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ARTICLE

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Full Length Research Paper

Attribution of government responsibility for H1N1 flu pandemic: The role of TV health news sources, self-efficacy messages, and crisis severity

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This experimental study (N=146) investigates how sources in television news (government official vs. doctor), perceptions of crisis severity (high vs. low), and perceptions of self-efficacy messages (presence vs. absence) in TV news stories about the H1N1 flu affect the public's perception of the government responsibility for the public health crisis and their personal control for preventing contraction of the H1N1 flu. Results reveal significant three-way interactions on perceptions of government crisis responsibility and personal control. Findings show that when government officials are included in news stories with messages about how to keep safe during a severe public health crisis, the public tends to see the government as less responsible for the crisis. These findings suggest that government officials should present government health messages in severe crises rather than doctors and that self-efficacy message should always be included in government health messages.

Key words: Public health crisis, crisis severity, health news source.

INTRODUCTION

As the potential for a public health crisis loomed, it was important for U.S. federal government health agencies, in coordination with local health departments, to communicate flu prevention measures in order to avoid a larger public health problem. More importantly, in the case of public health crises such as the pandemic H1N1 influenza, people make judgments as who is responsible for the cause and solution for the health issue in order to make sense of the phenomenon (Weiner, 1986). For

example, in a public health crisis, the government may bear the responsibility if a crisis occurs because the public perceives it as the government's duty to prepare and protect its people. In fact, a survey conducted by the Harvard School of Public Health (2010) revealed that even though more than half of Americans (59%) evaluated overall government response to the H1N1 outbreak as "excellent" or "good," 39% of respondents still rated the government response as "fair" or "poor."

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this, of course, necessitates the engagement of government communication managers and their expertise in public communication. The focus of this study is to examine the ingredients that might be included in government health messages and how these ingredients—alone or in combination—may affect perceptions of the government's responsibility for flu outbreaks.

Mass media, especially television news, provides the public with important information about health-related risks. In the context of H1N1, while numerous media channels carried information about the pandemic influenza, television was the most frequently cited source for H1N1 flu vaccine information (Harvard School of Public Health, 2010), due to the personal relevance of a health topic (Cooper and Roter, 2000). For example, Americans tracked news about the flu virus more closely than any other story by turning to television for information—more than 50% of people reported that they learned about the flu from network news, and more than 60% turned to cable news channels for information about H1N1 (Pew Research Center for The People and the Press, 2009). Even for young adolescents, television was the top source for their health information learning followed by radio, social media, print, and the Internet (Lariscy et al., 2010). Such trends are noteworthy because TV news can promote public awareness of health and influence health-related decisions (AbuSabha, 1998; Mebane, 2003; Newport, 2002).

By conducting an experiment, the purpose of this study is to examine the effects of three variables in TV health news stories (the level of crisis severity, the inclusion of self-efficacy messages, and the type of health news sources) on the public's perceptions of the government responsibility, their personal control and the government's control in terms of managing the H1N1 public health crisis. These variables help us understand how the public perceives these public health risks in the context of a novel public health threat (Slovic, 1987).

UNDERSTANDING FACTORS OF PUBLIC HEALTH NEWS

Severity Level in Public Health News

In health-related news coverage, the severity of a health problem is described as either mild or severe. Severity of health problems can be defined as a state involving levels of medical symptoms, injuries, or the possibility of death. Highly severe conditions concern serious symptoms, injuries, and even death, whereas less severe conditions involve minor symptoms and little potential for significant health problems. The effects of the severity level of a health problem relates to the degree to which people perceive the level of health risk and can be explained by Weiner's attribution theory (1974, 1986) in crisis communication (Coombs, 1998). Attribution theory

posits that people make judgments about the causes of events, especially for causes that are negative and unexpected. Pandemic H1N1 flu meets two key criteria of a public health crisis—it was unexpected and poses a public threat in 2009. Weiner (1986) argued that people seek causes for an event and attribute responsibility for the event in order to make sense of a social phenomenon. In a public health crisis, when the government is typically responsible for preparing the public, the government may bear the brunt of the blame if there is a crisis. Liu and Horsley (2007) also argued that the level of government responsibility for handling a crisis would be greater than that of the private sector when the public's safety is at risk.

To explain when and why people ascribe responsibility to the government, this study uses the concept of crisis responsibility (Coombs, 1998), which can be the degree to which people blame the government for the prevalence of pandemic flu in the field of public health. This study also looked at two causal dimensions underlying attributions: personal control and external control. McAuley et al. (1992) argued that the control should be further differentiated in terms of whether the cause is (a) controllable or uncontrollable by the person (personal control) and (b) controllable or uncontrollable by others (external control). Thus, this study examined how people seek out causal attribution for a public health crisis and attribute responsibility to the government depending on the severity level of a public health crisis.

Previous work has investigated the relationship between the severity level of health risks and perceptions of organizational responsibility and argued that more severe health risks lead the public to assign greater responsibility to an organization (Park, 2008). Therefore, if health news portrays the severity level of health risks as highly severe, the perceived estimation of the government's responsibility for the crisis would be greater than if there were a low level of health risk. Thus, the following hypothesis is proposed.

