EFFECTS OF HEALTH MESSAGE FRAMES AND CULTURAL APPEALS ON INFLUENZA PREVENTION: A CROSS-COUNTRY INVESTIGATION

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by
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ABSTRACT

This dissertation was designed to advance the understanding of communication strategies for disease prevention by considering the combined effects of health message frames (loss versus gain frames) and cultural appeals (individualistic versus collectivistic appeals). Furthermore, it aimed to investigate the effects of these persuasive messages among members from different societies (the United States and Hong Kong).

The results of the two studies (the United States and Hong Kong) showed that exposure to gain-self and loss-other messages could heighten people’s intention to get a flu vaccination. The significant interaction between message frames and cultural appeals indicated that the effect of message framing in motivating preventive behaviors could be moderated by the cultural values embedded in the messages. Messages focusing on individualistic gains and collectivistic losses successfully increased people’s intention to get a flu vaccination.

Moreover, the study in the United States found that the behavioral intention driven by the gain-self and loss-other messages were mediated by a set of variables. Specifically, for Americans, in order to promote preventive behaviors against influenza, the messages should be able to generate more favorable thoughts and positive attitudes toward the preventive behavior. For Hong Kong Chinese, the advantage of the gain-self and loss-other messages in promoting the preventive behavior against influenza lies in making people believe that influenza is a severe health problem, and enhancing their favorable attitudes toward the flu vaccination. Additionally, behavioral intention could be motivated only if Hong Kong Chinese could process the message easily. Theoretical and practical implications of the study were discussed.
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Chapter 1
Introduction

The U.S. Centers for Disease Control and Prevention plans to spend about 160 million dollars in 2009 to further understand influenza and the effective strategies to prevent it (CDC, 2009, p. 38). Efforts to prevent the health risk of diseases like influenza largely depend on strategies that can effectively initiate behaviors to protect people from getting infected with the disease. Over the past two decades, scholars have contributed their efforts by investigating particular types of messages that may effectively encourage people to adapt healthy behaviors (Rothman & Salovey, 2007).

One of the valuable strategies in systematically influencing various health prevention and detection behaviors is to alter the framing of the persuasive communications (for a review, see Rothman, Bartels, Wlaschin, & Salovey, 2006). Specifically, message framing theory suggests that potential benefits or good outcomes of compliance would motivate prevention behaviors, and that potential losses and negative consequences of non-compliance would motivate detection behaviors (for a review, see Rothman, et al., 2006).

However, very few studies associated with health communication have considered the potential influence of cultural appeals when they are blended into the message. As applied to cultural psychology, the idea of cultural appeal refers to the messages that can fit or reflect the cultural orientations of people (Han & Shavitt, 1994). Therefore, how cultural appeals might interact with message frames, and whether the effect of health message frames could function across cultures remained unexplored.

Specifically, the current research was designed to advance the understanding of communication strategies for disease prevention by considering the combined effects of health
message frames (loss versus gain frames) and cultural appeals (individualistic versus
collectivistic appeals). Furthermore, it aimed to investigate the effects of these persuasive
messages among members from different countries with different cultural orientations.

Influenza was chosen as the focal issue of this project for its massive and devastating
impact on societies. The Centers for Disease Control and Prevention in the United States reports
that 5% to 20% of the U.S. population is affected by influenza every year (CDC, 2008). In the
United States alone, influenza causes 36,000 deaths and more than 200,000 hospitalizations
every year (CDC, 2008). The World Health Organization stresses that influenza is a world-wide
health concern and affects 5% to 15% of the global population annually (WHO, 2009).

The prevention of the spread of the influenza viruses is challenging, because it is quickly
spread through coughing or sneezing. People may become infected by touching an object
covered with influenza viruses and then touching their noses or mouths (CDC, 2008). High-risk
groups for influenza include children aged 6 months or above, those aged 50 or above, and those
experiencing chronic medical complications (CDC, 2008). People who frequently interact with
large groups, such as health care workers, school teachers, and students are also considered at
risk (CDC, 2008).

Those at risk are urged to get a flu vaccination before the flu season in order to protect
themselves (Fiore et al., 2004). However, the immunization rate remained low in the United
States. The National Immunization Survey conducted in 2007 revealed that only 37% of
Americans, aged 18 to 49, received a flu vaccine during the 2006-2007 flu season (Euler, Lu, &
Singleton, 2008).
One of the unique characteristics of influenza is that it’s highly infectious. Once one gets infected, the virus can easily spread to a large group by a sneeze, a cough or a hand shake (CDC, 2008). In this case, getting a flu vaccination protects not only oneself but a large number of people; skipping one can put oneself and many at risk.

The ultimate goal of this research is to seek an effective strategy to communicate the risk of influenza and persuade people to put efforts in preventing the disease. In addition, this study intends to extend the existing body of research on message framing theory and looks at how message frames may interact with cultural appeals. To investigate the persuasive effectiveness of message frames and cultural appeals, two experimental studies were conducted in the United States and in Hong Kong. The next chapter includes a review of the previous literature on message framing theory, cultural psychology and their theoretical effects. Chapter 3 and 4 report the methods and results associated with the two experiments. The final chapter includes a discussion of the theoretical and practical implications.
Chapter 2
Literature Review

Message Framing Theory

The phrase “message framing” has been used to describe different types of message variations. As applied to research in health communication, it normally refers to gain- or loss-framed messages. Conceptually, the gain frame focuses on the benefits of adopting the advocated course of action, whereas the loss frame emphasizes the costs of failing to perform the advocated course of action (O’Keefe & Jensen, 2006; Rothman et al., 2006). The following discussion includes a review of literature associated with message framing theory.

Prospect theory

The framing postulate of prospect theory has been used as a guide for many studies regarding persuasive messages and how they may facilitate initiation of a healthy behavior or maintenance of a current healthy behavior. Prospect theory suggests that people tend to avoid risks when potential gains or benefits are salient, but tend to take risks when potential losses or costs are salient (Tversky & Kahneman, 1981). When applied to the arena of health communication, the theoretical framework constructed by prospect theory allows researchers to develop the message framing theory to predict a message’s persuasive impact on people’s behavioral decisions.

According to prospect theory, people can be either risk-averse or risk-seeking depending on how their behavioral preferences are motivated. If a message emphasizes the potential benefits or positive outcomes of a particular behavior, people’s inclination to avoid risks will be motivated. If a message emphasizes the potential losses and negative consequences of a
behavior, people’s willingness to take risks will be motivated (Rothman, et al., 2006; Rothman & Salovey, 1997; Salovey, Schneider, & Apanovitch, 2002).

According to message framing theory, health messages can focus on either the benefits of adopting a health behavior (a gain frame) or the costs of not performing the behavior (a loss frame). The conceptualization of message framing stresses the gains of compliance and the losses of non-compliance (Rothman et al., 2006; Rothman & Salovey, 1997; Salovey et al., 2002).

Additionally, the effects of these two framing strategies lie in how the salience of gains or losses is activated in people’s mindsets. Rothman et al. (2006) extended this approach to the domain of health.

Two types of behaviors

In the health context, detection of a health problem is associated with a possible negative outcome, whereas prevention of a health problem is associated with a possible positive outcome. Detection behaviors are often associated with the goal of finding out one’s potential health problems. As such, both the process and the outcomes of a detection behavior might be unpleasant. Therefore, the negative consequence or loss is more likely to be salient for people when they think about detection behaviors (e.g. chest x-ray examination). Prevention behaviors may evoke the goal for maintaining a current healthy condition or averting the onset of potential health problems. The prevention behavior itself and the associated outcomes are likely to be perceived as positive. Therefore, when people think about prevention behaviors, positive outcomes or gains tend to be salient and more accessible in their minds (e.g. to get a flu
vaccination to stay healthy) (O’Keefe & Jensen, 2006; Rothman, et al., 2006; Salovey, et al., 2002).

However, the prevention-detection distinction can be shifted depending on how people construe the goal of a behavior. For example, HIV testing is generally considered an early detection behavior. According to message framing theory, the persuasive communication emphasizing the costs of not doing the test should be more effective because people tend to take risks when there is potential loss. However, Apanovitch, McCarthy, and Salovey (2003) found the opposite pattern – the gain-framed messages were more effective in motivating people to do the HIV testing. The rationale for this finding was that the female participants indicated that they wanted to take the HIV test so as to prevent their partners from getting the disease. In this context, the HIV test was not construed as an early detection behavior, but more as a preventive behavior. Therefore, this finding is still consistent with the basic hypothesis of message framing theory -- gain frames should be more effective for activating prevention behaviors and loss frames should be more effective for motivating detection behaviors (Apanovitch, et al., 2003).

A series of empirical studies has shown that loss frames are more effective than gain frames in promoting detection behaviors such as mammography (Banks, et al., 1995; Schneider et al., 2001), breast self-examination (BSE) (Meyerowitz & Chaiken, 1987), skin cancer examinations (Block & Keller, 1995), HIV-testing (Kalichman & Coley, 1995), use of plaque-detecting disclosing rinse (Rothman, Martino, Bedell, Detweiler, & Salovey, 1999), and blood-cholesterol screening (Maheswaran & Meyers-Levy, 1990). However, the framing effect of loss frames on detection behaviors could be moderated by factors such as family history (Finney & Iannotti, 2002), race or income (Consedine, Horton, Magai, & Kukafka, 2007; Schneider, et al.,
2001), the certainty of the outcome (Apanovitch, McCarthy, & Salovey, 2003), the anecdotal feature of health messages (Cox & Cox, 2001), and perceived risks (Meyerowitz, Wilson, & Chaiken, 1991).

The advantages of gain frames in promoting preventive behaviors have been supported by studies of message framing effects across several domains, such as the use of sunscreen to prevent skin cancer (Detweiler, Bedell, Salovey, Pronin, & Rothman, 1999; Rothman, Salovey, Antone, Keough, & Martin, 1993), the use of condoms (Kiene, Barta, Zelenski, & Cothran, 2005), smoking cessation (Wong & McMurray, 2002), and regular physical exercise (Jones, Sinclair, & Courneya, 2003). The persuasive impact of gain frames could also be moderated by cultural characteristics of uncertainty avoidance (Reardon, et al., 2006), issue involvement (Kiene, et al., 2005), and source credibility (Jones, Sinclair, & Courneya, 2003).

In sum, prospect theory predicts that people can be either risk-averse or risk-seeking, depending on how their behavioral preferences are motivated. If a message emphasizes the potential benefits or positive outcomes of a particular behavior, people’s inclination to avoid risks will be motivated. If a message emphasizes the potential losses and negative consequences of a particular behavior, people’s willingness to take risks will be motivated. Moreover, the persuasive influence of gain or loss frames is sensitive to the characteristics of the targeted health behaviors (i.e. prevention or detection behaviors) (for a review, see O’Keefe & Jensen, 2006; Rothman, et al., 2006; Salovey, et al., 2002). Within this framework, gain-framed messages are expected to be more effective when promoting prevention behaviors and loss-framed messages will be more effective when promoting detection behaviors.
The present study focuses on a preventive behavior – to prevent influenza by getting a flu shot. Given that getting a flu shot is a preventive behavior, the gain frame should be more effective than the loss frame. However, one of the recent meta-analytic pieces from O’Keefe and Jensen (2004) suggested that the advantage of gain frame in motivating prevention behavior is not entirely certain, given that “the observed mean effect size \( r = .046 \) is not large in absolute terms” (p. 23). Would other factors such as cultural values carried by health messages moderate the effect of message frames?

*Culture and Health Communication*

In recent years, there has been a growing recognition of the important role of culture as one factor that may influence the effectiveness of public health campaigns. Kreuter and McClure (2004) argued that “ideally, diversity and culture should be taken into account at each of these decision points when developing campaigns that target culturally diverse population subgroups” (p. 439). The authors continued to state that health messages should be tailored to accommodate “a group’s cultural values and beliefs” (p. 446) in order to be meaningful to the targeted audience.

Along with this increased attention to the critical role of culture in public health campaigns, researchers in health communication have started to investigate how to effectively communicate health risks to a specific ethnic group (Huerta & Macario, 1999; Kalichman & Coley, 1995), or to a group of people with a similar socioeconomic status (Erwin et al., 1996).

Huerta and Macario (1999) emphasized the importance of adding cultural values to health communication messages in order to reach the targeted ethnic group. They suggested that messages targeting Hispanics should be associated with the core values of the Hispanic group,
such as family-oriented value, collectivism (e.g. the significance of friends and extended family),
group harmony, and less confrontation. They argued that it is essential to understand that “people
are the product of past experiences, cultural beliefs, and cultural norms and thus culturally
unique” (p. 23). Therefore, health information needs to be “culturally appropriate.”

Cultural appropriateness can also reflect upon the format and content of the health
communication. Resnicow, Baranowski, Ahluwalia, and Braithwaite (1999) defined a concept
called “cultural sensitivity.” There are two dimensions for this concept: surface structure and
deep structure. The surface structure states that people may be more reactive to the content of a
health message if it looks culturally close and familiar, such as language, music, food, locations,
and clothing. Deep structure, however, is rooted in cultural or other social influences that may
shape the values of the targeted audience. The authors suggest that matching both the surface and
deep structures of content is a necessary and important step to enhance the reception or the
acceptance of the health promotion materials (Resnicow et al., 1999).

Although the significance of cultural influence on communicating health messages has
attracted increasing attention from both communication scholars and public health practitioners,
most of the current research on the influences of cultural factors in health communication has
emphasized a specific minority group or a subgroup in the United States (e.g. African-
Americans, females, or low-income people). Cross-cultural examination of the effectiveness of
health information is still scant and inadequate.

The current project aimed at going beyond the scope of investigating the subcultures
within the United States by investigating the persuasiveness of health message appeals among
people from two culturally different countries (Americans versus Chinese). In addition, the
author hoped to investigate whether tailoring health messages to fit the cultural values of people from a particular culture (e.g. individualistic appeals for people from an individualist country) would enhance the effectiveness of a persuasive health message and how this might interact with the effect of message frames.

**Individualism and Collectivism**

Over the past two decades, the cultural dimension of Individualism and Collectivism has been central to cross-cultural research and has attracted substantial attention from scholars from consumer psychology, cultural psychology, marketing, and communications (for a review, see Aaker, 2006; Oyserman, Coon, & Kemmelmeier, 2002; Shavitt, Lalwani, Zhang, & Torelli, 2006; Triandis, 1995).

Individualism is defined as “a concern for oneself and immediate family, and emphasis on personal autonomy and self-fulfillment, and the basing of one’s identity on one’s personal accomplishments” (Oyserman, et al., 2002, p. 4). On the other hand, rather than seeing Collectivism as a simple opposite of Individualism, researchers tend to focus on the consequences of Collectivism when defining this concept. For example, people from a collectivistic society may share more common goals or values than those from an individualistic society.

Aaker and Maheswaran (1997) summarized the different attitudinal and behavioral tendencies between people with individualistic or collectivistic orientations in a more systematic manner. They suggested that people in individualistic cultures would perform certain behaviors in order to stand out from a group or to satisfy their personal needs. By contrast, people in collectivistic cultures tend to be similar to others and maintain the “harmony” within the group.
(p. 316). Furthermore, the role of others was more salient in collectivistic cultures (e.g. relationships with others can affect personal preference) than in individualistic cultures. The values of collectivistic cultures emphasized connectedness and relationships between people, whereas the values of individualist cultures focused on separateness and individuality (Aaker & Maheswaran, 1997).

**Three dichotomies**

Although the terms Individualism and Collectivism have been used in a variety of studies, the ways that they were conceptualized were slightly different among various studies. Shavitt et al. (2006, p. 326) suggested that there were three well-established dichotomies that were used to conceptualize Individualism and Collectivism. They comprised 1) *national culture* (e.g. Western versus Eastern cultures, such as the United States and Japan); 2) *individual differences in cultural orientation* (e.g. individualists versus collectivists); and 3) *salient self-construal* (e.g. independent versus interdependent views).

Despite conceptual differences among the three pairs of Individualism and Collectivism, scholars have found that all three levels of distinctions could yield similar effects on information processing and persuasion (Shavitt et al., 2006). Oyserman, et al. (2002) summarized the core assumption of Individualism as “individuals are independent of one another” (p. 4), whereas the core assumption of Collectivism was that “groups bind and mutually obligate individuals” (p. 5).

