



How organizations framed the 2009 H1N1 pandemic via social and traditional media: Implications for U.S. health communicators

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ABSTRACT

Through a quantitative content analysis, this study reveals how 13 organizations differently framed the 2009 H1N1 flu pandemic crisis via their traditional ($n = 211$) and social media ($n = 534$) responses. When framing the crisis as a disaster, a health crisis, or a general health issue organizations relied more on traditional than social media. However, they tended to use social media as much as traditional media when framing the pandemic as a general crisis. In addition, organizations relied more on traditional media to address emotions than on social media. Together, the study's findings provide applied and theoretical insights for scholars and crisis managers.

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On June 11, 2009 the World Health Organization (WHO) declared the first global flu epidemic in 41 years (Associated Press, 2009). Although relatively mild in severity, the H1N1 flu outbreak became a pandemic because of its ability to rapidly spread among communities around the globe. At first, the media extensively covered the outbreak with 60 articles published in the *New York Times* during the first two weeks of the crisis. However, weeks into the crisis media and public attention subsided despite that the virus continued to rapidly spread. Therefore, the 2009 flu pandemic posed a significant challenge to crisis managers: Keeping the public informed and engaged during a multi-month health crisis.

In this study we evaluate how 13 organizations addressed this challenge through examining their social and traditional media responses. The findings provide valuable insights because the pandemic occurred during a time when social media outlets were beginning to become mainstream vehicles for issuing crisis responses (Sutter, 2009). In addition, an emerging infectious disease such as H1N1 demands immediate action from organizations because it poses a serious threat to the health of people worldwide (Cummings, 2009). As such, due to the timing of the 2009 H1N1 pandemic as well as the necessity for a large-scale response this crisis is an ideal case to examine how organizations used traditional and social media to respond.

As a result, the study's findings contribute to the limited literature on using social media to respond to crises (e.g., Coombs, 2008; Sweester & Metzgar, 2007). In addition, the findings add to the growing literature on understanding how crisis responses are framed (e.g., An & Gower, 2008; Choi & Gower, 2006) and differences between corporate and government crisis communication practices (e.g., Lee, 2009; Perry, Taylor, & Doerfel, 2003).

1. 2009 H1N1 crisis background

Before reviewing the literature that informed our research questions, we briefly summarize the origin and outcomes of the 2009 H1N1 crisis to provide context for the study (see Fig. 1).

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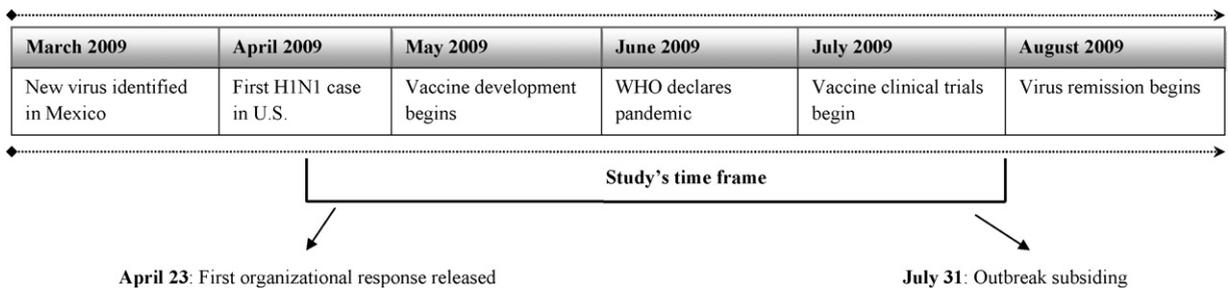


Fig. 1. 2009 H1N1 pandemic milestones: March–August 2009.

On March 28, 2009, the first known case of H1N1 was reported in Mexico. Two weeks later, the first H1N1 case was reported in the United States. By April 30, nearly 300 schools had closed across the U.S. in an attempt to limit the spread of the virus. The U.S. government responded by announcing on May 3 that vaccine development was under way. By May 20, H1N1 cases worldwide exceeded 20. In response, the World Health Organization declared that the H1N1 outbreak was a pandemic on June 11, making H1N1 the first global pandemic in 41 years (“Swine flu events”).

In July, clinical trials for an H1N1 vaccine were underway in the United States. However, by August, the U.S. government declared that the outbreak was subsiding significantly (“H1N1: Meeting the challenge”). By the end of the year, a federal government report stated that the H1N1 pandemic could end up being the mildest pandemic on record (“Swine flu events”). From a financial perspective, however, the pandemic was not mild. The pandemic had a \$500 million impact on U.S. pork producers and an estimated \$125–150 million impact on individual airlines (“Hog industry,” 2010; Trubey, 2009). Further, a report released in January 2011 revealed that the U.S. government spent just over \$200 million responding to the H1N1 pandemic including \$131 million to buy 21 million vaccine doses (“\$200 million spent,” 2011).