H1: The severity of the H1N1 pandemic (*high* or *low*) as portrayed in the health news story would affect participants' perceptions of 1) the government's responsibility, 2) personal control, and 3) government (external) control.

Self-Efficacy in public health news

Self-efficacy is the belief that one is capable of executing the courses of action required to manage unpredictable or challenging situations (Bandura, 1997). Such beliefs determine how people feel, think, and motivate themselves to act. Bandura (1977) expands this concept as *outcome expectancies* and *efficacy expectancies*. Outcome expectancy is a person's estimate that certain behaviors will lead to certain outcomes whereas an efficacy expectancy is the belief that one can successfully

carry out specific behaviors in order to produce the outcomes (Bandura, 1977). The former is a belief about one's environment, while the latter is a belief about one's competence (Gecas, 1989). The importance of such distinction lies in the fact that feelings of helplessness can result both from low self-efficacy or the social environment being too challenging or unresponsive of one's action to change. Thus, this conceptualization differentiates between efficacy perceptions based solely on one's own ability and perceptions of self in connection to the social environment (Bandura, 1977, 1984). In this sense, even when efficacy expectancies are high, it may not always lead to perceptions of responsibilities being internal due to the influence of outcome expectancies.

In the area of government communication, the persuasive influence of government-sponsored messages on the public's perception of the government's role in mitigating the public health crisis should be investigated. By taking the concept of self-efficacy, Anderson (2009) argued that sources of self-efficacy information about a public health crisis could increase the public's confidence that the government is coping very well with threatening situations by creating expectations of successfully managing the public health. In other words, the presence of self-efficacy as a form of outcome expectancy could decrease the public's doubt that the government cannot successfully prevent people getting infected. On the other hand, Burke et al. (2009) suggest that self-efficacy brings forth a strong sense of personal responsibility for one's health, while, Minkler (1999) suggests another paradigm for looking into responsibilities of health outcomes and behavior change, posing the need to understand that an individual's self-efficacy should be applied into the broader social, political context for actions of change. Therefore, an individual's self evaluation and perception of one's efficacy can either be attributed to individual responsibilities of public health crisis or sociopolitical responsibilities of the public health crisis, depending on the context. Thus, the following hypothesis about the impact of self-efficacy messages on the public's attributions in the present public health crisis situations is offered.

H2: Self-efficacy messages (*presence* or *absence*) would affect the public's perception of 1) the government's responsibility, 2) personal control, and 3) government (external) control.

Sources of public health news

Previous research on health news has paid attention to the news sources used by health journalists based on various theoretical frameworks. Applying Shoemaker and Reese's (1991) news production process model, Viswanath et al. (2008) found that television health journalists heavily relied on source suggestions than did print media journalists. More specifically, medical experts

are the most cited sources in health news (Atkin et al., 2008; Viswanath et al., 2008), and government agencies are perceived to be responsible for a public health crisis, especially for an influenza pandemic (Mounier-Jack and Coker, 2006). Thus, during a public health crisis, representatives from U.S. government agencies, such as the Center for Disease Control and Prevention or the Food and Drug Administration, announce updated information or respond to journalists' questions at the media conference briefing (Nucci et al., 2009). On the other hand, a medical professional, who was operationalized as a doctor, has an influence in increasing perceived credibility of health information than a layperson source due to their professional expertise in health (Hu and Sundar, 2010). However, even though one of the most frequently quotable sources in the health news is a medical expert, journalists' source selection of health news was also influenced by journalists' educational background. For instance, research shows that journalists with a bachelor's degree or less used medical experts as sources, whereas those with a master's degree or more cited government officials more often (Wallington et al., 2010).

If there were differences in the journalists' actual use of sources from the government or medical professionals, would there also be differences in how the public perceives the pandemic public health crisis based on the source? The case of pandemic flu requires the government to act. Thus, federal government officials at the CDC and the Department of Homeland Security (DHS) delivered public health information about the pandemic flu through various forms of promotional materials. However, there have been negative views on the impact of government-sponsored video news releases on the public's assessment of health risks (Connolly-Ahern et al., 2010; Liu and Horsley, 2007). In fact, it is possible that the public's assessment of the government's response to the pandemic flu differs by source, that is, doctors or government officials. Therefore, it is necessary to examine the effect of the quoted source in the health news on the people's perceptions as follows:

H3: The source (*doctor* vs. *government official*) would affect the public's perception on 1) the government's responsibility, 2) personal control, and 3) government (external) control.

Since this study investigates three potential factors affecting the public's perceptions of personal control, external control, and the crisis responsibility of the government regarding a public health crisis, the following research questions are created to explore the three-way interactions among three independent variables: severity level, self-efficacy, and the source of public health news.

RQ1: Is there a three-way interaction between severity level (*high* vs. *low*), self-efficacy messages (*presence* or *absence*), and the source of health news (*doctor* vs.

government official) on perceptions of (1) the government's crisis responsibility, (2) personal control, and (3) government (external) control?