In sum, Collectivism incorporates a sense of belonging and duty to the group, interdependence with group members, seeking harmony within the group and avoiding conflicts. Individualism includes a tendency to distinguish self from others and features a dominance of
self-reliance, and values self-interest and personal goals (Hofstede, 1980; Markus & Kitayama, 1991; Oyserman, 1993; Oyserman, et al., 2002; Triandis, 1995).

Numerous studies have suggested that the cultural distinctions (e.g. Individualism versus Collectivism) among people could have an impact on how they perceive, understand, and process information and on how they make related evaluations, judgments and choices (for a review, see Markus & Kitayama, 1991; Oyserman, et al., 2002; Shavitt, et al., 2006). These impacts could be moderated by people’s regulatory focus (Aaker & Sengupta, 2000; Lee, Aaker, & Gardner, 2000), level of elaboration (Briley & Aaker, 2006), and novelty of the appeals (Aaker & Williams, 1998, study 2). Matching message appeals with people’s cultural beliefs and values has been found to make the appeals more attractive and favorable (e.g. Han & Shavitt, 1994). The following discussion focuses on reviewing the literature pertaining to cultural distinctions on information processing and the persuasive effect generated by strategically designed cultural appeals.

Matching appeals with cultures

Some studies found that certain persuasive appeals were compelling to some cultures but not to others (for a review, see Oyserman, et al., 2002). For example, Han and Shavitt (1994, study 2) conducted a study among 64 Americans and 65 Koreans. Four pairs of advertising stimuli for four different products were used in the study, including chewing gum, running shoes, detergent, and clothes irons (the first two were personal products, the others were shared products). For each product two different ads were produced that featured the characteristics of the values of Individualism and Collectivism, respectively. For example, for the chewing gum, the headline of the individualistic ad stated “Treat yourself to a breath freshening experience”,

and the collectivistic ad stated “Share the breath freshening experience.” For the running shoes, the individualistic ad had the headline: “Easy walking. Easy exercise. It’s easy when you have the right shoes,” and the collectivistic ad’s headline was “Easy walking. Easy exercise. The shoes for your family.” Pictures of individuals were included in the individualistic ads, whereas pictures of groups of people were included in the collectivistic ads (Han & Shavitt, 1994).

The results showed that ads emphasizing individual benefits were more persuasive for Americans, whereas Koreans were more persuaded by ads emphasizing collective benefits. American participants also favored the individualistic ads more than Koreans, whereas Koreans did not reveal a significant preference between the two types of ads. However, the effect observed might be moderated by product types (e.g. personal products versus shared products). For shared products, the collectivistic ads were more preferred and more persuasive for Korean participants, whereas the individualistic ads were more favored and more persuasive for American participants. For personal products, both Americans and Koreans favored individualistic ads (Han & Shavitt, 1994). The authors suggested that in order to make a message appeal effective and compelling, the values embedded with the appeals should be compatible with people’s basic cultural orientations (Han & Shavitt, 1994).

Zhang and Gelb (1996) also suggested that advertising appeals should be designed to match cultural orientations. Focusing on the cultural dimension of Individualism and Collectivism, the authors designed two different ads (individualistic versus collectivistic) for each of the two products: a still camera and a toothbrush. The headline for the individualistic ad was “Come and Indulge in the Joy of Self-expression,” whereas the headline for the collectivistic slogan was “Share the Moments of Joy and Happiness with your Friends and Family.” For the
toothbrush, the collectivistic ad featured “Everybody Likes the Brand Name Flexbrush”, whereas the individualistic ad featured “Reach Out for the Pleasure of Brushing.”

The result of the study demonstrated that, for the photo camera ads, Americans showed no difference in their preference toward the two ad appeals, whereas Chinese preferred the collectivistic ad appeal. However, when the ads were for a personal product (e.g. a toothbrush), both Chinese and Americans favored the individualistic appeal. The authors argued that more favorable attitudes toward the ad and the brand were found when the ad appeals were congruent with the cultural preferences than when they were incongruent, especially for the group-use products (e.g. camera) (Zhang & Gelb, 1996).

Agrawal, Menon, and Aaker (2007, study 4) conducted a study among American participants and measured their tendencies of holding either more interdependent or independent views. The participants were also randomly exposed to two appeals, one with family values and the other with individualistic values (i.e. self). They discovered that when the message was compatible with people’s interdependent/independent construal, it tended to be more effective.

In sum, the literature in marketing and advertising research suggests that making message appeals compatible with people’s basic cultural orientations would be necessary to allow a message appeal to be effective and compelling (Agrawal, et al., 2007; Han & Shavitt, 1994; Zhang & Gelb, 1996). Does this theory also apply to the communication of health risks?

Primary Goal, Hypotheses, and Research Questions

The current project aims at incorporating cultural influence on communicating health risks and promoting preventive behaviors, specifically to urge people to get flu shots to prevent influenza. The postulation here is that when the health messages fit people’s cultural values, the
persuasive messages will be effective. Based on the evidence presented in the cultural psychology studies (Han & Shavitt, 1994; Zhang & Gelb, 1996), this assumption might be suitable. However, further empirical work needs to be done to test this assumption in the context of health. That is one of the goals of this study. In addition, much research has pointed out that gain frames have their advantages in promoting preventive behaviors (Rothman et al., 2006). However, whether this advantage would interact with cultural appeals (i.e. individualistic / collectivistic appeals) has not yet been tested. That is another goal of this project, which could serve as a new contribution to this area of research.

Effects of message frames

The focal issue of this study is to prevent influenza by getting a flu shot. Therefore, it is a preventive health issue. According to prior research on message framing, if the goal of the health behavior is to prevent unhealthy conditions, gain frames are predicted to be more effective than loss frames (Rothman et al., 2006). Besides the assessment of behavioral intention, perceived message effectiveness and the attitude toward the advocated behavior were also considered as primary outcome variables and were treated as a set of variables to represent the overall persuasive effects. Therefore, the following hypotheses were proposed:

\( H1 \): For people from an individualistic society, the gain frame will be more persuasive than the loss frame, such that the gain frame will lead to (A) higher perceived message effectiveness; (B) more favorable attitude toward the advocated behavior; and (C) higher behavioral intention.

There is no empirical evidence suggesting that the advantage of gain frames in motivating preventive behaviors would vary across cultures. In addition, the majority of the
literature revealed a positive effect of gain frames in promoting preventive behavior (Rothman et al., 2006). Therefore, this study proposed:

\[ H2: \text{For people from a collectivistic society, the gain frame will be more persuasive than the loss frame, such that the gain frame will lead to (A) higher perceived message effectiveness; (B) more favorable attitude toward the advocated behavior; (C) higher behavioral intention.} \]

*Effects of cultural appeals*

Cultural psychology literature suggests that message appeals that fit people’s cultural orientations are perceived to be more effective and appealing than those that do not fit (Agrawal, et al., 2007; Han & Shavitt, 1994; Zhang & Gelb, 1996). In other words, people seem to be more reactive to messages that are compatible with their cultural values. Individualistic value stresses a pursuit of personal needs and the concept of self is more salient. On the other hand, collectivistic value emphasizes group harmony and the role of others is more salient (Han & Shavitt, 1994; Zhang & Gelb, 1996). Therefore, people from an individualistic society seemed to react more to self-orientated messages, whereas people from collectivistic society seemed to be more responsive to other-oriented messages (Han & Shavitt, 1994; Zhang & Gelb, 1996). Therefore, the following hypotheses were proposed:

\[ H3: \text{For people from an individualistic society, the self appeal will be more persuasive than the other appeal, such that the self appeal will lead to (A) higher perceived message effectiveness; (B) more favorable attitude toward the advocated behavior; and (C) higher behavioral intention.} \]
*H4:* For people from a collectivistic society, the other appeal will be persuasive than the self appeal, such that the other appeal will lead to (A) higher perceived message effectiveness; (B) more favorable attitude toward the advocated behavior; and (C) higher behavioral intention.

**Research questions**

Another purpose of the study is to investigate the possible interaction between messages. Two research questions were raised:

*RQ1:* For people from an individualistic society, will there be an interaction effect between gain-versus-loss frames and self-versus-other appeals on perceived message effectiveness, attitude toward the advocated behavior, and behavioral intention?

*RQ2:* For people from a collectivistic society, will there be an interaction effect between gain-versus-loss frames and self-versus-other appeals on perceived message effectiveness, attitude toward the advocated behavior, and behavioral intention?

**Message mediation**

Besides testing the proposed hypotheses and investigating the research questions, this study also tried to explore the underlying mechanism that could explain why exposure to message frames and cultural appeals could lead to attitudinal and behavioral changes.

*Cognitive thoughts.* From the perspective of cognitive response theory, people may generate different types of thoughts when they are exposed to persuasive messages (Petty & Cacioppo, 1981). These thoughts can be favorable, unfavorable, neutral, or irrelevant to the messages. Furthermore, the cognitive response theory suggests that the balance of favorable or unfavorable thoughts could determine the success of the persuasive message (Oskamp & Schultz, 2005; Petty & Cacioppo, 1981). In other words, the cognitive thoughts that come to
people’s minds after viewing a persuasive message can be crucial to the effectiveness of the message.

The mediating role of the cognitive responses in persuasion has been investigated in the context of health communication (Dillard, Shen, & Vail, 2007; Rothman, et al., 1999; Smith & Petty, 1996). Rothman, et al. (1999) suggested that the valence of people’s thoughts after viewing gain or loss messages could mediate the effect of message framing.

Perceived message effectiveness. Dillard, Weber, & Vail (2007) revealed that perceived message effectiveness itself could be a strong indicator of actual persuasion. Many persuasion studies considered perceived message effectiveness as a primary outcome variable of message intervention (Cesario, Grant, & Higgins, 2004; Dillard & Hullett, 2004; Peck, 2000). Conceptually, the notion of perceived message effectiveness was defined as an overall judgment of a message. The operationalization of perceived message effectiveness normally contained two dimensions: impact and attribute (Dillard, Weber, & Vail, 2007). Impact measures access whether the message was considered as effective or compelling, whereas the attribute measures evaluate the perceived message. Many studies have used both the impact and attribute measures to access perceived message effectiveness (Dillard, Weber, & Vail, 2007).

In sum, the previous literature suggests that the degree to which people judge the induced message to be effective and persuasive is an important variable to be investigated (Dillard, Shen, & Vail, 2007; Dillard, Weber, & Vail, 2007). In the current study, perceived message effectiveness was treated as one of the major outcome variables and a potential mediator for the persuasive effect of message frames and cultural appeals.
**Attitude toward the advocated behavior.** Rothman et al. (1999, experiment 2) tested the interaction between health behavioral types and the message valence. In their study, the use of mouth rinse was framed to be either preventing gum disease or detecting gum problems, and mixed with gain- and loss-framed appeals. The researchers revealed that in promoting the purchase and the use of preventive mouth rinse products, gain-framed messages were more effective than loss-framed messages. In addition, the authors discovered that the effect of message framing on behavioral intention was significantly mediated by participants’ attitudes toward the health behavior (Rothman, et al., 1999).

**Perceived severity.** Perceived severity has been identified as an important indicator of health-related behavioral intention in the Health Belief Model (Glanz, Rimer, & Lewis, 2002). The underlying rationale is that people need to perceive a health problem as severe or significant before they will perform any further actions. In the case of influenza, one of the reasons for the low vaccination rate is that people may not believe that influenza is a serious health condition. Many people who do not have chronic health problems can recover from influenza within one or two weeks without any medical treatment (WHO, 2009). In a study examining psychological factors that influence people’s behavioral intention in a swine influenza campaign, Cummings, Jette, Brock, & Haefner (1979) suggested that perceived severity was positively associated with behavioral intention. Perceived severity was also found to be a consistent predictor of AIDS prevention behavior in longitudinal studies (Allard, 1989; Montgomery et al., 1989).

In order to understand the underlying mechanism of how induced persuasive messages can promote health behaviors, the study proposed the following research questions:
RQ3: Will the following factors: (A) cognitive responses, (B) perceived message effectiveness, (C) perceived severity, and (D) attitude toward the advocated behavior mediate the persuasive effect of message frames and cultural appeals on behavioral intention?
Chapter 3

Study 1

Study 1 aimed at examining the impact of message framing and cultural appeals in an individualistic society. This chapter details the methodology employed in Study 1 and reports the results of the study.

Based on Hofstede’s (2001) classification of countries’ cultural orientations, the United States was selected to represent an individualistic society. On a 1-100 point Collectivism-Individualism Scale (higher numbers denote greater Individualism), the United States is rated 91 (p. 500).

Method

Participants

149 American participants from communications classes were recruited at a university in the northeastern United States. Data was collected between September and October of 2009 when the season was transitioning from fall to winter.

A small portion of extra credit was given to participants for joining in the study. American participants ranged in age from 19 to 23 years ($M = 20.57$, $SD = .70$) with 90.6% describing themselves as White/Caucasian, 4.0% as Hispanic, 4.0% as multi-racial, 0.7% as Asian, and 0.7% as African-American. About 83.2% of the American participants were females. Over 83.7% of the participants from the United States reported that their family’s household annual income was above $60,000.

Among American participants, 56.8% reported that they never or rarely got flu shots, 23.6% reported getting a flu shot once every few years, whereas 19.6% said they got flu shots
every year. About 46% of the participants revealed that they have had influenza. Around 10% said they had the experience of trying to get a flu shot but it was not available.

Experimental design

Study 1 employed a 2 (Message Frames: Gain, Loss) x 2 (Cultural Appeals: Self, Other) between-subject factorial experimental design in which each participant was randomly assigned to read one of the four designed brochures about influenza and flu shots. Two of the independent variables (i.e. Message Frames and Cultural Appeals) of the study were manipulated in the designed brochures. A control condition was added in addition to the treatment conditions to examine participants’ attitudes and behavioral intention toward getting a flu shot without message intervention. The number of participants in each condition is shown in Table 1.

Table 1. Experimental Conditions (Study 1)

<table>
<thead>
<tr>
<th>Message Frames</th>
<th>Cultural Appeals</th>
<th>Self</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gain</td>
<td></td>
<td>31</td>
<td>31</td>
</tr>
<tr>
<td>Loss</td>
<td></td>
<td>34</td>
<td>30</td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td>23</td>
<td></td>
</tr>
</tbody>
</table>

Stimuli

Four different brochures about influenza and flu shots were designed for this project. The 3-page brochures primarily followed the format of the brochures commonly seen in a university health service. The black-and-white, two-sided brochures were primarily text-based. The outside pages included the information such as the general title: The influenza pandemic: It affects millions of people every year; the contact information and logo of the campus health service; and
availability of flu shots on campus. The outside pages were kept exactly the same across the four brochures. The outside page of the control condition excluded the information of the availability of flu shots but kept all other elements. The manipulation of message frames and cultural appeals were included in the inside pages (see Appendix B).

The headline, a quote from a doctor, the primary content, and the call for action in the brochure all reflected the intended manipulation. The four different brochures used in the treatment conditions were comprised of the following frames: 1) a loss frame with an individualistic appeal (Loss-Self message: Skipping a Flu Shot May Put You at Risk); 2) a loss frame with a collectivistic appeal (Loss-Other message: Skipping a Flu Shot May Put Many at Risk); 3) a gain frame with an individualistic appeal (Gain-Self message: Getting a Flu Shot May Benefit You); and 4) a gain frame with a collectivistic appeal (Gain-Other: Getting a Flu Shot May Benefit Many). Specific wording differences of the manipulated messages used in Study 1 are summarized in Appendix A. The brochures also communicated the risk of influenza and the basic facts about flu shots. These parts remained constant across the four brochures. All other message elements such as font size, font style, color, boldness, paper quality, and design layout were kept the same across all brochures. For the control condition, a health-related brochure contained information about the effect of skipping breakfast. The length of the information presented in the brochure for the control condition was measured by the numbers of words. Length difference was controlled to below 5% of the average length in the treatment conditions. The images of the actual brochures used in study 1 are shown in Appendix B.

