it is difficult to find someone to turn to for advice.

In Japan, the number of "cancer patients' associations" has increased in recent years. Patients' associations counsel patients and their families, and assume the role of a companion for them to talk to. In addition, some patients' associations occasionally make proposals regarding policies on the healthcare system and approval of new drugs (Rootes & Aanes, 1992).

Although patients' associations are invaluable to cancer patients, the awareness of "cancer patients' associations" by the general public remains unclear. Mass media such as newspapers and television have a significant impact on the formation of public opinion. By conducting a study of published newspaper articles on "cancer patients' associations," we observed how aware society is of patients' associations.

Materials and methods

DATABASE:

Analyses were conducted using the database of Nikkei Telecom 21 (http://telecom21.nikkei.co.jp/).

The contents of articles from newspapers published in Japan are recorded in the basic database of Nikkei Telecom 21. Once the search term is entered, the corresponding data are extracted from the registered "titles", "contents", and "keywords".

Newspapers included in this study:

The study consisted of 6 newspapers: "*Asahi Shimbun*", "*Mainichi Shimbun*", "*Yomiuri Shimbun*", "*Sankei Shimbun*", "*Nihon Keizai Shimbun*" and "*Tokyo Shimbun*". We searched articles published between January 2000 and December 2009.

Search methods:

The number of articles about "cancers" and "cancer patients' associations" was extracted from the total number of articles published in the concerned newspapers during the aforementioned period, and we studied their annual variations.

Articles on "cancers" were extracted using the keyword "cancer". Articles on "cancer patients' associations" were extracted using the keywords ("cancer" AND "cancer patients' associations").

The contents of each article were checked one by one by the researcher (YK), and all articles whose actual contents were unrelated to cancer and cancer patients' associations were excluded from the study. The contents of those articles that remained were examined in detail.

Purpose of this study:

To evaluate society's awareness of "cancer patients' associations" by examining articles on "cancer patients' associations" published in newspapers.

RESULTS

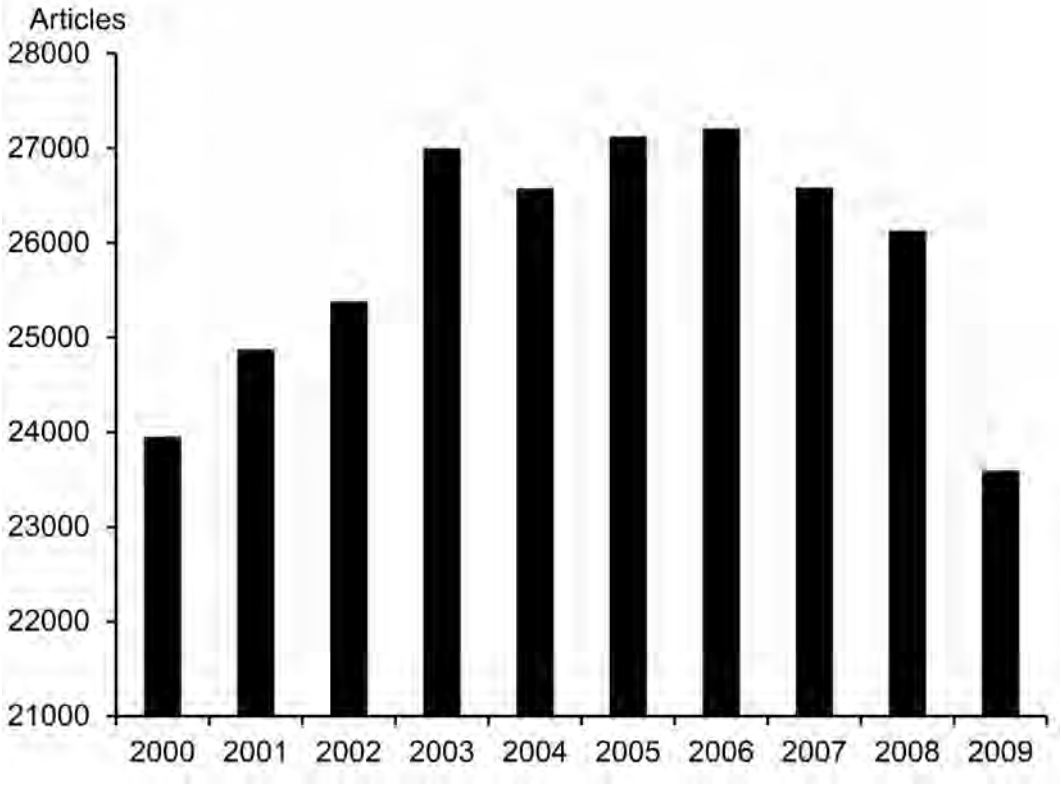
Total number of articles and its annual trends