2. Literature review

We now review the three primary research streams that contributed to our research questions: (1) new media, crisis communication, and emotions, (2) framing crises, and (3) crisis communication practices by sector.

2.1. New media, crisis communication, and emotions

Research examining new media and crisis communication primarily focuses on Web sites (e.g., Kent & Taylor, 1998; Perry et al., 2003; Taylor & Kent, 2006) and blogs (e.g., Bates & Callison, 2008; Liu, 2009; Sweester & Metzgar, 2007). This research finds that individuals seek out new media because they often provide an unfiltered, up-to-date line of communication and information that cannot be found elsewhere (Johnson & Kaye, 2010; Procopio & Procopio, 2007; Rainie, 2005). Actively incorporating new media into crisis responses has tangible benefits for organizations. For example, individuals who read blogs may perceive a lower level of crisis for an organization than those not exposed to blogs (Sweester & Metzgar, 2007). Also, individuals participating in online bulletin boards may attribute crisis responsibility differently than newspaper journalists (Choi & Lin, 2009). Finally, individuals may equally trust third-person blogs and blogs sponsored by organizations experiencing crises (Bates & Callison, 2008).

Given these benefits, it is necessary for organizations to incorporate social media into their issues management. One particularly promising area where organizations potentially can enhance their relationships with key publics during crises is through fostering emotional support. Extensive research concludes that publics' emotional responses to risks often dictate how they respond to crises (e.g., Dunlop, Wakefield, & Kshima, 2008; Leslie, 2006; Ropeik, 2006). Further, emerging research finds that publics seek out social media because they uniquely provide emotional support during crises (e.g., Choi & Lin, 2009; Kaye, 2005). For example, Kaye (2005) identified expression and affiliation as primary motivations for accessing blogs. Similarly, Phillips (2008) identified interpersonal attachments as primary motivations for using social media. Organizations experiencing crises can gain publics' emotional support by communicating emotion-laden messages through social media (Choi & Lin, 2009; Stephens & Malone, 2009). Leading crisis communication scholars recommend that all organizations experiencing crises disseminate empathetic communication to foster trust and motivate publics to take positive actions (e.g., Coombs, 2007; Seeger, Sellnow, & Ulmer, 2003). Crisis communication scholars have identified a wide range of emotions organizations can incorporate into their crisis responses depending upon the crisis situation: alert, anger, contempt/disgust, confusion, fear/anxiety, relief, sadness, shame, and sympathy/compassion (e.g., Choi & Lin, 2009; Coombs & Holladay, 2005; Jin, 2009). However, researchers have not explored how these emotions are employed differently via traditional and social media. Given that anecdotal evidence suggests that the 2009 H1N1 flu pandemic generated strong emotional responses from a variety of publics and across multiple brands and categories (American Psychological Association, 2009; Blackshaw, 2009) we ask:

RQ1: Is there a difference in how organizations incorporated emotions in their responses to the 2009 H1N1 pandemic via social and traditional media?

The answer to this research question indicates whether organizations attempted to meet different emotional needs via their social and traditional media responses.

2.2. Framing crises

During a pandemic flu crisis, the ability of organizations to connect with those affected may mean the difference between life and death (Reynolds & Quinn, 2009). How organizations depict an issue is particularly impactful in the early hours and days of an event (Murphree, Reber, & Blevens, 2009). Through framing, organizations connect with the public by telling the crisis story (de Vries, 2004). Framing recognizes the ability of a text to define a situation, issue, and to set the terms of a debate (Entman, 2003; Tankard, 2001). Frames also limit the range of interpretable meanings (Durham, 1998), though other factors influence whether publics adopt frames including cultural resonance and moral values as well as counter frames offered by the media and other publics (Edy & Meirick, 2007; Luther & Zhou, 2005).

Applied to organizations' public communication, framing analysis allows researchers to identify how organizations narrate their viewpoints of critical issues (Hallahan, 1999; Murphree et al., 2009), which in turn can help determine the ultimate effectiveness of their information campaigns (Avery & Kim, 2009). Zoch and Molleda (2006) categorized four functions of framing for public relations practices: (1) define problems or causation, (2) identify the source of the problem, (3) provide moral judgments about the situation causing the problem, and (4) propose solutions to the problem. Though traditionally scholars examined public relations subsidies such as media releases to identify how organizations framed themselves to the media, the digital age allows researchers to now identify how organizations frame their messages for the public.