Although the collectivistic appeal was labeled as the “other appeal” in this project, the manipulation of the collectivistic appeal did not exclude the concept of “self” in the message. For
example, the title for the gain-other message was designed as “A Flu Shot Can Protect Many.” The word “many” has included the concepts of both self and others. The major difference between the individualistic appeal and the collectivistic appeal lied in the absence of “others” in the individualistic appeal.

Procedure

Participants were invited via email. Data collection was conducted in regular classroom settings. Participants were asked to read an informed consent letter and sign the form if they wanted to participate in the study. Upon their agreement, they were given a pre-message questionnaire that contained the measures of cultural orientations and demographic questions.

Participants were then told that they were invited to read an upcoming brochure for the health service on campus. They were randomly assigned to read one of five brochures (i.e. four brochures for treatment conditions and one brochure for the control condition). Subsequent to reading the brochures, participants were asked to report their thoughts, feelings, and perceptions about the messages. Their attitudes toward the advocated behavior and their behavioral intention were also measured in the post-message questionnaire. Participants were thanked and debriefed when they completed the study. The entire process took approximately 30-40 minutes.

Measures

Pre-message measures. Before the participants read the stimulus materials, they were asked to fill out a pre-message questionnaire that measured people’s cultural orientations and basic demographics. Participants were asked to answer 24 questions in a self-construal scale (i.e. independent or interdependent construal) (Singelis, 1994). In addition, questions about basic
demographics, such as age, gender, ethnicity, and family income were included at the end of the pre-message questionnaire (see Appendix E).

After participants read the stimulus materials, they were asked to complete a questionnaire containing post-message measures (see Appendix F).

*Cognitive responses.* Participants were asked to write down whatever was in their minds right after they read the brochures. A total of 15 American participants’ (10%) cognitive responses were randomly selected for the inter-coder reliability test. And two trained coders independently coded the written cognitive responses using a four-step coding procedure (Dillard, Shen, & Vail, 2007).

First, the coders divided the cognitive thoughts into psychological thought units. The coding for this part was very reliable (Krippendorff’s $\alpha = .98$).

Second, coders were asked to identify and remove the affective responses based on a list of emotion terms identified by Shaver, Schwartz, Kirson, and O’Connor (1978). A thought unit was coded as affective response whenever those words appeared (e.g. surprised, scared, boring, guilty, etc.). Thought units without emotional terms were coded as cognitive responses. The inter-coder reliability for this part was very high (Krippendorff’s $\alpha = 1$).

Third, to eliminate irrelevant thoughts and reduce random noise in the data, coders evaluated whether the thought units were relevant to the message. The coding for this part turned out to be very reliable (Krippendorff’s $\alpha = 1$).

Lastly, the remaining thought units were coded either as (1) favorable thoughts, (2) neutral thoughts, or (3) unfavorable thoughts. Favorable thoughts were defined as responses that demonstrated a positive evaluation of the message, the advocated behavior, the message source,
or a realization of the severity of the advocated health issue (e.g. “I should get a flu shot.” “Message is to the point.”). Unfavorable thoughts were defined as responses demonstrating a negative evaluation of the message, the source, the advocated behavior, or a denial of the severity of the health issue (e.g. “Dull and uncreative brochure.” “No way - Needles!”). Neutral thoughts were defined as responses that did not reflect an assessment of the message, the issue, or the advocated behavior (e.g. “Flu shot is free?”). Some participants wrote single words, which were hard to classify into either favorable thoughts or negative thoughts. Those thoughts were coded as neutral (e.g. “sick”). The reliability for this step was acceptable (Krippendorff’s $\alpha = .84$).

After the reliability test was completed, the author continued to code the rest of the cognitive responses using the same coding scheme. A dominant cognitive response (i.e. cognition) index ($M = .32, SD = 1.97$) was then created by subtracting the number of unfavorable thoughts ($M = 1.02, SD = 1.14$) from the number of favorable thoughts ($M = 1.33, SD = 1.31$). The cognitive responses were not measured in the control condition given that the nature of this measurement was to examine responses to the messages containing influenza and flu shot. Therefore, the measures pertaining to this variable were not included in the control condition.

Perceived severity. Participants were asked to rate their perception about influenza on 10-point semantic differential scales using the following word pairs: not dangerous/very dangerous, not fearful/very fearful, and not a severe health problem/a very severe health problem. Items were summed and averaged to create a new index (Cronbach’s $\alpha = .91$).

Perceived message effectiveness. This variable was measured with four 10-point semantic differential items. The paired words used were not persuasive/very persuasive, not effective/very...
effective, not/very convincing, and not compelling/very compelling (Dillard, Shen & Vail, 2007). The four items were summed and averaged to create a new index (Cronbach’s $\alpha = .93$). The perceived message effectiveness was not measured in the control condition given that the nature of this measure was to examine how people perceive the messages about influenza and flu shots. The control condition did not use such messages. Therefore, the measures pertaining to this variable were not included in the control condition.

**Attitude toward the flu shot.** This variable (i.e. I think getting a flu shot to prevent influenza is…) was measured with five 10-point semantic differential items (Dillard, Shen & Vail, 2007). The word pairs used were: bad/good, unfavorable/favorable, unnecessary/necessary, not beneficial/beneficial, not desirable/desirable. Items were summed and averaged to create a new index (Cronbach’s $\alpha = .90$).

**Behavioral intention.** A set of statements with 10-point Likert-type scales (1 = strongly disagree; 10 = strongly agree) was used to evaluate the likelihood that participants would take the actions that the messages advocated, including: 1) I intend to behave in ways that are consistent with the message; 2) I am going to make an effort to do what the message urged me to do; 3) I plan to act in ways that are compatible with the position promoted by the message. Items were summed and averaged to create a new index (Cronbach’s $\alpha = .96$).

In addition, participants’ affective responses, familiarity with influenza and flu shots, their previous experiences with influenza and flu shots, their perceptions about the cost of flu shots, and their level of processing fluency were measured as potential controlled variables in the post-message questionnaire (see Appendix F for the complete measurement instruments).
Manipulation check

The questions related to the manipulation check were placed at the end of the questionnaire to prevent participants’ possible awareness of the purposive manipulation. To examine the manipulations of loss- versus gain frames, participants were asked to evaluate their perception of the message in two questions “Was the tone in the message you just read mostly negative (1 = not negative at all, 10 = very negative)” and “Was the tone in the message you just read mostly positive? (1 = not positive at all, 10 = very positive).”

To investigate the manipulation of the individualistic or collectivistic appeals, participants were asked to evaluate the messages in two questions “Did the message you just read primarily communicate the effects of (not) getting a flu shot on you as an individual? (1 = no effects on me, 2 = many effects on me), and “Did the message you just read primarily communicate the effects of (not) getting a flu shot on other people? (1 = No effects on others, 10 = many effects on others).

A series of independent sample t-tests indicated that the manipulation was successful. Participants who viewed the loss-framed brochures ($M = 5.73, SD = 2.57$) perceived the messages as significantly more negative than those viewing the gain-framed brochures ($M = 3.82, SD = 1.94$), $t (117) = 4.72, p < .001$. Similarly, participants who were exposed to the gain-framed brochures ($M = 6.69, SD = 1.84$) perceived the message as significantly more positive than those who were exposed to the loss-framed brochure ($M = 4.94, SD = 2.31$), $t (124) = 4.71, p < .001$.

Participants who viewed the individualistic appeal (i.e. self appeal) ($M = 6.71, SD = 1.89$) reported a significantly higher mean when asked whether the message primarily communicated
of the effects of (not) getting a flu shot on you as an individual than did those who viewed the collectivistic appeal (i.e. other appeal) \((M = 5.27, SD = 2.61), t (107) = 3.51, p < .01\). Similarly, those who were exposed to the other appeal \((M = 8.08, SD = 1.72)\) perceived the message as more concentrating on the effects of (not) getting a flu shot on other people than those who read the self appeal \((M = 5.83, SD = 1.58), t (124) = 7.68, p < .001\).

Analysis

The appropriate quantitative methods including MONAVA and ANOVA were used to test proposed H1 and H3, and to answer RQ1. Mediation analyses were used to investigate potential mediators between persuasive messages and behavioral intention. Prior to analyses, the data were examined for normality and outliers. Values for skewness indicated that all univariate data were normally distributed. A multivariate check for dependent variables was conducted to identify any outliers in the data using Mahalanobis’ distance. Analyses showed that all variables were acceptable for univariate and multivariate analyses. The data for the control group were not included in the following MANOVA and ANOVA tests. There is a special section below that reports the comparisons between the control group and other treatment conditions.

Primary Findings

Main effect of message frames

H1 proposed an advantage of gain frames in promoting perceived message effectiveness, attitude toward the flu shot, and behavior intention. H3 proposed an advantage of individualistic appeals to Americans in terms of their persuasive effects. A 2 (Message Frames: Gain vs. Loss) X 2 (Cultural Appeals: Self vs. Other) MONAVA test was employed where perceived message
effectiveness, attitude toward the flu shot, and behavioral intention were dependent variables. The analysis revealed that the main effect of message frames was not significant, Wilks’ Λ = .97, $F (3, 120) = 1.19, p = .32$, partial $\eta^2 = .03$. H1 was not supported. Table 2 summarizes the means and standard errors of the three dependent variables relevant to H1.

**Summary.** In general, the analyses above suggested that gain frames did not demonstrate an advantage in promoting perceived message effectiveness, attitude toward the flu shot, and behavioral intention to get a flu shot compared to the loss frames. The next step of analyses focused on examining the main effect of cultural appeals.

<table>
<thead>
<tr>
<th>Table 2. Main Effect of Message Frames on Perceived Message Effectiveness, Attitude toward the Flu Shot, and Behavioral Intention (Study 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent measures</strong></td>
</tr>
<tr>
<td>Perceived Message Effectiveness</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Attitude toward the Flu Shot</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Behavioral Intention</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Wilks’ Λ = .97, $F (3, 120) = 1.19, p = .32$, partial $\eta^2 = .03$.

**Main effect of cultural appeals**

The multivariate analysis yielded a significant main effect of cultural appeals, Wilks’ Λ = .90, $F (3, 120) = 4.57, p < .01$, partial $\eta^2 = .10$. The next step of analyses involved a set of ANOVA tests that aimed to further examine the main effect on each of the dependent variables.
The results of the analyses demonstrated that cultural appeals did not yield a significant difference on perceived message effectiveness, $F (1, 122) = .96, p = .33$, partial $\eta^2 = .01$. H2A was not supported. No significant main effect of cultural appeals on attitude toward the flu shots was detected, $F (1, 122) = 2.16, p = .12$, partial $\eta^2 = .02$. H2B was not supported.

Finally, the analysis revealed a significant main effect of cultural appeals on behavioral intention, $F (1, 122) = 6.41, p < .05$, partial $\eta^2 = .05$. However, when looking at the mean directions, the author discovered a pattern that was the opposite of what had been predicted. Specifically, pairwise comparison showed that participants who read the other appeal ($M = 5.93$, $SE = .31$) reported a significantly higher mean on their intention to get a flu shot than those who read the self appeal ($M = 4.86$, $SE = .30$). H2C was not supported; and a significant opposite pattern was discovered (see Figure 1).

Summary. In general, an advantage for the other appeal (i.e. collectivistic gain or loss) was discovered in increasing participants’ intention to perform the advocated behavior – to get a flu shot for influenza prevention – when compared to groups that viewed the self appeal (i.e. individualistic gains and loss). The direction was contradictory to H2C. Table 3 summarizes the means and standard errors of the three dependent variables relevant to H2.
$F(1, 124) = 6.37, p < .01$, partial $\eta^2 = .05$.

Figure 1. Main Effect of Cultural Appeals on Behavioral Intention (Study 1)

Table 3. Main Effect of Cultural Appeals on Perceived Message Effectiveness, Attitude toward the Flu Shot, and Behavioral Intention (Study 1)

<table>
<thead>
<tr>
<th>Dependent measures</th>
<th>Cultural Appeals</th>
<th>Cultural Appeals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Self</td>
<td>Other</td>
</tr>
<tr>
<td>Perceived Message Effectiveness</td>
<td>$M$</td>
<td>$6.48_a$</td>
</tr>
<tr>
<td></td>
<td>$SE$</td>
<td>$.24$</td>
</tr>
<tr>
<td>Attitude toward the Flu Shot</td>
<td>$M$</td>
<td>$7.69_a$</td>
</tr>
<tr>
<td></td>
<td>$SE$</td>
<td>$.21$</td>
</tr>
<tr>
<td>Intention</td>
<td>$M$</td>
<td>$4.86_a$</td>
</tr>
<tr>
<td></td>
<td>$SE$</td>
<td>$.30$</td>
</tr>
</tbody>
</table>

Wilks’ $\Lambda = .90$, $F(3, 120) = 4.57, p < .01$, partial $\eta^2 = .10$.

Note. Using Holm’s sequential Bonferroni post hoc comparisons, within rows, means with no lower case subscript in common differ at $p < .05$. 
Interaction effect

RQ1 was aimed at examining a possible interaction between message frames and cultural appeals on perceived message effectiveness, attitude toward the flu shot, and behavior intention.

A 2 (Message Frames: Loss vs. Gain) X 2 (Cultural Appeals: Self vs. Other) MANOVA test was implemented to investigate the proposed research questions. The analysis revealed a significant interaction between message frames and cultural appeals, Wilks’ \( \Lambda = .92, F (3, 120) = 3.67, p < .05, \) partial \( \eta^2 = .09 \). The next step of analyses involved a set of 2 (Message Frames: Loss vs. Gain) X 2 (Cultural Appeals: Self vs. Other) ANOVA tests that aimed at further examining the interaction effect on each of the dependent variables.

Perceived message effectiveness. An ANOVA test revealed a significant Message Frames X Cultural Appeals interaction on the perceived message, \( F (1, 122) = 10.20, p < .01, \) partial \( \eta^2 = .08 \). When the health message was gain-framed, those who read self appeal (\( M = 6.74, SE = .34 \)) perceived the message as significantly more effective than those who viewed the other appeal (\( M = 5.32, SE = .34 \)), \( t (60) = 2.90, p < .01 \). When the other appeal was blended in the message, loss frames (\( M = 6.97, SE = .35 \)) yielded a significantly higher mean on perceived message effectiveness than gain frames (\( M = 5.32, SE = .34 \)) (see Figure 2).
$F(1, 122) = 10.20, p < .01, \text{ partial } \eta^2 = .08.$

*Figure 2. Message Frames X Cultural Appeals Interaction on Perceived Message Effectiveness (Study 1)*

*Attitude.* A significant Message Frames X Cultural Appeals interaction on the attitude toward the flu shot was discovered, $F(1, 122) = 6.36, p < .05, \text{ partial } \eta^2 = .05.$ Specifically, when the health message was loss-framed, those who read the other appeal ($M = 8.53, SE = .30$) reported a significantly more favorable attitude toward getting a flu shot than those who read the self appeal ($M = 7.35, SE = .28$), $t(61) = 2.74, p < .05.$ When the message was gain-framed, cultural appeals did not yield a significant mean difference on the attitude toward getting a flu shot, $t(60) = .79, p = .43$ (see Figure 3).
Figure 3. Message Frames X Cultural Appeals Interaction on Attitude toward the Flu Shot (Study 1)

Behavioral intention. An ANOVA test also revealed a significant Message Frames X Cultural Appeals interaction on behavioral intention, $F (1, 122) = 5.78, p < .05$, partial $\eta^2 = .05$. Specifically, when the health message was loss-framed, those who read the other appeal ($M = 6.49, SE = .44$) reported a significantly higher intention to get a flu shot than those who read the self appeal ($M = 4.39, SE = .41$), $t (62) = 3.56, p < .01$. The result revealed that the persuasive effect of the loss frame largely depended on the variation of the cultural appeals such that the message focusing on the collectivistic loss significantly increased people’s intention to get the flu vaccination.
In order to compare the effects of four different types of messages with the control group, a one-way ANOVA (Message type: Gain-self, Gain-other, Loss-Self, Loss-Other, control) test was performed where the attitude toward the flu shot was the dependent variable. When comparing the attitude toward the flu shot from the control condition to those from each of the four treatment conditions, participants who viewed the loss-other message ($M = 8.53, SE = .31$) reported a significantly more favorable attitude than those in the control condition ($M = 7.30, SE = .35$), $F (4, 144) = 2.62, p < .05$, partial $\eta^2 = .07$. Exposure to the other three types of messages (i.e. loss-self, gain-other, gain-self) did not lead to a more favorable attitude toward the flu shot.