RQ1a: Is the interaction between self-efficacy messages (*presence* or *absence*) and the source of health news (*doctor* vs. *government official*) the same at each level of severity?

RQ1b: Is the interaction between severity level (*high* vs. *low*) and the source of health news (*doctor* vs. *government official*) the same at each level of self-efficacy?

RQ1c: Is the interaction between severity level (*high* vs. *low*) and self-efficacy messages (*presence* or *absence*) the same at each level of the source?

METHOD

Design

This study used a 2 (*severity level*: high vs. low) x 2 (*self-efficacy messages*: presence vs. absence) x 2 (*Source*: government official vs. doctor) mixed-subjects factorial design. Severity level and self-efficacy were between-subject factors, and the quoted source in the news was a within-subjects factor with two levels, government official and doctor. Thus, participants were randomly assigned to one of four groups based on the combinations of severity and self-efficacy factors, and viewed two public health news stories with each type of source. The experiment was conducted in mid-October 2009 before U.S. President declared swine flu a national emergency and also right after the vaccine first became available.

Participants

Participants were recruited from required undergraduate courses¹ at a large Midwestern university and were offered extra credit for their participation. A total of 146 undergraduate students (65% female) participated in this experiment. Nearly equal numbers of approximately 37 participants were randomly assigned to each condition of four different combinations of the between-subject factors, severity and self-efficacy. A majority of participants were sophomores ($n = 69$, 47.3%) or juniors ($n = 65$, 44.5%) with mean age of 20 ($s.d. = 1$).

Stimuli and independent variables

The public health crisis situation context for this experiment was the 2009 H1N1 flu. Thus, this study used television newscasts about the H1N1 flu in which different sources, such as government officials from the CDC and the DHS, or doctors, illustrated either a high or low level of severity of the H1N1 flu, as well as either the presence or the absence of self-efficacy messages. The content of the stimulus material was based on the real newscasts about the H1N1 flu, but were edited slightly into a 1 to 3 minute newscast in order to make them look as similar as possible to avoid any

incidental confounds. That is, other elements of the news contents across the four conditions were held constant but differed only in their levels of severity, self-efficacy messages, and sources. As the two between-subject independent variables are *severity* and *self-efficacy messages*, this study created two different versions of television newscasts: 1) high severity level and the presence of self-efficacy messages and 2) low severity level and the presence of self-efficacy messages. For the two versions without a self-efficacy message, the same video messages were included except the self-efficacy messages were edited out. Thus, all four versions of the newscast were created for each type of source and were identical except for the manipulations and lengths due to the condition of the absence of self-efficacy messages.

More specifically, the severity level of the H1N1 flu was manipulated first. In a newscast manipulated as the condition of high severity of the H1N1 flu, the source, either government officials or doctors, described the flu as "pandemic," "very severe," and "very concerning." In the condition of low severity of the H1N1 flu, the source described the H1N1 flu as "NOT an emergency," "very mild," "very consciously optimistic," "not any more severe," "not stronger than normal seasonal flu," and "nothing has changed." Then, the condition of self-efficacy was manipulated to represent either presence or absence of self-efficacy information. The self-efficacy message was operationalized as providing possible actions people could take to prevent catching the H1N1 flu (i.e., washing hands thoroughly, staying away from crowded areas). In the condition of the absence of self-efficacy, such self-efficacy information was omitted. Source in the health news was manipulated as either a doctor or a government official.

Procedures

The experiment took place at a computer lab, where participants were randomly assigned to one of four different experiment websites installed on a computer based on the combination of severity level (high vs. low) and the self-efficacy condition (presence vs. absence). Participants were asked to sit on a computer and to wear headphones to watch two different television broadcast news with each type of source. Then they were asked to answer questions about the stories and their demographic information. Experimental materials were arranged in this order: first television news with one type of source, a first set of questionnaires, second television news with the other source, a second set of questionnaires, and demographic information. To control carryover effects, the order of two television broadcast news was counterbalanced.

Measurement of the Dependent Variables

Crisis responsibility, the degree to which people blame the organization for the crisis, was measured using two items adopted from Griffin and Babin's (1992) study about the attribution of responsibility. The items were: (1) "How responsible was the government for swine flu?" measured on a 7-point Likert-type scale ranging from 1 (*not at all responsible*) to 7 (*totally responsible*), and (2) "To what degree do you think the government should be blamed for swine flu?" also measured on a 7-point Likert-type scale ranging from 1 (*not at all to be blamed*) to 7 (*absolutely to be blamed*). Cronbach's alpha was .80.

Personal control, which referred to whether a person perceived they have control over getting the H1N1 flu, was measured using three items adopted from McAuley et al.'s (1992) revised causal dimension scale. Participants were asked their agreement as to whether the cause of the H1N1 flu is something "manageable by you," "you can regulate," and "you have power over." Responses were given on a Likert-type scale with 1 (*strongly disagree*) to 7 (*strongly agree*). Cronbach's alpha was .87.