The total number of articles on "cancer" published between 2000 and 2009 was 258,428. The median annual number of articles was 26,354 (23,595-27,209), with a bimodal peak in 2003 and in 2006 (Figure 1).

The number of articles on "cancer patients' associations" was 777 between 2000 and 2009, accounting for 0.3% of the articles on "cancer." Both the number of articles on "cancer patients' associations" and their percentage number compared to articles on "cancer" showed an increasing tendency until 2008 (Figure 2).

Regarding the number of articles on "cancer patients' associations" accounted among the articles on "cancer," a maximum difference of 8.4 times was found (in the year 2004) between the newspapers with the highest number of published articles and those with the

Figure 1



smallest number of published articles (Figure 2).

About the types of cancers

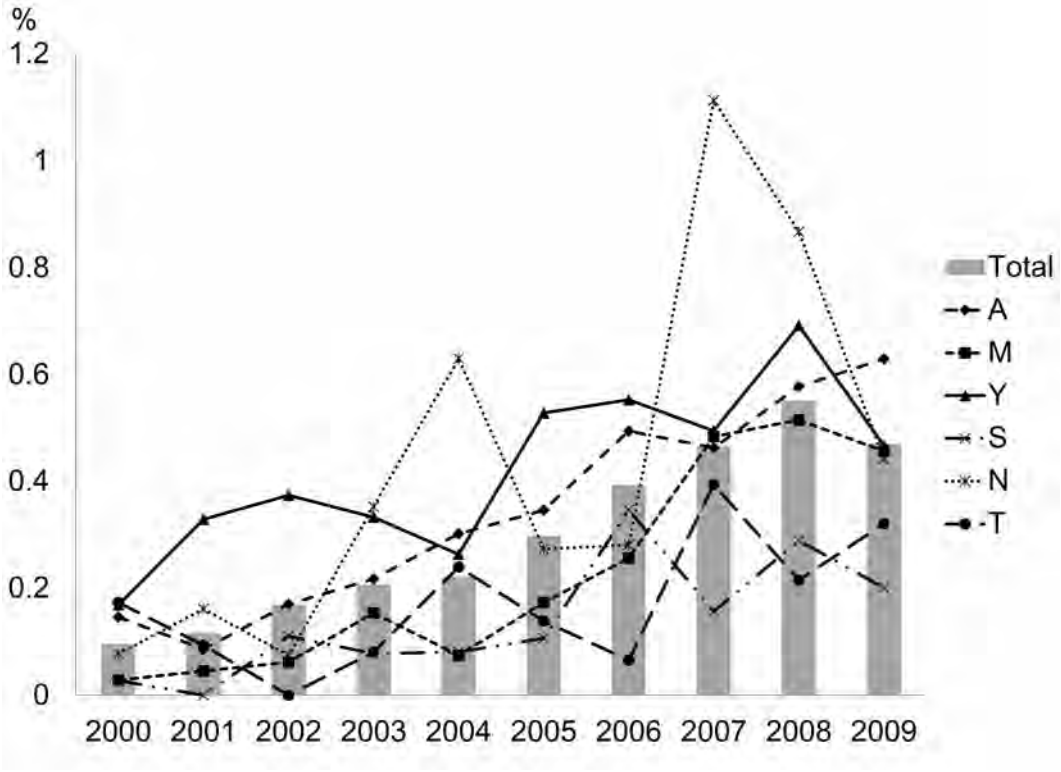
Of all the articles on "cancer patients' associations," 461 (59.3%) were about specific cancers. These included 286 articles on breast cancers, 40 on uterine cancers, 26 on lymphoma, 25 on ovarian cancers, 22 on leukemia, 22 on myeloma, 17 on colorectal cancer, 17 on gastric cancer, and 16 on lung cancers.