Largely beginning with Iyengar's (1991) pioneering research on how the media frame poverty, crime, and employment, scholars have categorized specific types of frames used by the media and other organizations. Following this line of research, crisis communication scholars consistently have identified four general crisis frames organizations commonly use to help the public interpret crises: attribution of responsibility, conflict, economic consequences, and human interest (e.g., An & Gower, 2008; Choi & Gower, 2006; Semetko & Valkenburg, 2000). Additional, research identified seven disaster frames organizations can employ: anniversary/memorial, collaboration, human interest, leadership, seasonal, severity, and special event (Liu, 2009). Evaluating health crises, research also identified a conflict frame and added another four relevant frames: action, new evidence, reassurance, and uncertainty (Shih, Wijaya, & Brossard, 2008). Finally, evaluating health issues, researchers identified five frames: disease detection, disease prevention, healthcare services, lifestyle risk factors, and scientific discovery (Higgins, Naylor, Berry, O'Conner, & McLean, 2006; Umphrey, 2003). Fig. 2 synthesizes and further explains all of these frames.

Evaluating how, if at all, organizations employ these four primary categories of frames (*general crisis*, *disaster*, *health crisis*, and *general health issues*) is one indication of how they want their publics to interpret the 2009 pandemic flu crisis. In particular, given that the pandemic flu crisis occurred during a time when social media were becoming mainstream venues for issuing crisis responses (Sutter, 2009), we ask:

RQ2: Is there a difference in how organizations used *general crisis*, *disaster*, *health crisis*, and *general health issues* frames via their social and traditional media responses to the 2009 pandemic flu crisis?

The answer to this question indicates whether organization portrayed the 2009 pandemic flu crisis differently via traditional and social media given that social media provide a new, under-researched platform for communicating about crises.

2.3. Crisis communication practices by sector

Corporate and government organizations face different opportunities and constraints when managing public relations programs including crisis responses (Gelders, Bouckaert, & van Ruler, 2007; Liu, Horsley, & Levenshus, 2010). In terms of managing new media during crises, only one found study compared how corporate and government organizations address this challenge (Perry et al., 2003). In this seminal study, the researchers concluded that political and security considerations may affect whether government organizations incorporate new technology into their crisis responses. In addition, government organizations with missions to serve the public were more likely to implement new technology than government organizations that view crises as potential political embarrassments.

Along the same lines, Lee (2009) applied the government communication decision wheel (Liu & Horsley, 2007) to identify factors that uniquely affect how governments manage crises including: (1) questions about how effectively the crisis was prevented; (2) intensified media scrutiny; (3) analyzing the crisis response through the lens of past crisis responses; and (4) magnification of the government's bureaucratic nature. Adding to this list, crises create political opportunities such as policy windows for government organizations (e.g., Rosenthal & Kouzmin, 1997). Also, apologizing may have higher consequences in the corporate sector due to related financial repercussions associated with admitting guilt (e.g., Coombs, 2006). However, other scholars concluded that some of these factors apply to all organizations experiencing crises, especially intense media scrutiny and collective memory of past crises (e.g., Coombs, 2007).

Frame	Description
<i>General crisis frame options</i>	
attribution of responsibility	designates who is to blame for the crisis occurring
conflict	discusses crisis aspects that relate to dispute/tension between parties
economic consequences	focuses on negative or positive economic effects of the crisis
human interest	portrays crises by focusing on stories about individuals or communities
<i>Disaster frame options</i>	
anniversary/memorial	discusses an anniversary of a major crisis or referencing a major crisis
collaboration	emphasizes coordination among organizations responding to the crisis
human interest	see above definition
leadership	discusses an organization's major achievement/milestone in response to a crisis
seasonal	highlights holiday seasons or weather seasons
severity	emphasizes potential or actual damage caused by the crisis
special event	emphasizes special events that help publics better respond to the crisis
<i>Health crisis frame options</i>	
action	discusses any past or current organizations' crisis response actions
conflict	see above definition
new evidence	discusses discovery of new evidence that helps advance understanding of the crisis and/or the ability to quell the crisis
reassurance	messages instructing publics to not worry about the crisis by emphasizing readiness and/or successes of the organizations combating the crisis
uncertainty	discusses uncertainty in any aspect of the crisis including the cause, the cure, and the possible spread
<i>General health issues frame options</i>	
disease detection	discusses discovery of a disease's early signs and behaviors to ascertain how the disease is spreading
disease prevention	discusses behaviors to prevent the onset of a health problem and to minimize future risk
healthcare services	emphasizes the health system and/or health professionals' job actions
lifestyle risk factors	discusses any personal practices that affect individuals' likelihood of disease onset
scientific discovery	discusses discovery of new evidence that helps advance the understanding of a disease and how it is transmitted and/or spread

Fig. 2. Summary of organizational framing options.