¹ The 2009 H1N1 influenza virus was especially a risk to young people and most H1N1-related deaths occurred among the young, including those who were otherwise healthy as well as those with compromised immune systems (Center for Disease Control and Prevention (CDC), 2009). Thus, college students were at higher risk for the H1N1 influenza during the time of this study (CDC, 2010; Van et, 2010).

External control, referred to whether the H1N1 flu is perceived to be controllable or uncontrollable by the government, was measured using a similar three-item scale adopted from McAuley et al. (1992). Participants were asked to evaluate that the cause of the H1N1 flu as something “manageable by the government,” “the government can regulate,” and “the government has power over,” using the same response scale as for personal control. Cronbach’s alpha was .90.

RESULTS

Manipulation checks and analyses

A series of analysis of variances (ANOVAs) were conducted to perform the manipulation checks. The manipulation check for the severity level was conducted using the item, “What is the level of severity you feel the H1N1 flu was given in this news story?” The result showed that the mean score for the condition of high severity ($M = 6.07$) was significantly greater than the mean score for the condition of low severity ($M = 3.18$), $F(1, 144) = 316.0, p = .000$. In addition, the manipulation check for self-efficacy was performed using the item, “Does this video illustrate specific actions you can take to prevent catching H1N1 flu?” The result showed that the presence of self-efficacy condition ($M = 4.13$) was significantly different from the absence of self-efficacy condition ($M = 1.76$), $F(1, 144) = 206.33, p = .000$. A manipulation check for source types was not conducted because the manipulations of sources were clearly either doctors or government officials. No matter what participants thought about the source of the news message, the messages did differ in the source type, which were clearly message attributes and not matters of participant perceptions (O’Keefe, 2003).

All analyses were done using a multivariate ANOVA (H1 and H2) or repeated measures ANOVA (H3 and RQ1), using $p < .05$ as the test levels of significance.

Hypotheses and research questions

H1 examined the impact of the crisis’ level of severity on participants’ perceptions of the government’s crisis responsibility, their personal control and the government’s (external) control of the public health crisis represented by the H1N1 flu. The only significant main effect was for perceptions of crisis responsibility, $F(1, 144) = 4.70, p = .03, \eta^2 = .03$, and no other main effects were significant for perceptions of personal control, $F(1, 144) = .09, p > .05, \eta^2 = .00$; for perceptions of government (external) control, $F(1, 144) = 1.04, p > .05, \eta^2 = .01$. That is, those who saw the TV news story indicating the H1N1 flu was more of a severe crisis ($M = 2.49, SD = 1.27$) perceived the government as more responsible for the crisis than did those who saw a TV news story depicting the crisis as low in severity ($M = 2.10, SD = 1.25$).

H2 proposed the main effect of self-efficacy messages

on perceptions of the government’s responsibility for the crisis, personal control and the government’s control. The data analysis showed no significant main effect for perceptions of the government’s crisis responsibility ($F(1, 144) = .96, p = .33, \eta^2 = .01$), personal control ($F(1, 144) = .50, p = .48, \eta^2 = .00$), and the government’s control ($F(1, 144) = .20, p = .66, \eta^2 = .00$).

H3 tested whether having a doctor or a government official present the message would have a direct or main effect on the dependent variables. Results showed no significant main effect on perceived crisis responsibility ($F(1, 145) = .86, p = .36, \eta^2 = .01$), personal control ($F(1, 145) = .00, p = .10, \eta^2 = .00$), and the government’s control ($F(1, 145) = 3.57, p = .06, \eta^2 = .02$).

RQ1 asked about three-way interaction effects and revealed that the severity—self-efficacy—source interaction was significant for perceptions of the government’s responsibility ($F(1, 142) = 14.40, p = .000, \eta^2 = .092$) and personal control ($F(1, 142) = 5.22, p = .024, \eta^2 = .035$). However, there were no significant three- or two-way interactions for government (external) control. Since there was a significant three-way interaction on crisis responsibility and personal control, each two-way interaction for crisis responsibility and personal control was analyzed separately for each level of the third factor in RQ1a, RQ1b, and RQ1c.

RQ1a asked whether the interaction between the condition of self-efficacy messages and the source type is the same at the two severity levels. The repeated measures ANOVA results showed significant interaction effects between self-efficacy messages and the source on perceptions of the government’s crisis responsibility ($F(1, 142) = 15.96, p = .000, \eta^2 = .18$), and personal control ($F(1, 142) = 4.66, p = .03, \eta^2 = .061$), only under the high severity level. As shown in Figure 1, only when the news story conveyed the flu crisis had a high level severity was the level of the government’s responsibility for the crisis influenced by the presence or absence of self-efficacy messages in combination with the source type. Specifically, in the high severity condition, perceptions of the government’s crisis responsibility was significantly greater when the source was a doctor and self-efficacy messages were offered ($M = 3.03, SD = 1.63$) than when the source was a doctor and self-efficacy messages were not offered ($M = 2.11, SD = 1.16$). On the other hand, when the government official was the source in the high severity condition, there was no difference in perceptions of the government’s crisis responsibility based on the presence of self-efficacy messages ($F(1, 142) = 1.03, p = .31$).