Figure 3 shows the annual trends in the number of articles on each type of cancer. Throughout the observation period, articles on breast cancers were in large numbers and increased rapidly.

About the listed patient advocacy groups

The names of 192 different patients' associations were mentioned in 467 of the 777 articles. Of these, 95 were cancer patients' associations for specific breast cancers. The

Figure 2



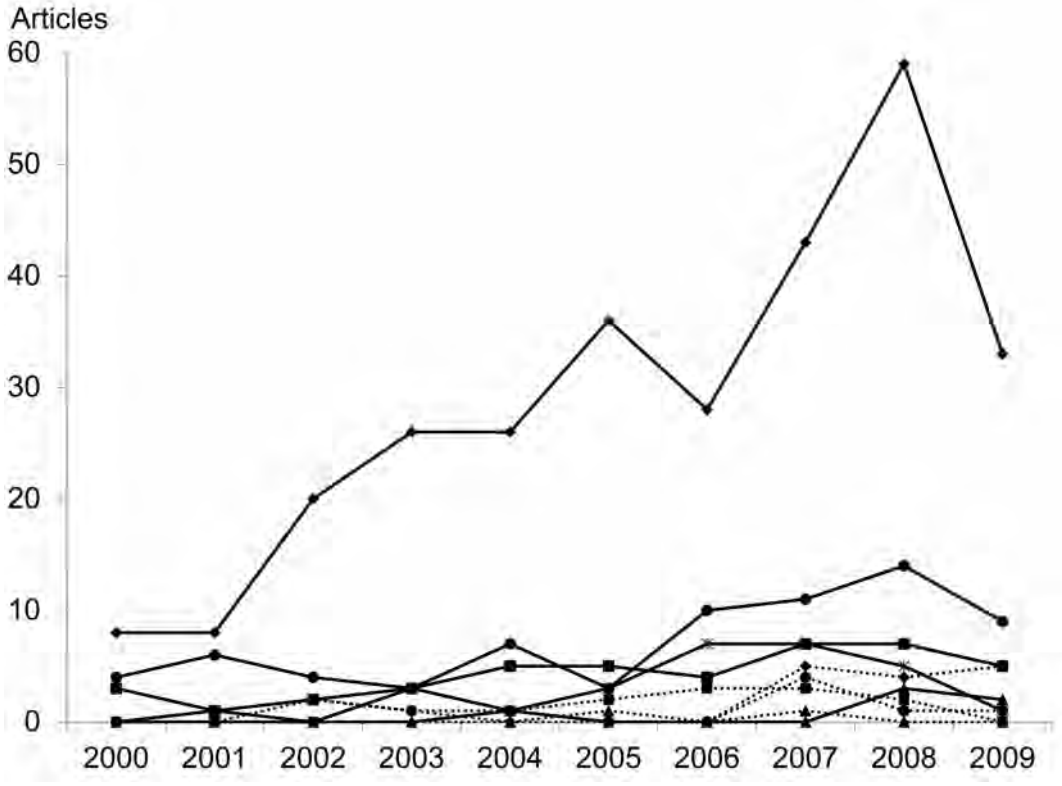
purpose of the groups was to interact with patients. Incidentally, breast cancer patient advocacy groups were in the second place, with 20 articles published. Ten percent of the most frequently mentioned patients' associations (n = 22) accounted for 6% (n = 282) of all the articles.