Table 4 summarizes the means and standard errors of the three dependent variables relevant to RQ1 and the comparisons to the control condition.
Table 4. Message Frames X Cultural Appeals Interaction on Perceived Message Effectiveness, Attitude, and Behavioral Intention (Study 1)

<table>
<thead>
<tr>
<th>Dependent measures</th>
<th>Gain</th>
<th>Loss</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Self</td>
<td>Other</td>
<td></td>
</tr>
<tr>
<td>Perceived Message Effectiveness</td>
<td>(M = 6.74_a) (SE = .34)</td>
<td>(5.32_b) (SE = .34)</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>(M = 6.21_{ab}) (SE = .33)</td>
<td>(6.97_a) (SE = .35)</td>
<td>-</td>
</tr>
<tr>
<td>Attitude toward the Flu Shot</td>
<td>(M = 8.03_{ab}) (SE = .31)</td>
<td>(7.72_{ab}) (SE = .31)</td>
<td>(7.35_b) (SE = .28) (SE = .30) (SE = .35)</td>
</tr>
<tr>
<td></td>
<td>(M = 7.35_b) (SE = .28)</td>
<td>(8.53_a) (SE = .30)</td>
<td></td>
</tr>
<tr>
<td>Behavioral Intention</td>
<td>(M = 5.32_{ab}) (SE = .42)</td>
<td>(5.38_{ab}) (SE = .43)</td>
<td>(4.39_b) (SE = .41) (SE = .44) (SE = .44)</td>
</tr>
</tbody>
</table>

*Note.* Using Holm’s sequential Bonferroni post hoc comparisons, within rows, means with no lower case subscript in common differ at \(p < .05\).

**Summary.** In general, a significant interaction of Message Frames and Cultural Appeals was discovered. Specifically, the combination of gain frame and self appeal (i.e. gain-self), and the mixture of the loss frame and the other appeal (i.e. loss-other) had a significant advantage in enhancing the perceived message effectiveness when compared to the gain-other message.

Participants seemed to hold a generally favorable attitude toward the flu shot; the loss-other message was the only message type that could significantly improve the attitude among the four when compared to no exposure to stimulus messages. Additionally, when the message was loss framed, the other appeal yielded a significantly more favorable attitude than the self appeal. Gain-self and loss-other messages also greatly enhanced behavioral intention when compared to the loss-self message.
Mediation Analysis

Besides testing hypotheses and investigating research questions, this study also aimed at looking for potential variables that could mediate the effects on behavioral intention of exposure to health messages. Perceived severity, cognitive response, perceived message effectiveness, and attitude toward the flu shot were proposed as potential mediators between exposure to persuasive communications (i.e. message frames and cultural appeals) and behavioral intention. Given that a significant Message Frames X Cultural Appeals interaction effect was discovered, the supplemental analyses focused primarily on the persuasive effects led by the interaction between two message-related variables. The two message variables were coded as Message Frames: -1=loss, 1=gain; Cultural Appeals: -1=other, 1=self. A new variable “interaction” was created by multiplying the two re-coded variables. The values for interaction then became: 1= gain-self and loss other, -1=loss-self and gain-other. The new variable was named message interaction. Zero-order correlations were performed to determine the interrelationships among the variables included in the mediation analyses (see Table 5).

The second set of analyses employed to investigate mediation were bootstrapping procedures. This procedure (5,000 samples) allowed an examination of multiple mediators in the same model simultaneously as described by Preacher and Hayes (2008).
Table 5. Zero-order Correlations of All Variables for Mediation Analyses (Study 1)

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Message Interaction</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Cognitive Responses</td>
<td>0.19*</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Perceived Severity</td>
<td>0.23*</td>
<td>0.35**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Perceived Message Effectiveness</td>
<td>0.27**</td>
<td>0.46**</td>
<td>0.39**</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Attitude</td>
<td>0.22*</td>
<td>0.52**</td>
<td>0.43**</td>
<td>0.59**</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6. Intention</td>
<td>0.27**</td>
<td>0.45**</td>
<td>0.34**</td>
<td>0.40**</td>
<td>0.56**</td>
<td>1</td>
</tr>
</tbody>
</table>

Figure 5. Bootstrapping Mediation Analysis for Message Interaction, Perceived Severity, Cognitive Response, Attitude, and Behavioral Intention (Study 1)

Note 1. * p < .05, ** p < .01, *** p < .001
Note 2. Numbers were standardized β coefficients.
Note 3. The variable “message interaction” denotes the contrast between gain-self, loss-other messages and gain-other, loss-self messages.
In general, the model illustrated in Figure 5 suggested that message interaction was a significant predictor for perceived message effectiveness ($\beta = .27, p < .01$), perceived severity ($\beta = .23, p < .01$), cognitive response ($\beta = .19, p < .01$), and attitude toward the flu shot ($\beta = .22, p < .01$). Additionally, cognitive responses ($\beta = .20, p < .01$), and attitude toward the flu shot ($\beta = .53, p < .01$), significantly predicted behavioral intention.

Bootstrapping mediation analysis suggested that as a set, perceived message effectiveness, perceived severity, cognitive response, and attitude significantly mediated the effects of message interaction on behavioral intention ($\beta = .46, p < .05$). However, the indirect effect of message interaction was significant only via cognitive response ($\beta = .05, p < .05$), and attitude ($\beta = .25, p < .05$) (see Table 6).

Table 6. Indirect Effects of Message Frames X Cultural Appeals Interaction on Behavioral Intention: Bootstrapping Mediation Analysis (Study 1)

<table>
<thead>
<tr>
<th>Behavioral Intention</th>
<th>Bootstrap estimate</th>
<th>95% Confidence intervals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total indirect effects</td>
<td>.46*</td>
<td>.17</td>
</tr>
<tr>
<td>Indirect effects via Perceived Message Effectiveness</td>
<td>.08</td>
<td>-.06</td>
</tr>
<tr>
<td>Indirect effects via Perceived Severity</td>
<td>.06</td>
<td>-.00</td>
</tr>
<tr>
<td>Indirect effects via Cognitive Response</td>
<td>.05*</td>
<td>.01</td>
</tr>
<tr>
<td>Indirect effects via Attitude</td>
<td>.25*</td>
<td>.08</td>
</tr>
</tbody>
</table>

* $p < .05$

The total indirect effect of the four mediating variables was significant, meaning that those four factors worked together and mediated the effect of message interaction on behavioral intention.
intention. However, the indirect effect of message interaction was only significant via the cognitive responses and attitude toward the flu shot. Perceived message effectiveness and perceived severity were not significant mediators when analyzed with the other two factors in one mediation model.

Results Summary of Study 1

In sum, study 1 has discovered a significant Message Frames X Cultural Appeals interaction effect on perceived message effectiveness, attitude toward the flu shot, and behavioral intention. When the message was gain-framed, self appeal significantly enhanced perceived message effectiveness. It revealed that the message emphasizing individualistic gain was more favored by participants than the one focusing on collectivistic gain. Also, the loss-other message was perceived as more persuasive than the gain-other message. It suggested that the message on collectivistic loss was perceived more appealing than collectivistic gain. The loss-other message that focused on collectivistic loss also greatly enhanced a favorable attitude toward the flu shot and behavioral intention compared with the loss-self message, which emphasized individualistic loss.

Moreover, mediation analyses revealed a set of factors that mediated the direct effect of persuasive messages for behavioral intention, including perceived message effectiveness, cognition, perceived severity, and attitude toward the flu shot. This analysis revealed the advantages of loss-other or gain-self messages in motivating flu vaccination behaviors by changing people’s attitude toward the flu vaccine and cognitive responses.
Chapter 4

Study 2

Study 2 aimed at examining the impact of message framing and cultural appeals in a collectivistic society. This chapter details the methodology employed to test H2a-c, H4a-c and to answer RQ2. This chapter also reports the results of Study 2.

Based on Hofstede’s (2001) classification of countries’ cultural orientations, Hong Kong was selected to represent a collectivistic society. On a 1-100 point Collectivism-Individualism Scale (lower numbers demote greater Collectivism, p. 500), Hong Kong is rated 25. Given that Study 2 was a replication of Study 1, which tested the effects of message frames and cultural appeals in a different society, the following method section only highlights the minor differences between the two studies.

Method

Participants

A total of 144 Hong Kong Chinese participants from communications classes were recruited at a university in Hong Kong. Data was collected between October and December of 2008, when the peak influenza season was approaching in Hong Kong.

A small portion of extra credit was given to participants for joining the study. Hong Kong participants ranged in age from 18 to 29 years ($M = 20.33, SD = 1.43$). About 78% of the Hong Kong participants were females. About 80% of the total reported that they were Hong Kong residents; and the rest came from mainland China. Over 87% of the participants from the Hong Kong study reported that their family’s household annual income was below 400,000 (HKD).
On average, Hong Kong participants have been using English for approximately 13 years ($M = 13.89, SD = 3.86$) but only 1.4% considered English to be their first language. The majority (79.9%) called Cantonese their first language. 18.8% considered Mandarin their first language.

Among Hong Kong participants, 76.8% reported that they never or rarely got flu shots, 15.5% reported getting a flu shot once every few years, whereas 7.7% said they got flu shots every year. 36.8% of the participants revealed that they have had influenza. 2.1% reported that they had been infected with Severe Acute Respiratory Syndrome (SARS). 8.4% said they had the experience of trying to get a flu shot that was not available.

**Experimental design**

Study 2 employed a design similar to Study 1. A 2 (Message Frames: Gain, Loss) x 2 (Cultural Appeals: Self, Other) between-subject factorial experimental design was conducted in which each participant read one of the four specially-designed brochures about influenza and flu shots. Two of the independent variables (i.e. message frames and cultural appeals) of the study were manipulated in the brochures. In addition to the treatment conditions, a control condition was added to examine participants’ attitude and behavioral intention without message intervention (see Table 7). Study 2 followed the same procedure as used in Study 1.
Table 7. Experiment Conditions (Study 2)

<table>
<thead>
<tr>
<th>Message Frames</th>
<th>Cultural Appeals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Self</td>
</tr>
<tr>
<td>Gain</td>
<td>N=28</td>
</tr>
<tr>
<td>Loss</td>
<td>N=30</td>
</tr>
<tr>
<td>Control</td>
<td></td>
</tr>
</tbody>
</table>

**Stimuli**

Study 2 used message manipulation similar to what had been employed in Study 1. Differences included changing the logo of the health service and the contact information to those of the university in Hong Kong where the study was conducted. The doctor’s name was changed to Chris Leung, a commonly-used name in Hong Kong. All other elements of the brochures were kept the same across all five conditions.

**Measures**

*Pre-message measures.* The pre-message questionnaire included all the measures used in Study 1. Some additional questions were added which measured participants’ English proficiency. The question of ethnicity was replaced by asking about participants’ nationality. The currency in the question on household income was changed from US dollars to Hong Kong dollars (see Appendix E).

After reading the stimulus materials, Hong Kong participants were asked to complete a questionnaire containing post-message measures (see Appendix F). Questions on their experiences with SARS were placed at the end of the post-message questionnaire.

*Cognitive responses.* The measure and the coding of the cognitive responses followed the exact same procedure as Study 1. A total of 15 Hong Kong participants’ (i.e. 10% of
participants) cognitive responses were randomly selected for the inter-coder reliability test. Two
tained coders independently coded the written cognitive responses using a four-step coding
procedures (Dillard, Shen, & Vail, 2007).

First, the coders divided the cognitive thoughts into psychological thought units. The
coding for this part was very reliable (Krippendorff’s $\alpha = .97$).

Second, coders were asked to identify and remove the affective responses based on a list
of emotion terms identified by Shaver, Schwartz, Kirson, and O’Connor (1978). A thought unit
was coded as affective response whenever those words appeared (e.g. surprised, scared, boring,
guilty, etc.). Thought units without emotional terms were coded as cognitive responses. The
inter-coder reliability for this part was very high (Krippendorff’s $\alpha = 1$).

Third, to eliminate irrelevant thoughts and reduce random noise in the data, coders
determined whether the thought units were relevant to the message. The coding for this part
turned out to be very reliable (Krippendorff’s $\alpha = 1$).

Lastly, the remaining thought units were coded either as (1) favorable thoughts, (2)
negative thoughts, or (3) unfavorable thoughts. Favorable thoughts were defined as responses that
demonstrated a positive evaluation of the message, the advocated behavior, the message source,
or a realization of the severity of the advocated health issue. (e.g. “Everyone should have a flu
shot.” “Flu can be fatal.”) Unfavorable thoughts were defined as responses demonstrating a
negative evaluation of the message, the source, the advocated behavior, or a denial of the
severity of the health issue. (e.g. “This is exaggeration.” “The brochure can’t convince me.”).
Neutral thoughts were defined as responses that did not reflect an assessment of the message, the
issue, or the advocated behavior (e.g. “Flu shot is free?”). Some participants wrote single words
which were hard to classify into either favorable thoughts or negative thoughts. Those thoughts were coded as neutral (e.g. “sick”). The reliability for this step was acceptable (Krippendorff’s \( \alpha = .82 \)). After the reliability test was completed, the author continued to code the rest of the cognitive responses using the same coding scheme.

A dominant cognitive response (i.e. cognition) index (\( M = .17, SD = 2.35 \)) was then created by subtracting the number of unfavorable thoughts (\( M = 1.09, SD = 1.37 \)) from the number of favorable thoughts (\( M = 1.27, SD = 1.37 \)). The cognitive responses were not measured in the control condition given that the nature of this measure was to examine responses to the messages about influenza and flu shots. The control condition did not use such messages. Therefore, the measures pertaining to this variable were not included in the control condition.

*Perceived severity.* The measure for this variable followed the one used in Study 1. Items were summed and averaged to create a new index (Cronbach’s \( \alpha = .90 \)).

*Perceived message effectiveness.* This variable was measured with the four 10-point semantic differential items used in Study 1. Then items were summed and averaged to create a new index (Cronbach’s \( \alpha = .94 \)). The perceived message effectiveness was not measured in the control condition given that the nature of this measure was to examine how people perceive the messages about influenza and flu shots. The control condition did not use such messages. Therefore, the measures pertaining to this variable were not included in the control condition.

*Attitude toward the flu shot.* This variable (i.e. I think getting a flu shot to prevent influenza is…) was measured with five 10-point semantic differential items (Dillard, Shen, & Vail, 2007). The word pairs used were: *bad/good, unfavorable/favorable.*
unnecessary/necessary, not beneficial/beneficial, not desirable/desirable. Items were summed and averaged to create a new index (Cronbach’s $\alpha = .90$).

**Behavioral intention.** The three statements from Study 1 that measured the behavioral intention were replicated in Study 2. Items were summed and averaged to create a new index (Cronbach’s $\alpha = .96$).

In addition, participants’ affective responses, familiarity with influenza and flu shots, their previous experiences with influenza and flu shots, their perceptions about the cost of flu shots, their level of processing fluency, and their prior experiences with SARS were measured as potential control variables in the post-message questionnaire (see Appendix F for the complete measurement instruments).

**Manipulation check**

The questions related to the manipulation check were placed at the end of the questionnaire to prevent participants’ possible awareness of the purposive manipulation.

A question for checking the manipulation of message frames asked participants to rate on a 10-point-scale statement: *the message I just read primarily communicated ___* ($1 = \text{costs of not getting a flu shot}$, $10 = \text{benefits of getting a flu shot}$). Participants who viewed the gain-framed message ($M = 6.87, SD = 2.46$) reported a significantly higher mean on this question than those who viewed the loss-framed message ($M = 5.72, SD = 2.41$), $t(113) = 2.52, p < .05$.

A question for checking the manipulation of cultural appeals asked participants to rate on a 10-point-scale statement: *the message primarily communicated the effect of flu vaccination on ___* ($1 = \text{me}$, $10 = \text{others}$). Participants who viewed the collectivistic appeal (i.e. other appeal) ($M = 5.79, SD = 2.51$) reported a significantly higher mean on this question than those who
viewed the individualistic appeal (i.e. self appeal) \( M = 4.12, SD = 2.61 \), \( t (114) = 3.69, p < .001 \).