Regarding the significant interaction effect between self-efficacy messages and the source type on personal control at each level of severity, only under the high severity condition, personal control was greater when the source was a government official ($M = 3.98, SD = 1.37$) compared to when the source was a doctor ($M = 3.42, SD = 1.69$) in the presence of self-efficacy message (Figure

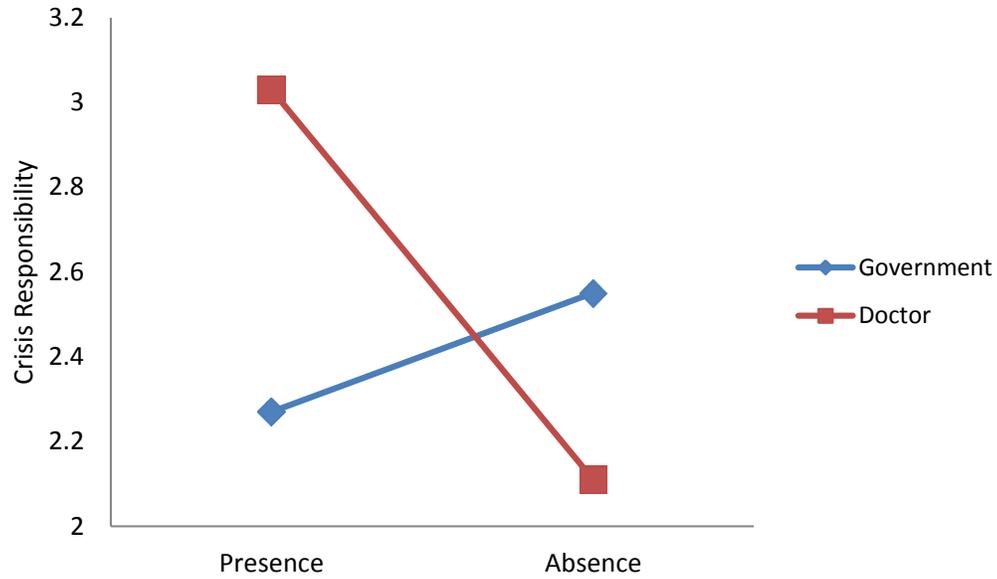


Figure 1. Interaction between self-efficacy and source on crisis responsibility for the high severity condition only.

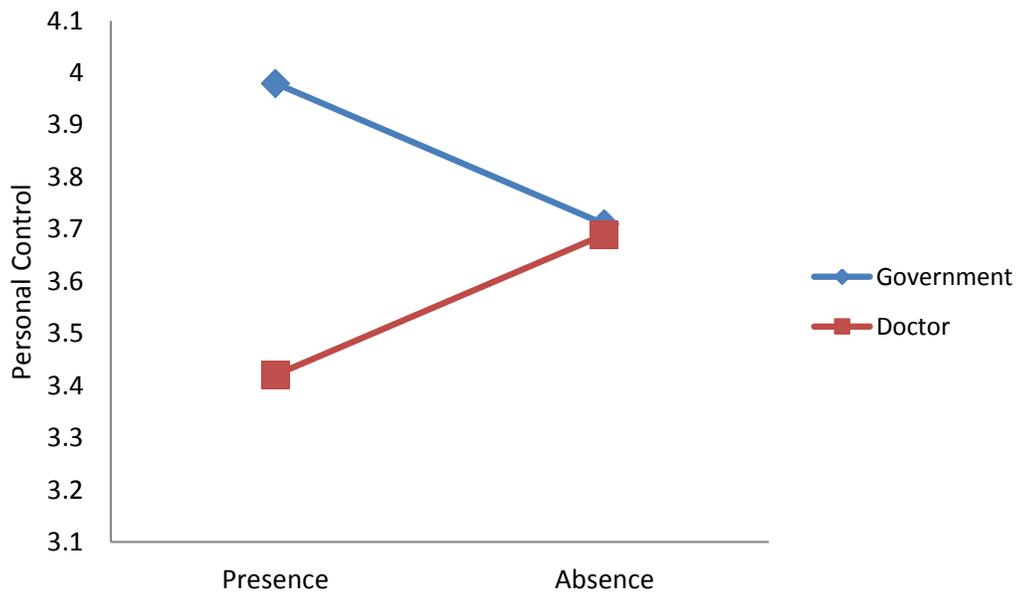


Figure 2. Interaction between self-efficacy and source on personal control for the high severity condition only.

2). Participants' attribution of controllability of the H1N1 flu to themselves was much greater when a government official explained what people can do to prevent the H1N1 flu compared to when a doctor described it. However, even under the high severity condition, there was no difference in personal control between two different sources (government and doctor) in the absence of self-efficacy methods.