More generally, limited research has explored important differences in how corporate and government organizations incorporate new technology into their public relations programs as a whole. For example, one study found that only 16% of Fortune 500 companies have a public facing blog (Barnes & Mattson, 2008). The same report found that corporations are more slowly adopting blogging compared to nonprofits. On the public sector side, the [Congressional Management Foundation \(2008\)](#) encouraged Congress to improve its online communication with citizens. Finally, a survey of corporate and government public relations practitioners found that practitioners frequently contribute to their organizations' Web sites, but infrequently blog on behalf of their organizations (Liu et al., 2010). Given these emerging differences between corporate and government communication practices, we ask:

RQ3: Is there a difference in how corporate and government organizations used *general crisis*, *disaster*, *health crisis*, and *general health issues* frames in their responses to the 2009 pandemic flu crisis?

The answer to this question helps indicate how corporate versus government organizations intended their publics to interpret the crisis.

3. Method

To investigate possible differences in framing the 2009 pandemic flu crisis among organizations and the media channels they used, this study quantitatively evaluated traditional and social media response documents distributed by 13 corporate and government organizations affected by the pandemic. For government organizations, we purposefully selected the Centers for Disease Control (CDC), Department of Health and Human Services (HHS), and the World Health Organization (WHO) because they are leading national and international government organizations responsible for responding to large-scale health crises.

For corporate organizations, we purposefully selected industry types that likely would respond to the crisis due to the financial impact of the pandemic: the airline, pharmaceutical, pork production, and food services-related industries. In addition, we selected the National Pork Producers Council (NPPC) and National Pork Board (NPB) to represent corporate responses because they are the leading industry voices for U.S. pork producers, who were severely financially impacted. We selected two corporations from each industry type based on Fortune 500 company industry index: (1) American Airlines and Continental Airlines for the airline industry because they had the most frequent direct flights from the U.S. to Mexico, where the crisis started; (2) Roche and GlaxoSmithKline (GSK) because they are the leading producers of flu antiviral medications and vaccinations; (3) Smithfield and Tyson Foods because they are the largest pork producers in the U.S.; and (4) McDonalds and Yum Brands because they are the largest food service providers in the U.S. This purposeful case selection approach provides rich cases with the necessary characteristics to answer our research questions and is an ideal quantitative sampling approach when there were a large number of cases for the phenomenon under investigation (Peterson, 2008). This approach however, limits the findings' generalizability.

3.1. Sampling procedure

All traditional and social media response documents released between April 23, 2009 and July 31, 2009 were retrieved from the organizations' official Web sites, Twitter feeds, and Facebook pages. For traditional media, all documents posted on the media relations section of organizations' websites were retrieved: fact sheets, media advisories, press releases, press conference briefings, reports, statements, and updates. For social media, documents retrieved were Facebook posts, Twitter posts, and organizations' documents linked to Facebook posts and Twitter posts (e.g., press release linked to a tweet). We selected Twitter and Facebook because they are the two primary social media outlets organizations used to respond to crises at the time the study was conducted (Sutter, 2009). A total of 2240 media materials released by the organizations from April 23, 2009 to July 31, 2009 were collected. Data collection started on April 23, 2009 because this is when the first organization in our study issued a response and ended data collection on July 31, 2009 because this is when the U.S. government said the H1N1 outbreak was dying down (Sternberg, 2009).

3.2. Variables measured

Emotions measured in our study were alert, anger, contempt/disgust, confusion, fear/anxiety, relief, sadness, shame, and sympathy/compassion and were defined based on previous literature (e.g., Choi & Lin, 2009; Coombs & Holladay, 2005; Jin, 2009). To examine framing in the 13 organizations' pandemic flu crisis responses, four general frames were operationally defined: (1) *general crisis*, (2) *disaster*, (3) *health crisis*, and (4) *general health issues* (see Fig. 2) based on previous literature (e.g., An & Gower, 2008; Choi & Gower, 2006; Liu, 2009; Semetko & Valkenburg, 2000; Shih et al., 2008). First, four indicators were employed for the *general crisis frame*: attribution of responsibility, conflict, economic consequences, and human interest with a total of nine items (An & Gower, 2008; Choi & Gower, 2006; Semetko & Valkenburg, 2000). For the attribution of responsibility indicator, we included two items considering the crisis's unique characteristics: messages about "the origin of the outbreak" and "attribution of responsibility for the crisis." For the economic consequence, five items were included: messages about "economic consequences in general," "pork consumption," "impact on stock prices," "effects on travel," and "other economic consequences." Conflict and human interest indicators included one item respectively: mentions about "conflict" or "human interest" (see Fig. 2 for the operational definitions).