Analysis

The appropriate quantitative methods including MONAVA and ANOVA were used to test proposed H2 and H4, and answer RQ2. Mediation analyses were used to investigate potential mediators between persuasive messages and behavioral intention. Prior to analyses, the data were examined for normality and outliers. Values for skewness indicated that all univariate data were normally distributed. A multivariate check for dependent variables was conducted to identify any outliers in the data using Mahalanobis’ distance. Analyses showed that all variable were acceptable for univariate and multivariate analyses. The data for the control group was not included in the following MANOVA and ANOVA tests. There is a special section below that reports the comparisons between the control group and other treatment conditions.

Primary Findings of Study 2

Main effect of message frames

H2 proposed an advantage of gain frames in promoting perceived message effectiveness, attitude toward the flu shot, and behavior intention in a collectivistic society. H4a-c proposed an advantage of collectivistic appeals to Chinese in terms of their persuasive effects. A 2 (Message Frames: Gain v. Loss) X 2 (Cultural Appeals: Self vs. Other) MONAVA test was employed where perceived message effectiveness, attitude toward the flu shot, and behavioral intention were dependent variables. The analysis revealed that the main effect of message frames was not
significant, Wilks’ $\Lambda = .99$, $F (3, 110) = 1.19$, $p = .90$, partial $\eta^2 = .01$. H2 not supported. Table 8 summarizes the means and standard errors of the three dependent variables relevant to H2.

Table 8. Main Effect of Message Frames on Perceived Message Effectiveness, Attitude toward the Flu Shot, and Behavioral Intention (Study 2)

<table>
<thead>
<tr>
<th>Dependent measures</th>
<th>Message Frames</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Gain</td>
<td>Loss</td>
<td></td>
</tr>
<tr>
<td>Perceived Message Effectiveness</td>
<td>$M$ 5.65</td>
<td>5.62</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$SE$ (.24)</td>
<td>(.26)</td>
<td></td>
</tr>
<tr>
<td>Attitude toward the Flu Shot</td>
<td>$M$ 6.86</td>
<td>6.94</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$SE$ (.21)</td>
<td>(.23)</td>
<td></td>
</tr>
<tr>
<td>Behavioral Intention</td>
<td>$M$ 5.04</td>
<td>5.27</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$SE$ (.25)</td>
<td>(.27)</td>
<td></td>
</tr>
</tbody>
</table>

Wilks’ $\Lambda = .99$, $F (3, 110) = 1.19$, $p = .90$, partial $\eta^2 = .01$.

Summary. In general, the analyses above suggested that gain frames did not demonstrate an advantage in promoting perceived message effectiveness, attitude toward the flu shot, and behavioral intention compared to the loss frames in Hong Kong. The next step of analyses focused on examining the main effect of cultural appeals.

Main effect of cultural appeals

The multivariate analysis did not yield a significant main effect of cultural appeals, Wilks’ $\Lambda = .99$, $F (3, 110) = .18$, $p = .91$, partial $\eta^2 = .01$. H4a, H4b and H4c were not supported. Table 9 summarizes the mean and standard errors of the three dependent variables associated with H4.
Table 9. Main Effect of Cultural Appeals on Perceived Message Effectiveness, Attitude toward the Flu Shot, and Behavioral Intention (Study 2)

<table>
<thead>
<tr>
<th>Dependent measures</th>
<th>Cultural Appeals</th>
<th>Self</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived Message Effectiveness</td>
<td>M</td>
<td>5.59</td>
<td>5.69</td>
</tr>
<tr>
<td></td>
<td>SE</td>
<td>.25</td>
<td>.25</td>
</tr>
<tr>
<td>Attitude toward the Flu Shot</td>
<td>M</td>
<td>6.85</td>
<td>6.96</td>
</tr>
<tr>
<td></td>
<td>SE</td>
<td>.22</td>
<td>.23</td>
</tr>
<tr>
<td>Behavioral Intention</td>
<td>M</td>
<td>5.02</td>
<td>5.30</td>
</tr>
<tr>
<td></td>
<td>SE</td>
<td>.26</td>
<td>.26</td>
</tr>
</tbody>
</table>

Wilks’ $\Lambda = .99$, $F(3, 110) = .18, p = .91$, partial $\eta^2 = .01$.

Summary. In general, an advantage for other appeal (i.e. collectivistic appeal) was not discovered for increasing perceived message effectiveness, attitude toward the flu shot, and Hong Kong participants’ intention to perform the advocated behavior.

Interaction effect

RQ2 was designed to examine a possible interaction between message frames and cultural appeals on perceived message effectiveness, attitude toward the flu shot, and behavior intention in a collectivistic society.

A 2 (Message Frames: Loss vs. Gain) X 2 (Cultural Appeals: Self vs. Other) MANOVA test was implemented to investigate the proposed research question. The analysis revealed a significant interaction between message frames and cultural appeals, Wilks’ $\Lambda = .87$, $F(3, 110) = 5.43, p < .01$, partial $\eta^2 = .13$. The next step of analyses involved a set of 2 (Message Frames: Loss vs. Gain) X 2 (Cultural Appeals: Self vs. Other) univariate analyses of variance (ANOVA) that aimed at further investigating the interaction effect on each of the dependent variables.
Perceived message effectiveness. An ANOVA test revealed a significant Message Frames X Cultural Appeals interaction on perceived message, $F (1, 112) = 10.85, p < .001$, partial $\eta^2 = .09$. When the health message was gain-framed, those who read the self appeal ($M = 6.19, SE = .36$) perceived the message as significantly more effective than those who viewed the other appeal ($M = 5.12, SE = .33$), $t (60) = 2.44, p < .05$. When the message was loss-framed, the other appeal ($M = 6.26, SE = .39$) yielded a significantly higher mean on perceived message effectiveness than the self appeal ($M = 4.99, SE = .35$), $t (52) = 2.22, p < .05$ (see Figure 6).

![Graph showing the interaction effect](image)

$F (1, 112) = 10.85, p < .001$, partial $\eta^2 = .09$.

Figure 6. Message Frames X Cultural Appeals Interaction on Perceived Message Effectiveness (Study 2)

Attitude. A significant Message Frames X Cultural Appeals interaction on attitude toward the flu shot was discovered, $F (1, 112) = 4.58, p < .05$, partial $\eta^2 = .04$. Specifically, when the health message was loss-framed, those who read the other appeal ($M = 7.34, SE = .35$) reported a marginally significant higher mean on attitude toward getting a flu shot than those who read the
self appeal \((M = 6.55, SE = .31), t (52) = 1.74, p = .08\). When the message was gain-framed, the cultural appeals did not yield a significant mean difference on attitude toward the flu shot, \(t (60) = 1.29, p = .20\) (see Figure 7). The analysis revealed the advantages of the loss frame largely depended on the collectivistic value blended in the message.

\[F (1, 112) = 4.58, p < .05, \text{ partial } \eta^2 = .04.\]

*Figure 7. Message Frames X Cultural Appeals Interaction on Attitude toward the Flu Shot (Study 2)*

**Behavioral intention.** An ANOVA test also revealed a significant Message Frames X Cultural Appeals interaction on behavioral intention, \(F (1, 112) = 11.57, p < .01, \text{ partial } \eta^2 = .09\). Specifically, when the health message was loss-framed, those who read the other appeal \((M = 6.04, SE = .40)\) reported significantly a higher intention than those who read the self appeal \((M = 4.51, SE = .36), t (52) = 2.96, p < .01.\) When the health message was gain-framed, the self appeal did not yield a significant higher mean \((M = 5.54, SE = .37)\) on behavioral intention than the
other appeal ($M = 4.39, SE = .43$), $t (60) = 1.88, p = .06$ (see Figure 8). It seemed that the persuasiveness of the loss frame on behavioral intention lied in the collectivistic value blended in the message.

In order to compare the effects of four different types of messages with the control group, a one-way ANOVA (Message type: Gain-self, Gain-other, Loss-Self, Loss-Other, control) test was performed where attitude toward the flu shot was the dependant variable. Overall, attitude toward the flu shot did not differ among the five conditions, $F (4, 139) = 1.49, p = .21$, partial $\eta^2 = .04$. When looking at the pairwise comparisons, the loss-other message ($M = 7.34, SE = .37$)
was the only message type that led to a significantly more favorable attitude toward the flu shot when compared to the control condition ($M = 6.39, SE = 34$).

Table 10 summarizes the means and standard errors of the three dependent variables relevant to RQ2 and the comparisons to the control condition.

Table 10. Message Frames X Cultural Appeals Interaction on Perceived Message Effectiveness, Attitude, and Behavioral Intention (Study 2)

<table>
<thead>
<tr>
<th>Dependent measures</th>
<th>Gain</th>
<th>Loss</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Self</td>
<td>Other</td>
<td>Self</td>
</tr>
<tr>
<td>Perceived Message Effectiveness</td>
<td>$M$</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6.19</td>
<td>5.12</td>
<td>4.99</td>
</tr>
<tr>
<td></td>
<td>($SE$ (.36)</td>
<td>(.33)</td>
<td>(.35)</td>
</tr>
<tr>
<td>Attitude toward the Flu Shot</td>
<td>$M$</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7.14</td>
<td>6.57</td>
<td>6.55</td>
</tr>
<tr>
<td></td>
<td>($SE$ (.32)</td>
<td>(.29)</td>
<td>(.31)</td>
</tr>
<tr>
<td>Behavioral Intention</td>
<td>$M$</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5.54</td>
<td>4.55</td>
<td>4.51</td>
</tr>
<tr>
<td></td>
<td>($SE$ (.37)</td>
<td>(.34)</td>
<td>(.36)</td>
</tr>
</tbody>
</table>

Note. Using Holm’s sequential Bonferroni post hoc comparisons, within rows, means with no lower case subscript in common differ at $p < .05$.

Summary. In general, a significant interaction of message frames and cultural appeals was discovered when the study was conducted in Hong Kong. Specifically, the combination of gain frame and self appeal (i.e. gain-self), and the mixture of the loss frame and the other appeal (i.e. loss-other) had a significant advantage in enhancing the perceived message effectiveness when compared to the loss-self and gain-other messages. Participants seemed to hold a generally favorable attitude toward the flu shot; the loss-other message was the only message type that significantly boosted the attitude among the four when compared with no exposure to stimulus messages. Additionally, when the message was loss-framed, the other appeal yielded
significantly higher behavioral intention than the self appeal. When the message was gain-framed, the self appeal greatly enhanced behavioral intention than the other appeal.

Mediation Analysis

Mediation analyses in Study 2 followed the procedure used in Study 1. RQ3 proposed perceived severity, cognitive response, perceived message effectiveness, and attitude toward the flu shot as potential mediators between exposure to persuasiveness communications (i.e. message frames and cultural appeals) and behavioral intention. Given that Study 2 also revealed a significant Message Frames X Cultural Appeals interaction effect, the mediation analyses focused primarily on the persuasive effects led by the interaction between two message-related variables. The two message variables were coded as Message Frames: -1 = loss, 1 = gain; Cultural Appeals: -1 = other, 1 = self. A new variable was created by multiplying the two re-coded variables. The values for interaction then became: 1= gain-self and loss other, -1 = loss-self and gain-other. The new variable was named Message Interaction. Zero-order correlations were performed to determine the interrelationships among the variables included in the mediation analyses (see Table 11).

Simultaneous mediation

The second set of analyses investigated mediation by using bootstrapping procedures. This procedure (5,000 samples) allowed an examination of multiple mediators in the same model simultaneously, as described by Preacher and Hayes (2008). Perceived message effectiveness, perceived severity, cognitive response, and attitude toward the flu shot were analyzed as potential mediators between message interaction and behavioral intention. The result of this bootstrapping mediation analysis is illustrated in Figure 9.
Table 11. Zero-order Correlations of All Variables for Mediation Analyses (Study 2)

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Message Interaction</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Cognitive Responses</td>
<td>.24</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Perceived Severity</td>
<td>.37**</td>
<td>.21*</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Perceived Message Effectiveness</td>
<td>.30**</td>
<td>.44**</td>
<td>.33**</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Attitude</td>
<td>.20*</td>
<td>.43**</td>
<td>.42**</td>
<td>.68**</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6. Intention</td>
<td>.30**</td>
<td>.41**</td>
<td>.48**</td>
<td>.47**</td>
<td>.54**</td>
<td>1</td>
</tr>
</tbody>
</table>

Figure 9. Mediation Analysis for Message Interaction, Perceived Message Effectiveness, Perceived Severity, Cognitive Response, Attitude, and Behavioral Intention (Study 2)

Note 1. * p < .05, ** p < .01, *** p < .001
Note 2. Numbers were standardized β coefficients.
Note 3. The variable “message interaction” denotes the contrast between gain-self, loss-other messages and gain-other, loss-self messages.
In general, the model illustrated in Figure 9 suggested that message interaction was a significant predictor for perceived message effectiveness ($\beta = .30, p < .01$), perceived severity ($\beta = .37, p < .001$) and attitude toward the flu shot ($\beta = .20, p < .01$). Message interaction didn’t predict cognitive response ($\beta = -.11, p > .05$). Additionally, perceived severity ($\beta = .26, p < .01$), cognitive responses ($\beta = .25, p < .01$), and attitude toward the flu shot ($\beta = .29, p < .05$), significantly predicted behavioral intention.

Bootstrapping analyses also suggested that as a set, these four factors did not mediate the effects of message interaction on behavioral intention ($\beta = .27, p > .05$). The indirect effect of message interaction was significant only via perceived severity ($\beta = .18, p < .05$) and attitude toward the flu shot ($\beta = .11, p < .05$) (see Table 12).

Table 12. Indirect Effects of Message Frames X Cultural Appeals Interaction on Behavioral Intention: Bootstrapping Mediation Analysis (Study 2)

<table>
<thead>
<tr>
<th>Behavioral Intention</th>
<th>Bootstrap estimate</th>
<th>95% Confidence intervals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total indirect effects</td>
<td>.27</td>
<td>-.02 - .59</td>
</tr>
<tr>
<td>Indirect effects via Perceived Message Effectiveness</td>
<td>.04</td>
<td>-.12 - .18</td>
</tr>
<tr>
<td>Indirect effects via Perceived Severity</td>
<td>.18*</td>
<td>.05 - .36</td>
</tr>
<tr>
<td>Indirect effects via Cognitive Response</td>
<td>-.05</td>
<td>-.18 - .02</td>
</tr>
<tr>
<td>Indirect effects via Attitude</td>
<td>.11*</td>
<td>.00 - .32</td>
</tr>
</tbody>
</table>

* $p < .05$
Supplemental analysis

Bootstrapping mediation analysis indicated that perceived message effectiveness, perceived severity, cognitive response, and attitude toward the flu shot did not mediate the effect of message interaction on behavioral intention as a set. As shown in Figure 11, the message interaction did not predict the presumed mediating variables – cognitive response ($\beta = -.11$, $p > .05$). Therefore, cognitive response should not be considered as a mediator and should be dropped from the mediation model in Study 2.

When searching for the potential reasons why cognitive response was a mediator in Study 1 but not in Study 2, the author found that only 1.4% of Hong Kong participants reported English as their first language. Therefore, when reading the designed English-language persuasive messages, it was less likely that Hong Kong participants could engage in deep thinking. Instead, “feeling right” (i.e. processing fluency) about the message might influence people’s attitudes and judgments (Lee & Aaker, 2004).

Processing fluency in Study 2 was measured with the following two items “I could follow the message smoothly” and “I felt the message was easy to understand.” (Cronbach’s $\alpha = .80$). Items were summed and averaged to create a new index. Then the author did another bootstrapping mediation analysis where message interaction was the independent variable and behavioral intention was the dependent variable. Perceived message effectiveness, perceived severity, process fluency, and attitude toward the flu shot were analyzed as mediators. The result of this analysis is illustrated in Figure 10.