RQ1b addressed the interaction between the source type and severity level at each level of self-efficacy. The repeated measures ANOVA results demonstrated that the interaction effect between the source type and severity level on perceptions of the government's responsibility for the crisis was significant for both the presence and absence of self-efficacy messages but in the opposite direction and only under the high severity (F

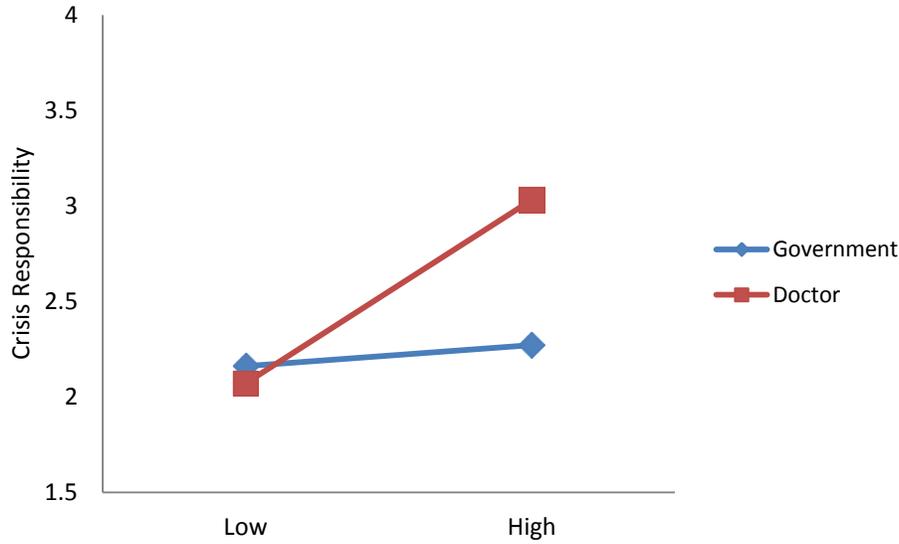


Figure 3. Interaction between severity level and source on crisis responsibility for the presence of self-efficacy condition.

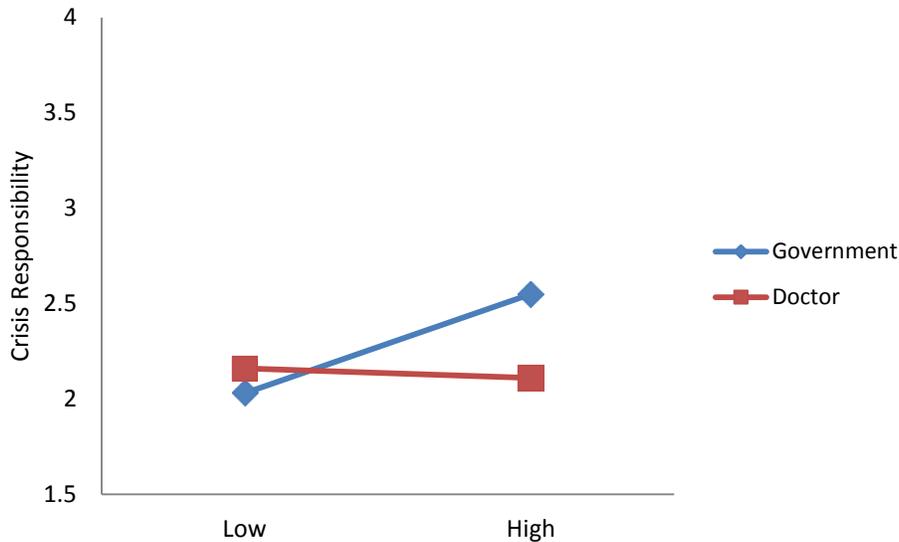


Figure 4. Interaction between severity level and source on crisis responsibility for the absence of self-efficacy condition.

(1, 142) = 7.32, $p = .009$, $\eta^2 = .10$ and $F(1, 142) = 7.47$, $p = .008$, $\eta^2 = .094$, respectively; Figures 3 and 4). When self-efficacy messages are included in the news story and the flu is presented as high in severity, perceptions of the government’s crisis responsibility were much greater when the source was a doctor ($M = 3.03$, $SD = 1.63$) than when the source was a government official ($M = 2.27$, $SD = 1.07$). Conversely, in the absence of self-efficacy messages under the high severity condition, perceptions of the government’s crisis responsibility was much greater when the source was a government official ($M = 2.55$, SD

= 1.32) compared to when the source was a doctor ($M = 2.11$, $SD = 1.16$). Under the low severity condition, there were no significant differences.

The interaction between the source type and severity level on personal control was significant only when self-efficacy messages were present, $F(1, 142) = 16.80$, $p = .000$, $\eta^2 = .20$. As Figure 5 shows, the effect of source on personal control was significant for both low and high severity levels but in the opposite direction ($F(1, 142) = 6.01$, $p = .017$, $\eta^2 = .08$ and $F(1, 142) = 11.28$, $p = .001$, $\eta^2 = .14$, respectively), only under the presence of self-