Contents

The articles were roughly categorized into the following genres: "articles showing patients' personal opinions," "event reports," "book reports," "obituaries/eulogies," and "other articles," and the number of articles in each category was 220, 206, 46, 9, and 296, respectively.

The contents of the articles were as follows: "interactions with patients" (390 articles), "petitions to the government regarding the administrative system for new drugs and healthcare" (69 articles), "educational activities conducted by patients' associations" (53 articles), "government support for patients' associations" (88 articles), "results of research studies on patients' associations" (23 articles), and "others" (93 articles).

Figure 3



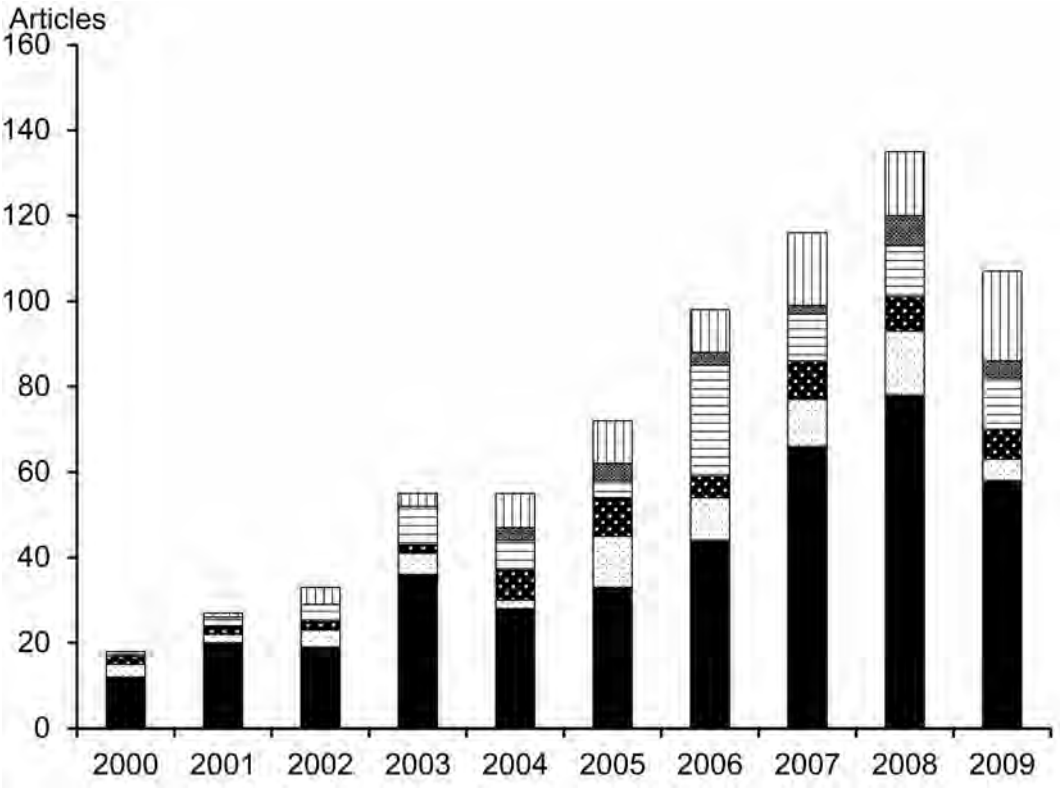
The contents of the articles and their annual variations are shown in Figure 4. Articles on interactions with patients were in large numbers throughout the period of study; however, from 2005 on, there has been an increasing number of articles on the healthcare system.

DISCUSSION

This study showed that the issue of "cancer patients' associations" is a major topic in newspapers. Although there were significant differences between each newspaper publishing company (Figure 2), articles appear in 6 major newspapers at an average frequency of once a week. Since most articles are published in printed form and on the Internet, most citizens are presumably aware of the existence of "cancer patients' associations" through newspapers.