In general, the model illustrated in Figure 10 suggested that message interaction was a significant predictor for perceived message effectiveness ($\beta = .30$, $p < .01$), perceived severity ($\beta$
= .37, \( p < .001 \), processing fluency (\( \beta = .33, \ p < .001 \)), and attitude toward the flu shot (\( \beta = .20, \ p < .01 \)). Additionally, perceived severity (\( \beta = .21, \ p < .01 \)), processing fluency (\( \beta = .27, \ p < .01 \)), and attitude toward the flu shot (\( \beta = .38, \ p < .001 \)), significantly predicted behavioral intention.

![Diagram](image-url)

*Figure 10. Mediation Analysis for Message Interaction, Perceived Severity, Processing Fluency, Perceived Message Effectiveness, Attitude, and Behavioral Intention (Study 2)*

*Note 1.* \( * p < .05, ** p < .01, *** p < .001 \)
*Note 2.* Numbers were standardized \( \beta \) coefficients.
*Note 3.* The variable “message interaction” denotes the contrast between gain-self, loss-other messages and gain-other, loss-self messages.

Bootstrapping mediation analysis also suggested that as a set, perceived message effectiveness, perceived severity, processing fluency, and attitude toward the flu shot significantly mediated the effects of message interaction on behavioral intention (\( \beta = .54, \ p < .05 \)). However, the indirect effect of message interaction was significant only via perceived severity, (\( \beta = .15, \ p < .05 \)), processing fluency (\( \beta = .17, \ p < .05 \)), and attitude toward the flu shot (\( \beta = .14, \ p < .05 \)) (see Table 13).
In sum, the total indirect effect of the four mediating variables was significant, meaning that those four factors worked together and mediated the effect of message interaction on behavioral intention. However, the indirect effect of message interaction was only significant via perceived severity, processing fluency, and attitude toward the flu shot. Perceived message effectiveness was not a significant mediator when it was analyzed with the other three factors in one mediation model.

Table 13. Indirect Effects of Message Frames X Cultural Appeals Interaction on Behavioral Intention: Bootstrapping Mediation Analysis (Study 1)

<table>
<thead>
<tr>
<th>Behavioral Intention</th>
<th>Bootstrap estimate</th>
<th>95% Confidence intervals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total indirect effects</td>
<td>.54*</td>
<td>.24  .87</td>
</tr>
<tr>
<td>Indirect effects via Perceived Message Effectiveness</td>
<td>.07</td>
<td>-.05  .24</td>
</tr>
<tr>
<td>Indirect effects via Perceived Severity</td>
<td>.15*</td>
<td>.03  .33</td>
</tr>
<tr>
<td>Indirect effects via Processing Fluency</td>
<td>.17*</td>
<td>.06  .34</td>
</tr>
<tr>
<td>Indirect effects via Attitude</td>
<td>.14*</td>
<td>.02  .38</td>
</tr>
</tbody>
</table>

* p < .05

Results Summary of Study 2

In sum, similar to Study 1, Study 2 has discovered a significant Message Frames X Cultural Appeals interaction effect on perceived message effectiveness, attitude toward the flu shot, and behavioral intention. When the message was gain-framed, self appeal significantly enhanced perceived message effectiveness and behavioral intention. When the message was loss-framed, the other appeal significantly increased perceived message effectiveness and behavioral intention. The loss-other message that focused on collectivistic loss also greatly enhanced a
favorable attitude toward the flu shot and behavioral intention compared with the control group (see Table 10).

Moreover, mediation analyses revealed a set of factors that mediated the direct effect of persuasive messages for behavioral intention including perceived message effectiveness, perceived severity, processing fluency, and attitude toward the flu shot. This analysis revealed that the advantages of loss-other or gain-self messages in motivating flu vaccination behaviors depended on whether the message could be perceived as effective, or be processed easily, as well as whether the message could change people’s perceptions about the disease, and their attitude toward the behavior.
Chapter 5
Discussion

Theoretical and Practical Implications

Revisiting message framing theory

As applied to health communication, the phrase “message framing” was specifically conceptualized as the gains of compliance and the losses of non-compliance. Specifically, gains refer to the benefits or desirable outcomes of performing a health behavior, and losses refer to the cost or undesirable outcomes of not performing a health behavior (O’Keefe & Jensen, 2006; Rothman et al., 2006; Rothman & Salovey, 1997). However, the traditional operationalization of message framing emphasizes the gains or losses exclusively to oneself. For example, Meyerowitz and Chaiken (1987, p. 504) used the gain-framed message “you can gain several potential health benefits by spending 5 minutes each month doing BSE.” Conversely, the loss-framed message was “you can lose several potential health benefits by failing to spend only 5 minutes each month doing BSE.” In another example, Apanovitch et al. (2003, p. 62) operationalized the gain-framed message as “If you decide to get HIV tested, you may feel less anxious because you would not wonder if you are ill.” And the loss-framed message was designed as “If you decide not to get HIV tested, you may feel more anxious because you may wonder if you are ill.” It was clear that, traditionally, the influence of doing or not doing the advocated behavior has always been on you.

The current study added another factor, the cultural appeals, to the conventional gain-versus-loss operationalization of message framing. Specifically, the gains associated with carrying out a health behavior could either apply to oneself, or to many people. Similarly, the
losses of not carrying out a health behavior could either affect oneself or many people. For many infectious diseases such as influenza, STDs, and Hepatitis B, the early prevention behavior could benefit not only the person who takes the steps to prevent the disease but also those who live around that person; it could also harm not only one person, but many. From a cultural psychology perspective, this could be conceptualized as individualistic gains and losses; or collectivistic gains and losses (Han & Shavitt, 1994; Zhang & Gelb, 1996). This project conducted two separate 2 (Message Frames: Gain, Loss) X 2 (Cultural Appeals: Self, Other) between-subject factorial experimental studies in the United States and in Hong Kong. In both studies, participants were exposed to one of four designed brochures that communicated the risk of influenza and the collectivistic or individualistic benefits or losses of getting a flu shot. The result of this project indicated that the combination of cultural appeals and message frames may be an important extension of the previous research on message framing and health promotion.

Specifically, the results of this study suggest that messages emphasizing individualistic gains and collectivistic losses have advantages in motivating prevention behaviors for an infectious disease – influenza. People were more likely to perform the behavior advocated by the message when they saw that the message contained the gains of compliance for oneself (i.e. individualistic gain), or messages with the losses of non-compliance for many (i.e. collectivistic loss) compared to the losses of non-compliance for oneself and gains of compliance for many. This pattern was discovered, consistently, in both the United States (Study 1) and Hong Kong (Study 2).

These findings were conceptually consistent with the message framing hypotheses. Message framing theory predicts that gain-framed messages will be more persuasive than loss-
framed messages for prevention behaviors; and loss-framed messages will be more persuasive than gain-framed message for detection behaviors (Rothman et al., 2006; Rothman & Salovey, 1997). Given that prior research operationalized message frames in terms of the gains of losses exclusively on you (see Rothman et al., 2006 for a review, p. 204), the gain-self or loss-self messages used in this project were conceptually similar to the traditional manipulation of message frames. As such, the advantage of the gain-self message for motivating preventive behavior intention discovered in both Study 1 and Study 2 is consistent with the prediction of message framing theory (Rothman et al., 2006; Rothman & Salovey, 1997). Given the empirical evidence manifested in this paper, we have provided further support for the notion that the message focusing on gains of compliance, especially on oneself; can successfully promote the preventive behavioral intention. Messages emphasizing individualistic benefits have shown greater persuasive effects than those with individualistic losses.

The influence of culture

Another important goal of this project was to examine the influence of culture on communicating health risks. The interaction between message frames and cultural appeals revealed in this project had not been investigated in previous research associated with health communication. But a very similar pattern was reported in some cultural psychology studies. For example, Aaker and Lee (2001) suggested that when the independent self-view is more accessible, people are more oriented toward a promotion goal and more persuaded by the promotion appeal; when the interdependent self-view is more accessible people are more oriented toward a prevention goal and more persuaded by the prevention appeal. In other words, the salience of independent self-view (i.e. I, me, myself) can enhance the goal of seeking
pleasure and benefits, and the salience of interdependent self-view (i.e. my friends, my family, people around me) can heighten the goal of avoiding losses and pain (Aaker & Lee, 2001).

Conceptually, the manipulation of promotion appeal is highly compatible with the gain-framed message, both of which focus on desirable outcomes. The manipulation of prevention appeal is highly compatible with the loss-framed message, both of which emphasized undesirable outcomes (Aaker & Lee, 2001; Lee, et al., 2000). Therefore, the persuasive effect of the gain-self message discovered in this project could possibly be interpreted as a result of a match of the self appeal (i.e. independent self-view appeal) and the promotion message (i.e. seeking potential benefits). On the other hand, the persuasive effect of the loss-other message discovered in this project could also be interpreted as a result of a match of the other appeal (i.e. interdependent self-view appeal) and the prevention message (i.e. avoid potential pain).

Based on cultural psychology literature, I had hypothesized that people from an individualistic society would be more persuaded by the self appeal, and people from a collectivistic society would be more persuaded by the other appeal (Han & Shavitt, 1994; Zhang & Gelb, 1996). The results from Study 1 and Study 2 did not support this premise; instead, an interaction between message frames and cultural appeals was discovered. To seek the reasons why the fit or non-fit of cultural appeals and people’s chronic cultural orientations did not yield different responses, I first did a check on whether Americans and Hong Kong Chinese held different cultural orientations before they were exposed to the stimulus materials. An independent sample t-test indicated that Americans ($M = 7.16, SD = 1.16$) hold more independent views than Hong Kong Chinese ($M = 6.28, SD = .98$), $t(238) = 6.24, p < .001$. This analysis revealed that, naturally, the individualistic views are more salient for Americans than for...
Hong Kong Chinese. However, Americans ($M = 6.42, SD = 1.14$) and Hong Kong Chinese ($M = 6.61, SD = .88$) did not differ on the collectivistic views, $t (239) = 1.42, p = .16$. This analysis suggested that, naturally, American and Hong Kong participants hold a similar level of the collectivistic view. These results might explain why the other appeal did not yield a greater persuasiveness effect for Hong Kong participants.

In addition, cultural psychology scholars have suggested that chronic cultural orientation could be “activated or suppressed temporarily by contextual cues” and cultural beliefs are “relatively dynamic rather than static (Aaker & Lee, 2001, p. 46).” In other words, individualists and collectivists can both hold independent and interdependent self-views and those views could be temporarily primed by situational factors (Aaker & Lee, 2001). Therefore, another possible explanation could be that the exposure to self appeal or other appeal had temporarily activated people’s independent self-view or interdependent self-view, which temporarily suppressed people’s chronic cultural orientation. However, this speculation needs to be tested in future research.

**Mediating mechanism**

Besides investigating the impact of message frames and cultural appeals on people’s attitudinal and behavioral responses toward the issue of influenza and flu shots, another purpose of the project was to understand the underlying mechanism of how exposure to persuasive messages could change behavioral intention. The mediation analyses have demonstrated different results in the studies in the United States and in Hong Kong.

Study 1, which was conducted in the United States, discovered a significant mediating role of cognitive responses and attitude toward the flu shot. Specifically, for Americans, gain-self
and loss-other appeals promoted behavioral intention through changing people’s cognitive perceptions of the issue and their attitudes toward the behavior. This finding is consistent with the premise that the health information can influence behavioral change only if it is “integrated into a person’s cognitive representation of the issue” (Rothman & Salovey, 1997). Study 1 provided evidence that people’s cognitive efforts in processing the messages are an important mediator for the persuasive effect of the combination of message frame and cultural appeals.

In addition, Study 1 also discovered that for Americans, the interaction between message frames and cultural appeals (i.e. the combination of individualistic gain and collectivistic loss) greatly enhanced perceived message effectiveness and perceived severity, but these two factors did not predict behavioral intention. This finding did not support the argument that perceived message effectiveness is an important indicator of actual persuasion (Dillard, et al., 2007). Moreover, the findings in Study 1 did not reveal that perceived severity could predict behavioral intention, which did not support the premise that increasing the perceived severity of the disease could lead to behavioral change (Allard, 1989; Glanz, et al., 2002; Montgomery, et al., 1989).

In sum, for Americans, the gain-self and loss-other messages can motivate behavioral intention to get a flu shot only if the message can change people’s cognitive thoughts about influenza and flu shots, and also promote a more favorable attitude toward the flu shot.

Study 2, which was conducted in Hong Kong, demonstrated slightly different mediating mechanisms. Specifically, the cognitive responses were not a mediator for the interaction effect of message frames and cultural appeals on behavioral intention. The mediation analysis demonstrated that perceived severity, processing fluency and attitude toward the flu shot were significant mediators. This result revealed that the gain-self and loss-other messages can enhance
behavioral intention only if the messages can make people feel that influenza is a severe health problem, drives people to think that flu shot is an effective way to prevent influenza, and also allows people to process the information fluently. Perceived message effectiveness was significantly predicted by the interaction of message frame and cultural appeals but it did not predict behavioral intention. Moreover, the findings in Study 2 revealed that perceived severity could predict behavioral intention, which supported the premise that increasing the perceived severity of the disease could lead to behavioral change (Allard, 1989; Glanz, et al., 2002; Montgomery et al., 1989).

A comparison of the mediation models of the two studies (see Figure 8 and Figure 10) revealed that the major difference was in the role of cognitive responses in mediating the persuasive effect of the combination of message frames and cultural appeals. For Americans, cognitive responses significantly mediated the persuasive effect of the message frames and cultural appeals, but for Hong Kong Chinese, the cognitive responses were not a mediator. Instead, processing fluency was discovered to be a mediator between the persuasive message and behavioral intention.

The different mediation models discovered in the United States and in Hong Kong could result in different processing strategies employed by individuals from different cultures. Many scholars have suggested that persuasive messages could be processed either systematically or heuristically (Chaiken, Liberman, & Eagly, 1989; Rothman & Salovey, 1997; Petty & Cacioppo, 1986). When messages are systematically processed, people are more involved and pay more attention to “the particular details of the messages” (Rothman & Salovey, 1997, p. 14). When
messages are heuristically processed, people are less involved and pay more attention to “surface features of the message” (Rothman & Salovey, 1997, p. 14).

Given that cognitive responses were not a mediator in Study 2 and processing fluency was a mediator for the persuasive effect of the message frames and cultural appeals, we may speculate that the advantage of gain-self and loss-other messages in motivating behavioral intention resulted from a more heuristic message-processing route. When Hong Kong Chinese were exposed to the persuasive messages, not much cognitive processing was involved; instead, their behavior intention was promoted only when they felt they could follow the message smoothly. In Study 1, however, cognitive thoughts generated by the combination of message frames and cultural appeals greatly enhanced behavioral intention. Therefore, we may speculate that when Americans were exposed to the persuasive messages, their behavior intention was enhanced after they generated more favorable thoughts about the issue.

In sum, the different mediation patterns discovered in the two studies might suggest that Americans have processed the messages more systematically, whereas Hong Kong Chinese have processed the messages more heuristically.

Practical implications

The ultimate goal of this project is to seek an effective strategy to communicate the risks of influenza and drive people to get a flu vaccination. One of the reasons people do not get flu vaccinations is that they do not regard influenza as a severe health problem (WHO, 2009). This study found that the gain-self and loss-other messages could promote perceived severity, and in turn, influence behavioral decisions. This pattern was more salient in Hong Kong.
This project also provided evidence suggesting that for infectious diseases like influenza, people were more responsive to messages that either emphasized collectivistic losses – many could suffer if one person fails to prevent the disease; or focused on individualistic gains – one could benefit from his/her own preventive action. This pattern was found regardless of people’s cultural orientations. Therefore, it could be used in both individualistic and collectivistic societies.

People’s attitude toward the flu vaccination was found to be a significant predictor in both societies, meaning that the long-term campaign of publicizing the general knowledge of flu vaccination is necessary and important. People need to believe that the flu vaccination is helpful and effective before they will decide to get vaccinated.

This study may be useful for public health practitioners to communicate the risk of infectious diseases like influenza. It seemed that messages emphasizing individual gains and collective losses could effectively increase the intention to prevent influenza. This result is consistent with previous studies about other infectious diseases such as using condom to prevent STDs (Kiene et al., 2005). Kiene et al. (2005) found that the gain-framed message focusing on protecting oneself and loss-framed message focusing on protecting oneself and his/her partner were more persuasive and convincing than other types of messages. Therefore, campaigns for infectious diseases should consider these strategies when the primary goal is to promote preventive behaviors.