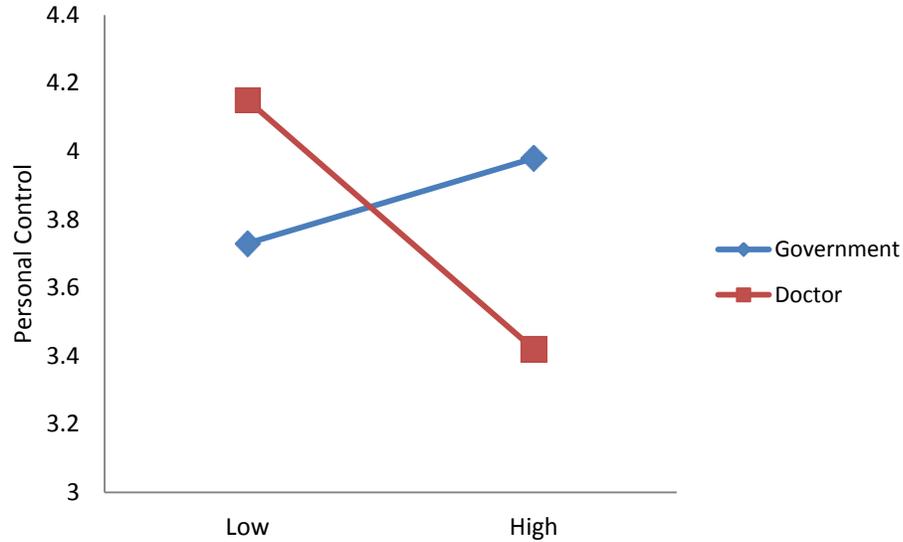


Figure 5. Interaction between severity level and source on personal control for the presence of self-efficacy condition only.

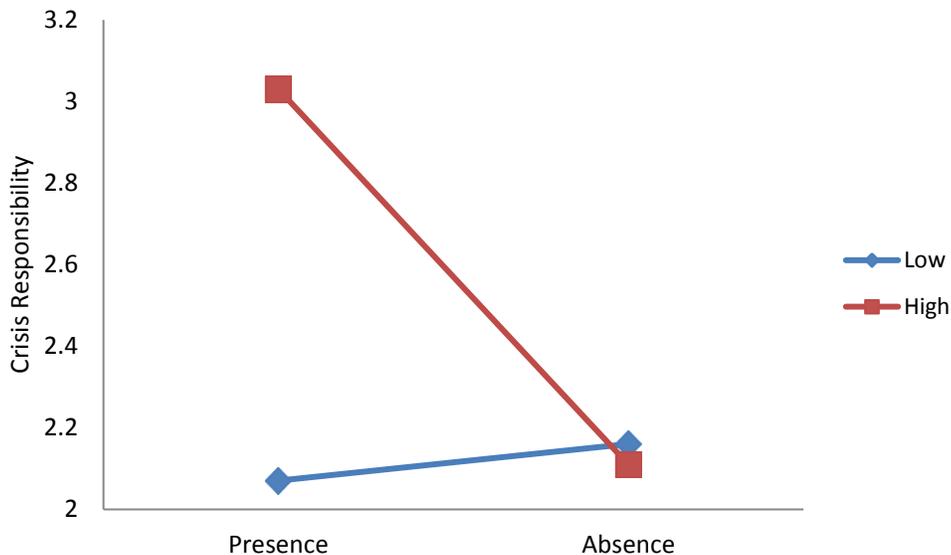


Figure 6. Interaction between self-efficacy and severity level on crisis responsibility for the doctor source only.

efficacy. In the low severity condition when self-efficacy messages were present in the news stories, participants felt greater personal control when the story source was a doctor ($M= 4.15, SD = 1.66$) than when the source was a government official ($M= 3.73, SD = 1.45$). However, in the high severity condition when self-efficacy messages were present in the news stories, participants felt greater personal control when the source was a government official ($M= 3.98, SD = 1.37$) than when the source was a doctor ($M= 3.42, SD = 1.69$).

RQ1c examined the interaction effect between self-

efficacy messages and severity level at each type of source. Since the type of source was a within-subject factor, univariate ANOVAs were conducted for each type of source. The results showed that the interaction between self-efficacy and severity was only significant for crisis responsibility but only when the source was a doctor, $F(1, 142) = 5.79, p = .017, \eta^2 = .04$ (Figure 6). Only when the source was a doctor and the self-efficacy message was present, high severity level ($M = 3.03, SD = 1.63$) produced greater perceptions of the government's crisis responsibility than did the condition of low severity

($M = 2.07$, $SD = .92$). When a doctor provides information on how to avoid getting the H1N1 flu, participants attributed more responsibility to the government for the H1N1 flu in the high severity condition than in the low severity condition.

DISCUSSION

Our findings are notable on two levels. First, they offer specific recommendations for government officials who communicate during the annual flu season and offer recommendations for public health communication depending on whether the flu season is perceived as severe or not severe. Second, the results offer public health researchers more insights into the complex interplay of variables that are at work in shaping the effects of media messages about public health risks.

First, the findings of this study demonstrate that the doctor or government official as the source alone does not appear to influence perceptions of the government's responsibility for the crisis or perceptions of personal control of the crisis. Our results show that when government officials are included in news stories about flu pandemics and the public health threat is severe, the public tends to see the government as less responsible for the crisis when the government explained what people could do. It also shows that if medical doctors are out front providing the public with messages about how to keep safe during a severe crisis, it leaves the participants with the perception that the government is more responsible for the flu crisis. It means that government communications managers should be out at the forefront delivering self-efficacy messages to the public in flu seasons when a flu pandemic has the potential to be severe.