The number of articles on cancer patients' associations increased monotonically until 2008. The decrease in the number of articles in 2009 was because of the effect of the H1N1 influenza pandemic and was most likely transient. These facts suggest that the significance

Figure 4



of obtaining information from the perspective of patients through cancer patients' associations is being acknowledged by society. However, the number of articles on "cancer patients' associations" is still small compared to that of articles on "cancer." Throughout the study period, articles on "cancer patients' associations" accounted only for 0.3% of articles on "cancer." Most articles on "cancer" are based on interviews of people with knowledge of the medical field and are posted on websites under the category of diagnosis and treatment (Kishi et al., 2008). Most newspaper reports on cancers still offer views from the perspective of health care providers and might not sufficiently reflect the needs of patients.

The majority of "cancer patients' associations" quoted in newspapers are relevant to breast cancers, followed in the second place by uterine cancers, which are much lesser in number. The number of articles on breast cancer patients' associations increased remarkably in recent years. In 2008, their number was about 6 times higher than that in 2000. This situation is consistent with the fact that the activities of breast cancer patients' associations were also popular in other countries (Sandaunet, 2008a, 2008b; Stang & Mittelmark, 2009; Waller & Batt, 1995). The fact that patients seek a lot of information is presumably related to the fact that patients with breast cancers are young in average age (Saeki et al., 2008) and

that a number of new treatments have been developed (Larionov & Miller, 2009; Sanchez-Munoz et al., 2009; Zakhireh, Fowble, & Esserman). This is also consistent with the fact that uterine cancers were in the second place, followed by malignant lymphoma and ovarian cancers. Effective prophylaxis and new drugs have been developed against such cancers.

Meanwhile, there were few articles on "cancer patients' associations" for cancers with a high morbidity rate, such as cancers of the lung, colon, and stomach. It is unclear whether this is because of the low number of cancer patients' associations or the difficulty of discussing the activities of cancer patients' associations in newspapers. Either way, the role of newspapers in distributing information on "cancer patients' associations" is limited.

This study showed that patients' associations specific to cancers could have a significant impact in promoting the image of patients' associations in general. The articles on breast cancer patients' associations were the most frequently published ones, accounting for 12% of the total number of articles. In addition, 10% of the patients' associations with the highest frequency accounted for 36% of the total number of articles. The realities of patients' associations are diverse and so are the needs of patients and their families (Rootes & Aanes, 1992). However, newspapers often give a symbolic account of minor patients' associations. Considering this, newspapers have a limited role in providing information on "cancer patients' associations", which are really needed by patients and their families. There is need to develop media to complement newspapers. Focus has also been placed on new media such as the Internet (Narimatsu et al., 2008) and free papers (Biocca, 2000).

The articles on "cancer patients' associations" were of various formats and contents. However, most formats were "articles on patients' personal opinions" and "event reports." Newspapers publish these in the form of patients' opinions. Publishing specific events in high-circulation newspapers will have a significant advertising effect. Most newspapers deal with specific patients' associations, and therefore, if events organized by such patients' associations are reported in the news, it will not be surprising that such organizations will grow rapidly. These facts suggest that newspaper reports may have a major influence on patients' associations.

Meanwhile, most of the contents of articles on "cancer patients' associations" were about "interactions." Those articles advocated for the "cancer patients' associations" themselves. Interestingly, since 2006, there have been more and more articles on "government support for patients' associations". This is presumably the effect of the establishment of the *Basic Plan to Promote Cancer Control Programs* (Honda, 2008) by the government in 2006.

CONCLUSION

This study showed that "cancer patients' associations" are a major topic in

newspapers. But because of the small number of articles about them, there might be a bias in the types of cancers and contents of the news reports. An organic cooperation between newspapers and other media is necessary so that the public can share information about cancer patients' associations.

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