Limitations and Directions for Future Research

This project is subject to a number of limitations. First, although Hong Kong Chinese were required to use English at school, over 98% reported that their first language was not
English. Using English-based stimuli may create a natural barrier for in-depth processing. Therefore, any future study should use Chinese stimuli in Hong Kong to ease the potential language barriers.

Second, this project used Hofstede’s (2001) classifications to select the United States and Hong Kong as representations of individualistic and collectivistic societies. However, we found that Americans hold more independent self-views than Hong Kong Chinese. But they did not have less interdependent self-views than Hong Kong Chinese. In other words, the Americans and Hong Kong Chinese recruited in this study were similar in terms of their collectivistic orientations. Future studies should consider using participants from other collectivistic societies to further test the persuasive effectiveness of cultural appeals on communication health risks.

Third, this project only measured behavioral intention as an indicator of the actual persuasive effect. Whether people would move from thinking about doing it something to actually perform the advocated behavior remains unknown. Future research should do a follow-up survey within a few weeks after people are exposed to the persuasive messages to observe whether people actually get vaccinated.

Moreover, future studies should examine whether exposure to the cultural appeals could temporarily prime people’s cultural orientation. In other words, would people become more collectivism-oriented after reading collectivistic appeal, or would they become more individualism-oriented after reading an individualistic appeal? This speculation should be further tested empirically.

Finally, influenza is considered a more threatening problem for seniors and people with chronic health problems. Instead of sampling from college students, a future study could extend
this investigation to people who are more vulnerable to influenza. Moreover, this study only used text-based stimuli. Given the fact that most of the current health promotion campaigns tend to integrate multi-media presentations, future research could use audio, video and Web-based stimuli to deliver persuasive messages containing message frames and cultural appeals.

Summary

The results of the two studies showed that exposure to gain-self and loss-other frames could heighten people’s intention to get a flu vaccination. The significant interaction between message frames and cultural appeals indicated that the effect of message framing in motivating preventive behaviors could be moderated by the cultural values embedded in the messages. Messages focusing on individualistic gains and collectivistic losses successfully increased people’s intention to get a flu vaccination.

Moreover, the study in the United States found that the behavioral intention generated by the gain-self and loss-other messages were mediated by a set of variables including perceived message effectiveness, perceived severity, cognitive responses, and attitude toward the flu shot. Among these four factors, the indirect effect through cognitive responses and attitude toward the flu shot were significant. Therefore, we can conclude that for Americans, in order to promote preventive behaviors against influenza, the messages should be able to generate more favorable thoughts and attitudes toward the behavior.

The study in Hong Kong revealed that the behavioral intention driven by the gain-self and loss-other messages was mediated by perceived severity, processing fluency, perceived message effectiveness, and attitude toward the flu shot. Among the four factors, the indirect effects through perceived severity, processing fluency, and perceived message effectiveness were
significant. Therefore, we can conclude that the advantage of the gain-self and loss-other messages in promoting preventive behavior against influenza lies in making people believe that influenza is a severe health problem, and enhancing their favorable attitude toward the flu vaccination. Additionally, behavioral intention can be motivated only if people are able to process the message smoothly. It is the author’s hope that this project can provide more empirical evidence to advance the understanding of how we can communicate the risk of influenza more strategically and efficiently.
References


### Appendix A

#### Summary of Wording Differences in Stimuli (Study 1)

<table>
<thead>
<tr>
<th>Message</th>
<th>Headline</th>
<th>Quotes</th>
<th>Content</th>
<th>Call for Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loss-Other</td>
<td>Skipping A Flu Shot Can Put Many At Risk</td>
<td>“Not getting a flu shot puts the people around you at risk because you may spread the viruses to them. As a result, it increases their risk of getting influenza.” – Chris Myers, M.D.</td>
<td>If you don’t get a flu shot, you may: make others vulnerable to influenza viruses; cause others to suffer from severe headaches, coughs, fevers, and muscle pains; cause the interruption of others’ academic and personal lives; cause others to face a less healthy, less happy, and more difficult life during the flu season.</td>
<td>Get a flu shot, for the sake of others who live and study around you!</td>
</tr>
<tr>
<td>Gain-Other</td>
<td>A Flu Shot Can Protect Many</td>
<td>“Getting a flu shot protects people around you by stopping the spread of influenza viruses. As a result, it benefits them by reducing their risk of getting influenza.” – Chris Myers, M.D.</td>
<td>If you get a flu shot, you may: stop the spread of the influenza viruses; keep others free from severe headaches, coughs, fevers, and muscle pains; allow others to enjoy uninterrupted academic and personal lives; help others enjoy a happier, easier, and healthier life during the flu season.</td>
<td>Get a flu shot, for the sake of others who live and study around you!</td>
</tr>
<tr>
<td>Gain-Self</td>
<td>A Flu Shot Can Protect You</td>
<td>“Getting a flu shot protects you from getting infected with influenza viruses. As a result, it benefits you by reducing your risk of getting influenza.” – Chris Myers, M.D.</td>
<td>If you get a flu shot, you may: get an effective shield for influenza viruses; be free from severe headaches, coughs, fevers, and muscle pains; have an uninterrupted academic and personal life; enjoy a happier, easier, and healthier life during the flu season.</td>
<td>Get a flu shot, for the sake of your own health!</td>
</tr>
<tr>
<td>Loss-Self</td>
<td>Skipping A Flu Shot Can Put You At Risk</td>
<td>“Not getting a flu shot puts you at risk for getting infected with influenza viruses. As a result, it increases your risk of getting influenza.” – Chris Myers, M.D.</td>
<td>If you don’t get a flu shot, you may: become more vulnerable to influenza viruses; suffer from severe headaches, coughs, fevers, and muscle pains; struggle with an interrupted academic and personal life; face a less healthy, less happy, and more difficult life during the flu season.</td>
<td>Get a flu shot, for the sake of your own health!</td>
</tr>
</tbody>
</table>
Appendix B
Images of Stimuli Used in Study 1

Condition 1 (Study 1): Loss-other brochure -- inside and outside pages

Skipping A Flu Shot Can Put Many At Risk

What is Influenza?
The word “influenza” describes a family of viral infections that kills between 250,000 and 400,000 people each year. The disease is quickly transmitted from person to person from sneeze, cough, and personal contact. The risk of getting influenza is always high in a nursery, environment where contact and as many different people is inevitable.

“No getting a flu shot puts the people around you at risk because you may spread the viruses to them. As a result, it increases their risk of getting influenza.”
—Chris Myers, M.D.

Costs of Not Getting A Flu Shot
If you don’t get a flu shot, you may —

○ make others vulnerable to influenza viruses.
○ cause others to suffer from severe headaches, coughing, fever, and muscle pains.
○ cause the interruption of others’ academic and personal lives.
○ cause others to face less healthy, less happy, and more difficult life during the flu season.

A Safe and Effective Vaccine

○ The flu shot is the best child available for influenza for far.
○ The flu vaccine stops effective by changing every year based on international surveillance about which type and strain of viruses will circulate in a given year.
○ One cannot get influenza from a flu vaccine.

Get a flu shot, for the sake of others who live and study around you!

Flu shots are FREE to all Penn State students, staff and faculty ($15 for others.)

○ Flu shots are available at many on-campus clinics on campus. Check the web for schedule. http://www.psu.edu/psu/health/influenza嬴.htm

Appointment:
To schedule an exam appointment, call 814-865-8800

The Influenza Pandemic
3. Distribution of people every year.
Condition 2 (Study 1): Gain-other brochure -- inside and outside pages

A Flu Shot Can Protect Many

What is Influenza?
The word "influenza" describes a family of viral infections that kill between 250,000 and 500,000 people each year. The disease is easily transmitted from person to person from coughs, sneezes, and personal contact. The risk of getting influenza is steeply higher in a crowded environment where hundreds of people are in close contact.

"Getting a flu shot protects people around you by stopping the spread of influenza viruses. As a result, it benefits them by reducing their risk of getting influenza."
—Chris Myers, M.D.

Benefits of Getting A Flu Shot
If you get a flu shot, you may —
○ stop the spread of influenza viruses.
○ keep others free from severe headaches, coughs, fever, and muscle pains.
○ allow others to enjoy uninterrupted academic and personal lives.
○ help others enjoy a happier, warmer, and healthier life during the flu season.

A Safe and Effective Vaccine
○ The flu shot is safe and the first should available for influenza in fall.
○ The vaccine may exhibit by changing every year based on international surveillance data which types and strains of viruses will circulate in a given year.
○ You cannot get influenza from a flu vaccine.

Get a flu shot, for the sake of others who live and study around you!

Flu shots are FREE to all Penn State students, staff, and faculty ($20 for others.)
○ Flu shots are available at many immunization clinics on campus. Check the web site locations, http://www.psu.edu/healthservices/immunizations.cfm

Appointment:
To schedule an on-clinic appointment call: 314-653-8900
A Flu Shot Can Protect You

What is Influenza?
The term “influenza” describes a family of viral infections that kills between 50,000 and 100,000 people each year. The disease is easily transmitted from person to person, from coughs, sneezes, and personal contact. The risk of getting influenza is always high in a community environment where contact with as many different people is inevitable.

“Getting a flu shot protects you from getting infected with influenza viruses. As a result, it benefits you by reducing your risk of getting influenza.”

—Chris Myers, M.D.

Benefits of Getting A Flu Shot
If you had a flu shot, you may —

○ get an effective shield for influenza viruses.

○ be free from severe headaches, coughs, fevers, and muscle pains.

○ have an uninterrupted academic and personal life.

○ enjoy a happier, easier, and healthier life during the flu season.

A Safe and Effective Vaccine

○ The flu shot is safe and the best shield available for influenza to date.

○ The vaccine may be effective by changing over a broad range of international correlations about which types and strains of influenza virus will circulate in a given year.

○ One cannot get influenza from a flu vaccine.

Get a flu shot, for the sake of your own health.

Flu shots are FREE to all Penn State students, staff, and faculty ($15 fee otherwise).

○ Flu shots are available at many immunization sites on campus. Check the web for schedule: http://www.personaluc/healthservices/immunizations.do

Appointment:
To schedule or cancel appointment (514-504-9000).

The Influenza Pandemic
Influenza strikes people every year.
Condition 4 (Study 1): Loss-self brochure -- inside and outside pages

Skipping A Flu Shot Can Put You At Risk

What is influenza?

The word “influenza” describes a family of viral infections that kills between 200,000 and 500,000 people each year. The disease is quickly transmitted from person to person from coughs, sneezes, and personal contact. The risk of getting influenza is always high in a university environment where contact with so many different people is inevitable.

“Not getting a flu shot puts you at risk for getting infected with influenza viruses. As a result, it increases your risk of getting influenza.”

—Chris Myers, M.D.

Costs of Not Getting A Flu Shot

If you don’t get a flu shot, you may —

* become vulnerable to influenza viruses.
* suffer from severe headaches, coughs, fever, and muscle pains.
* struggle with an interrupted academic and personal life.
* face a less healthy, less happy, and more difficult life during the flu season.

A Safe and Effective Vaccine

* The flu shot is the best shield available for influenza so far.
* The flu vaccine stops effectively by changing every year based on international surveillance about which types and strains of viruses will circulate in a given year.
* One cannot get influenza from a flu vaccine.

Get a flu shot, for the sake of your own health!

Flu shots are FREE to all Penn State students, staff and faculty: ($2 for others.)

* Flu shots are available at many immunization clinics on campus. Check the web for schedule: https://www.psu.edu/dept/pennstate/immunizations.cfm

Appointment:
To schedule or cancel appointments call 814-865-1000

The Influenza Pandemic

1 out of 10,000 people die.
Control Condition (Study 1): inside and outside pages

Skipping Breakfast, and Packing on the Pounds

**Start the Day Right**

- Study shows that children who eat breakfast do better in school. It doesn’t take much further thought to realize adults still perform better at work as well. Eating a good breakfast sets the tone for the rest of the day.

- When you skip breakfast, you are likely to become tired when your brain and body run on fuel. By mid-morning, you might grab a cup of coffee or snack on sugary candy bars to wake up again. This might work for a few minutes, but by lunch time you are hungry, cranky, and perhaps your mood might make you a little more prone to make unhealthy choices at lunch.

**Good for Weight Loss**

- Skipping breakfast is a common strategy for losing weight, but not a smart one.

- Many people believe that they will lose weight if they skip meals, but that just isn’t true; the body expects to be refueled a few times each day - starting with breakfast.

- Eating breakfast is good for weight loss. People who eat breakfast are more likely to maintain a healthy weight.

**Making a Healthy Breakfast**

- A healthy breakfast should contain both protein and fiber.

- Protein can come from low-fat meats, eggs, or beans.

- Fiber can be found in whole grains, vegetables, and fruits.

- Cereals, pancakes, and juice are all smart choices for breakfast.

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**Eat More, Weigh Less!**

For more information about nutrition, please go to http://www.us.gov.edu/what/
## Appendix C
Summary of Wording Differences in Stimuli (Study 2)

<table>
<thead>
<tr>
<th>Message</th>
<th>Headline</th>
<th>Quotes</th>
<th>Content</th>
<th>Call for Action</th>
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<tr>
<td>Loss-Other</td>
<td>Skipping A Flu Shot Can Put Many At Risk</td>
<td>“Not getting a flu shot puts the people around you at risk because you may spread the viruses to them. As a result, it increases their risk of getting influenza.” – Chris Leung, M.D.</td>
<td>If you don’t get a flu shot, you may: make others vulnerable to influenza viruses; cause others to suffer from severe headaches, coughs, fevers, and muscle pains; cause the interruption of others’ academic and personal lives; cause others to face a less healthy, less happy, and more difficult life during the flu season.</td>
<td>Get a flu shot, for the sake of others who live and study around you!</td>
</tr>
<tr>
<td>Gain-Other</td>
<td>A Flu Shot Can Protect Many</td>
<td>“Getting a flu shot protects people around you by stopping the spread of influenza viruses. As a result, it benefits them by reducing their risk of getting influenza.” – Chris Leung, M.D.</td>
<td>If you get a flu shot, you may: stop the spread of the influenza viruses; keep others free from severe headaches, coughs, fevers, and muscle pains; allow others to enjoy uninterrupted academic and personal lives; help others enjoy a happier, easier, and healthier life during the flu season.</td>
<td>Get a flu shot, for the sake of others who live and study around you!</td>
</tr>
<tr>
<td>Gain-Self</td>
<td>A Flu Shot Can Protect You</td>
<td>“Getting a flu shot protects you from getting infected with influenza viruses. As a result, it benefits you by reducing your risk of getting influenza.” – Chris Leung, M.D.</td>
<td>If you get a flu shot, you may: get an effective shield for influenza viruses; be free from severe headaches, coughs, fevers, and muscle pains; have an uninterrupted academic and personal life; enjoy a happier, easier, and healthier life during the flu season.</td>
<td>Get a flu shot, for the sake of your own health!</td>
</tr>
<tr>
<td>Loss-Self</td>
<td>Skipping A Flu Shot Can Put You At Risk</td>
<td>“Not getting a flu shot puts you at risk for getting infected with influenza viruses. As a result, it increases your risk of getting influenza.” – Chris Leung, M.D.</td>
<td>If you don’t get a flu shot, you may: become more vulnerable to influenza viruses; suffer from severe headaches, coughs, fevers, and muscle pains; struggle with an interrupted academic and personal life; face a less healthy, less happy, and more difficult life during the flu season.</td>
<td>Get a flu shot, for the sake of your own health!</td>
</tr>
</tbody>
</table>
Appendix D
Images of Stimuli Used in Study 2

**Condition 1 (Study 2): Loss-other brochure -- inside and outside pages**
Condition 2 (Study 2): Gain-other brochure -- inside and outside pages

A Flu Shot Can Protect Many

What is Influenza?
The word “influenza” describes a family of viral infections that kills between 230,000 and 430,000 people each year. The disease is readily transmitted from person to person via coughs, sneezes, and personal contact. The risk of getting influenza is always high in a community environment where contact with so many different people is inevitable.