Second, in severe crisis situations, if the government official is offering self-efficacy messages, i.e., how to protect oneself from the flu, participants feel that they are empowered with greater perceived personal control. However, when the crisis is not severe it appears that hearing the message from a doctor gives participants more perceived control. It means that when a crisis is not considered severe, i.e., there is no larger crisis, people feel a sense of personal control hearing from a doctor about what can be done to prevent one from getting the flu.

In terms of public communication research, these findings reflect the previous findings, showing that the relationship between self-efficacy and attributions of responsibility are largely dependent on the magnitude and context of the situation (Bandura, 1977; Minkler, 1996). Our findings also show that the public's personal control is negatively associated with the perceptions of crisis responsibility but only under the conditions of high severity and the presence of self-efficacy messages. During a public health crisis, people feel that they have little personal control and the government has high

societal responsibility to protect the public (Miles and Frewer, 2003). In this study, in the high severity condition, the government's self-efficacy messages have an influence in producing strong personal control, and in turn lessen the attribution of responsibility for the crisis to the government. In contrast, a doctor's self-efficacy messages in the high severity condition lessen the public's sense of personal control, and in turn intensify the responsibility assigned to the government. It means that the government can create rules and regulations for people to follow during the serious public health situation, but doctors in and of themselves cannot. This may make people feel more personal control in a severe condition if they feel that the government is making others control their behavior too.

Given the nature of a public health crisis where it is a default to turn to government officials of explanations and remedies for treatment, it may be that the absence of a government official triggered annoyance and anger among the participants, resulting them to ascribe greater responsibility to the government when a doctor took the place of a government official to explain the public health crisis and provide methods of prevent. Research on the 2009 H1N1 pandemic looked at whether the health news coverage of the H1N1 during the first five months is consistent with the CDC's information but it was not quite consistent in terms of the severity and self-efficacy messages (Goodall et al., 2012). Interestingly, the current study shows that, even though there is no difference in the perception of government responsibility for a public health crisis between the presence and the absence of self-efficacy messages from the government, the government's self-efficacy messages are effective in aiding the viewers to feel in control of their health during a severe public health crisis, and in turn lessen perceptions of government responsibility. Thus, the interactions among three variables (severity level, self-efficacy, and the source of public health information) should be considered as important determinants in shaping perceptions of the government's crisis responsibility or perceptions of personal control of the crisis in the field of public health communication.

These findings yield practical implications for communication personnel at local public health departments as well as federal government agencies. The interplay among self-efficacy messages, perceived level of crisis severity, and the sources of public health information demonstrates how they can predict the effects of public health crisis information. It is more important that people are able to trust organizations with responsibility for the public health protection compared to circumstances where the public perceives that they are able to make an informed choice about self-efficacy methods (Miles and Frewer, 2003). It means that government officials should present government health messages in severe crises rather than doctors and that self-efficacy messages should always be included in government health messages. This finding also recommends that public

health professionals can work to give the reporters perspective so they don't "overblow" the severity of the pandemic in their news reports. Thus, communication practitioners in government sectors can benefit from such findings in that for severe public health crises. It would be important associates from government organizations to provide specific guidelines for severe flu to people on how to prevent spreading the disease. Overall, by demonstrating the effects of different message processing of three sub-text message factors in the public health crisis news, this study offers public health professionals some additional guidelines on how to design tailored messages during a public health crisis in order to increase the public's awareness of preventative behaviors they can engage in during a public health crisis as well as minimize the responsibility placed on the government for controlling the pandemic.

These findings presented here have some limitations. First, future study should conduct an experiment with a new health threat to provide public health communication practitioners with a general pattern of how people ascribe responsibility and controllability of pandemic diseases. Moreover, the results should be interpreted with caution given the student sample studied. The replication with the larger size of more representative samples should be examined in order to increase generalizability about the interactions. Additionally, the effect of other sources, such as patients and Internet discussion board messages should be examined to investigate the most effective source for delivering persuasive public health messages. It will also be interesting to examine whether the three independent variables have an impact on television viewers' actual behavior intentions to follow the preventive directions proposed in the pandemic flu messages, such as getting vaccinated for the H1N1 flu.

More research is needed to explore whether other variables that could potentially be a part of the complex psychological defense mechanism to protect themselves from the severe pandemic flu. For example, perceived uncertainty or fear resulting from watching newscasts about the pandemic flu could mitigate the effects of three variables on the public's attribution of the government responsibility or controllability either to the self or to others. It appears that people either seek information or avoid seeking information depending on perceived uncertainty after media exposure to pandemics (Avery and Kim, 2008). Since the experiment was conducted right after the vaccine first became available, the degree of participants' uncertainty could undermine the effect of severity or self-efficacy. Thus, future research should examine how other variables, such as uncertainty or fear aroused from media exposure to pandemics, interact with severity, self-efficacy, and sources.

Conflict of Interests

The authors have not declared any conflict of interests.

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