“Getting a flu shot protects people around you by stopping the spread of influenza viruses. As a result, it benefits them by reducing their risk of getting influenza.”

—Chris Laung, M.D.

Benefits of Getting a Flu Shot
If you get a flu shot,
you may —
○ stop the spread of influenza viruses.
○ keep others free from severe headaches, coughs, fever, and muscle pains.
○ allow others to enjoy uninterrupted academic and personal lives.
○ help others enjoy a happier season and healthier life during the flu season.

A Safe and Effective Vaccine
○ The flu shot is safe and the best shield available for influenza so far.
○ The vaccine works effectively by changing yearly based on international surveillance about which types and strains of viruses will circulate in a given year.
○ One cannot get influenza from a flu vaccine.

Get a flu shot, for the sake of others who live and study around you!

Flu shots are free to all students, faculty, and staff at HKBU.

- Flu shots are available at the medical clinics on campus. Check the web for schedules. http://ms.hkbu.edu.hk/medical/mc.html

Appointment:
To schedule a same day appointment call 3111447.
## A Flu Shot Can Protect You

### What is Influenza?

The word “influenza” describes a family of viral infections that kills between 250,000 and 500,000 people each year. The disease is quickly transmitted from person to person from coughs, sneezes, and personal contact. The risk of getting influenza is always high in a university environment where contact with so many different people is inevitable.

“Getting a flu shot protects you from getting infected with influenza viruses. As a result, it benefits you by reducing your risk of getting influenza.”

—Chris Leung, M.D.

### Benefits of Getting A Flu Shot

- **If you get a flu shot, you may:**
  - get an effective shield for influenza viruses.
  - be free from severe headaches, coughs, fevers, and muscle pains.
  - have an uninterrupted academic and personal life.
  - enjoy a happier, easier, and healthier life during the flu season.

### A Safe and Effective Vaccine

- The flu shot is safe and the best shield available for influenza to use.
- The vaccine may be effective by changing yearly based on international surveillance about which type and strain of viruses will circulate in a given year.
- One cannot get influenza from a flu vaccine.

Get a flu shot, for the sake of your own health!

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**Flu shots are free to all students, faculty, and staff at HKBU.**

- Flu shots are available at the medical clinic on campus. Check the web for schedule. [http://hkbu.edu.hk/campus/medical.html#schedule](http://hkbu.edu.hk/campus/medical.html#schedule)

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**The Influenza Pandemic**

Students will be a priority every year.

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**Appointment:**

To schedule or cancel appointments call 3711447

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Condition 4 (Study 2): Loss-self brochure -- inside and outside pages

Skipping A Flu Shot Can Put You At Risk

WHAT IS INFLUENZA?

The word "influenza" describes a family of viral infections that kills between 250,000 and 500,000 people each year. The disease is quickly transmitted from person to person, from cough, sneeze, and personal contact. The risk of getting influenza is always high in a university environment since contact with so many different people is inevitable.

"Not getting a flu shot puts you at risk for getting infected with influenza viruses. As a result, it increases your risk of getting influenza."

— Chris Leung, M.D.

COSTS OF NOT GETTING A FLU SHOT

If you don't get a flu shot, you may —

○ become vulnerable to influenza viruses.
○ suffer from severe headaches, coughs, fevers, and muscle pains.
○ struggle with an interrupted academic and personal life.
○ face a less healthy, less happy, and more difficult life during the flu season.

A SAFE AND EFFECTIVE VACCINE

○ The flu shot is the best shield available for influenza so far.
○ The flu vaccine stays effective by changing every year based on international surveillance about which types and strains of viruses will circulate in a given year.
○ One cannot get influenza from a flu vaccine.

Get a flu shot, for the sake of your own health!

FLU SHOTS ARE FREE TO ALL STUDENTS, FACULTY, AND STAFF AT HKBU.

○ Flu shots are available at the medical clinic on campus. Check the web for schedule: http://hkbu.edu.hk/compus/medical.html#medical

APPOINTMENT

To schedule or cancel appointments, call 37517447.
Control Condition (Study 2): inside and outside pages

Skipping Breakfast, and Packing on the Pounds

Start the Day Right

Studies show that children who eat breakfast do better in school. It doesn’t take much further thought to realize adults will perform better at work as well. Eating a good breakfast sets the tone for the rest of the day.

If you skip breakfast, you are likely to become snid when your brain and body run low on fuel. By mid-morning, you might feel a cup of coffee or snail down a sugary snack bar to wake up again. This might work for a few minutes, but by lunch time you are hungry, cranky, and perhaps your mind might make you a little more prone to make unhealthy choices at lunch.

Good for Weight Loss

- Skipping breakfast is a common strategy for losing weight, but not a smart one.

- Many people believe that they will lose weight if they skip meals, but that just isn’t true: the body expects to be refueled a few times each day - starting with breakfast.

- Eating breakfast is good for weight loss. People who eat breakfast are more likely to maintain a healthy weight.

Making a Healthy Breakfast

A healthy breakfast should contain both protein and fiber.

- Protein can come from lean meats, eggs, or beans.

- Fiber can be found in whole grains, vegetables, and fruits.

- Carrots, pears, and juice are all smart choices for breakfast.

Eat More, Weigh Less!

For more information about nutrition, please go to http://oa.hks.hku.hk/compus

Eat More, Weigh Less

Create a healthy breakfast.

Healthy breakfast.

Healthy breakfast.

Healthy breakfast.

Healthy breakfast.

Healthy breakfast.
Appendix E
Pre-message Questionnaire

I. Using the scale below, please write the appropriate number in the blank beside each item.

Not at all true of me 1 2 3 4 5 6 7 8 9 10 Very true of me

1. ____ Even when I strongly disagree with group members, I avoid an argument.
2. ____ I respect people who are modest about themselves.
3. ____ I would offer my seat on the bus to my professor.
4. ____ Speaking up in work/task group/class is not a problem for me.
5. ____ Having a lively imagination is important to me.
6. ____ I’d rather say “no” directly than risk being misunderstood.
7. ____ I am comfortable being singled out for praise or rewards.
8. ____ I should take into consideration my parents’ advice when making education or career paths.
9. ____ I will stay in a group if they need me, even if I’m not happy with the group.
10. ____ I would sacrifice my self-interests for the benefits of my group.
11. ____ My relationships with those in my group are more important than my personal accomplishments.
12. ____ My personal identity, independent of others, is very important to me.
13. ____ I enjoy being unique and different from others.
14. ____ Being able to take care of myself is primary concern for me.
15. ____ I am careful to maintain harmony in my group.
16. ____ My happiness depends on the happiness of those in my group.
17. ____ I am the same person at home that I am at school.
18. ____ I act the same way no matter who I am with.
19. ____ I feel comfortable using someone’s first name soon after I meet them, even when they are much older than I am.
20. ____ I prefer to be direct and forthright when dealing with people’s I’ve just met.
21. ____ I value being in good health above everything.
22. ____ I have respect for the authority figures with whom I interact.
23. ____ If my brother or sister falls, I feel responsible.
24. ____ I respect decisions made by my group.
II. Please circle the appropriate number or write your answers on the lines provided. ¹
(Questions 5 to 10 were used only in Study 2)

1. Your age is: _________

2. Your gender is: 1. Male  2. Female

3. What category best describes your ethnicity?
   1. Caucasian/White (non-Hispanic)  2. Black/African-American
   3. Hispanic/Latino  4. Asian
   5. Asian American  6. Other, please specify ________

4. Please indicate which of the following category best describes your family’s household income last year before taxes.
   1. Less than $20,000  2. $20,001 - $30,000
   3. $30,001 - $45,000  4. $45,001 - $60,000
   5. $60,001 - $80,000  6. $80,001 - $100,000
   7. More than $100,000

5. What is your nationality?
   1. Hong Kong Chinese  2. Chinese
   2. Other, please specify ____________________

6. How many years do you speak English? ________

7. I consider English as my first language.
   Strongly Disagree  1  2  3  4  5  6  7  8  9  10  Strongly Agree

8. I consider English as a language that is easy to use in my daily life.
   Strongly Disagree  1  2  3  4  5  6  7  8  9  10  Strongly Agree

9. I consider English as a language that I am obligated to use at school.
   Strongly Disagree  1  2  3  4  5  6  7  8  9  10  Strongly Agree

10. I consider myself as a fluent English speaker.
   Strongly Disagree  1  2  3  4  5  6  7  8  9  10  Strongly Agree

¹ Questions 5 to 10 were used only in Study 2.
Appendix F
Post-message Questionnaire

Q1. After reading the brochure, please write down the thoughts that come to your mind. You can list your first thought on the first line, and the 2nd thought on the 2nd line, etc. Present your thoughts and ideas as concisely as possible. Ignore spelling, grammar, and punctuation. There are no right or wrong answers.

1st thought: ____________________________

2nd thought: ____________________________

3rd thought: ____________________________

4th thought: ____________________________

Q2. How did the message in the brochure you just read make you feel?

None of this feeling ←-----------------------------→ A great deal of this feeling

- **surprised**: 1 2 3 4 5 6 7 8 9 10
- **fearful**: 1 2 3 4 5 6 7 8 9 10
- **scared**: 1 2 3 4 5 6 7 8 9 10
- **sad**: 1 2 3 4 5 6 7 8 9 10
- **guilty**: 1 2 3 4 5 6 7 8 9 10
- **happy**: 1 2 3 4 5 6 7 8 9 10

Q3. When I read the brochure…

- a. I paid attention to the contents of the message.

  Strongly disagree 1 2 3 4 5 6 7 8 9 10  Strongly agree

- b. I expended efforts thinking of the contents of the article.

  Strongly disagree 1 2 3 4 5 6 7 8 9 10  Strongly agree

- c. I could follow through the message smoothly.

  Strongly disagree 1 2 3 4 5 6 7 8 9 10  Strongly agree
d. I felt the message was easy to understand.

Q4. I think the message in the brochure is__________

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Q5. After reading the brochure, I think getting a flu shot to prevent influenza is__________

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Q6. Please rate your perception of influenza on the following scales.

After reading the message, I think influenza is....

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<tbody>
<tr>
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<td>3</td>
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<td>1</td>
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<tr>
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<td>3</td>
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</table>

Q7a. After reading the message, I think__________

1) I likely will get a flu shot in a couple of days.

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<tbody>
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<td>1</td>
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<td>Strongly Agree</td>
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</table>

2) I likely will get a flu shot in a few weeks.
Q7b. After reading the brochure, ________________
4)  I intend to behave in ways that are consistent with the message.
Strongly Disagree  1  2  3  4  5  6  7  8  9  10  Strongly Agree
5)  I am going to make an effort to do what the message urged me to do.
Strongly Disagree  1  2  3  4  5  6  7  8  9  10  Strongly Agree
6)  I plan to act in ways that are compatible with the position promoted by the message.
Strongly Disagree  1  2  3  4  5  6  7  8  9  10  Strongly Agree

Q8. Please circle the appropriate number on the scale below each statement:
1)  I think I can prevent influenza without getting a flu shot.
Strongly Disagree  1  2  3  4  5  6  7  8  9  10  Strongly Agree
2)  I feel that I can prevent influenza by getting a flu shot.
Strongly Disagree  1  2  3  4  5  6  7  8  9  10  Strongly Agree
3)  I likely will be at risk for influenza during winter.
Strongly Disagree  1  2  3  4  5  6  7  8  9  10  Strongly Agree
4)  Other people likely will be at risk for influenza during winter.
Strongly Disagree  1  2  3  4  5  6  7  8  9  10  Strongly Agree
5)  The issue of influenza is relevant to me.
Strongly Disagree  1  2  3  4  5  6  7  8  9  10  Strongly Agree
6)  The issue of influenza is important to me.
Strongly Disagree  1  2  3  4  5  6  7  8  9  10  Strongly Agree
7)  Getting a flu shot can be risky to me.
Strongly Disagree  1  2  3  4  5  6  7  8  9  10  Strongly Agree

Q9a. Please indicate your assessment of the message about influenza and flu shots.
The message I just read primarily communicates ______

<table>
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<tr>
<th>costs of (not) getting a flu shot</th>
<th>1  2  3  4  5  6  7  8  9  10</th>
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</thead>
<tbody>
<tr>
<td>benefits of getting a flu shot</td>
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<tr>
<td>effects of flu vaccination on me</td>
<td>1  2  3  4  5  6  7  8  9  10</td>
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<tr>
<td>effects of flu vaccination on others</td>
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</table>

Q9b. Please rate your perception about the message you just read based on the following scales.
1) How much did the message you just read emphasize the benefits of getting a flu shot
2) How much did the message you just read emphasize the costs of not getting a flu shot?
   No costs at all  1  2  3  4  5  6  7  8  9  10  A lot of costs

3) Was the tone in the message you just read mostly negative?
   Not negative at all  1  2  3  4  5  6  7  8  9  10  Very negative

4) Was the tone in the message you just read mostly positive?
   Not positive at all  1  2  3  4  5  6  7  8  9  10 Very positive

5) Did the message you just read primarily communicate the effects of (not) getting a flu shot on you as an individual?
   No effects on me  1  2  3  4  5  6  7  8  9  10 A lot of effects on me

6) Did the message you just read primarily communicate the effects of (not) getting a flu shot on other people?
   No effects on others  1  2  3  4  5  6  7  8  9  10 A lot of effects on others

Q10. Please circle the appropriate number or write your answers on the lines provided.²

1) Before I saw the brochure, I was …
   Not familiar with influenza  1  2  3  4  5  6  7  8  9  10 Very familiar with influenza
   Not familiar with flu shots  1  2  3  4  5  6  7  8  9  10 Very familiar with flu shots

2) How often have you got flu shots in recent years?
   1=Never  2=Rarely  3=Once in a few years  4=Every year

3) Do you have any personal or other reasons to take flu shots?
   1. Yes. Please explain____________
   2. No

4) Have you ever been affected with influenza before?  1. No.  2. Yes  3. I don’t remember

5) Has any of your friends been affected by influenza before?  1. No.  2. Yes  3. I don’t know

6) Has any of your family members been affected by influenza before?
   1. No.  2. Yes  3. I don’t know

7) Has any of your family members had a flu shot before?  1. No.  2. Yes  3. I don’t know

8) Has any of your friends had a flu shot before?  1. No.  2. Yes  3. I don’t know

9) Have you ever had a flu shot before? [Skip next question if answer “2” or “3”]

² Item 12 to 15 were only used in Study 2.
1. No.  2. Yes  3. I don’t remember

10) **How do you rate your prior experience with flu shots?**

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   Bad | | | | | | | | | |

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   Unpleasant | | | | | | | | | |

11) **Have you tried to get a flu shot in the past and it was not available?**

   1. No.  2. Yes  3. I don’t remember

12) **Have you been infected with SARS before?**

   1. No.  2. Yes  3. I don’t remember

13) **Has any of your family members been infected with SARS before?**

   1. No.  2. Yes  3. I don’t know

14) **Has any of your friends been infected with SARS before?**

   1. No.  2. Yes  3. I don’t know

15) **I think SARS is…**

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   Not dangerous | | | | | | | | | |

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   Not fearful | | | | | | | | | |

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   Not a severe health problem | | | | | | | | | |

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   Very dangerous | | | | | | | | | |

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</table>
   Very fearful | | | | | | | | | |

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</table>
   A very severe health problem | | | | | | | | | |

Q11. Finally, please feel free to write down any thoughts concerning about influenza, flu shots, or the design of the brochure on the back of this questionnaire.

Thank you for your participations!
Curriculum Vitae
Nan Yu

EDUCATION
- Penn State University, College of Communications, University Park, PA (Ph.D. candidate in Journalism and Mass Communication) 08/2005-08/2009
- Ohio University, E.W. Scripps School of Journalism, Athens, OH (Master of Science in Journalism) 3/2004-7/2005
- Peking University, School of International Studies, Beijing, China (Bachelor of Law) 9/1997-7/2001

ACADEMIC PUBLICATIONS

COMPETEVIY-SELECTED CONFERENCE PAPERS

HONORS AND AWARDS
- 14th China News Award, Second Prize, Beijing, China 9/2004
- The Excellent Woman Reporter Grants, Beijing, China 6/2003
- University Fellowship, Penn State University, Beijing, China 2005-2006