Second, the *disaster frame* used seven indicators based on previous literature: anniversary/memorial, collaboration, human interest, leadership, seasonal, severity, and special event (Liu, 2009). Reflecting characteristics of the 2009 H1N1 pandemic crisis, we included two items for the severity indicator: messages about "severity of the crisis," and "the number of H1N1 flu infection or fatality." All other indicators were measured by mentions of messages about each indicator (see Fig. 2).

Third, action, conflict, new evidence, reassurance, and uncertainty indicators were included for the *health crisis frame* (Shih et al., 2008). Fourth, to measure the *general health issues frame*, five indicators were adopted from previous literature:

Table 1
Organizations' responses to the 2009 H1N1 pandemic.

Org	Total sample (n = 2240)				H1N1 Flu crisis responses (n = 745)		
	Traditional media	Social media	Total	Discuss H1N1 flu	Traditional media	Social media	Total
CDC	100 (31.7%)	215 (68.3%)	315 (100%)	206 (65.4%)	74 (35.9%)	132 (64%)	206 (100%)
HHS	64 (39.8%)	97 (60.2%)	161 (100%)	29 (18.0%)	13 (44.8%)	16 (55.2%)	29 (100%)
WHO	104 (21.5%)	380 (78.5%)	484 (100%)	316 (65.3%)	79 (25%)	237 (75%)	316 (100%)
AA	80 (15.6%)	434 (84.4%)	514 (100%)	10 (1.9%)	1 (10%)	9 (90%)	10 (100%)
Continental	21 (80.8%)	5 (19.2%)	26 (100%)	2 (7.7%)	2 (100%)	0 (0%)	2 (100%)
Roche	44 (14.5%)	260 (85.5%)	304 (100%)	45 (14.8%)	8 (17.8%)	37 (82.2%)	45 (100%)
GSK	34 (28.1%)	87 (71.9%)	121 (100%)	15 (12.4%)	7 (46.7%)	8 (53.3%)	15 (100%)
Smithfield	11 (100%)	0 (0%)	11 (100%)	7 (63.6%)	7 (100%)	0 (0%)	7 (100%)
Tyson	10 (90.9%)	1 (9.1%)	11 (100%)	2 (18.2%)	2 (100%)	0 (0%)	2 (100%)
McDonalds	5 (100%)	0 (0%)	5 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (100%)
Yumbrands	6 (50%)	6 (50%)	12 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (100%)
NPB	14 (20.3%)	55 (79.7%)	69 (100%)	44 (63.8%)	5 (11.4%)	39 (88.6%)	44 (100%)
NPPC	27 (3.2%)	178 (86.8%)	205 (100%)	69 (33.7%)	3 (18.8%)	56 (81.2%)	69 (100%)
Total	521 (23.3%)	1719 (76.7%)	2240 (100%)	745 (33.3%)	211 (28.3%)	534 (71.7%)	745 (100%)

disease detection, disease prevention, health care services, lifestyle risk factors, and scientific discovery frames (Higgins et al., 2006; Umphrey, 2003). Lastly, to see how the influenza was referenced in organizations' pandemic flu crisis responses, the mentions of "swine flu," "H1N1 flu," "Mexico flu," and "other names" were coded as present or absent along with frequency.

3.3. Coding procedure and data analysis

A coding protocol was developed to capture the variables under investigation with definitions and examples. All indicators for the variables were coded based on the dichotomy of the message's presence (i.e., 1 or 0) and the frequency of each indicator to minimize possible subjective decisions of coders. For frequency counts, one paragraph was designated as the unit of analysis for all indicators. For message presence, composite measures for the four frame types (*general crisis*, *disaster*, *health crisis*, and *general health issues*) and the emotion variable were created by summing up the score of each indicator (either 1 or 0) for data analyses other than Chi-square tests.

Two coders independently coded all response documents. Pre-tests were conducted to ensure validity and accuracy in the codebook. Initially the study's authors coded 0.4% ($n = 11$) of the response documents for a first-wave reliability check. Inter-coder reliability was assessed using Krippendorff's alpha (Hayes & Krippendorff, 2007). The first-wave reliability estimates were satisfactory and ranged from .71 to .80 using SPSS macros for Krippendorff's alpha. Next, 451 response documents (22%) were independently coded. In this second round of inter-coder reliability checks (following more training), the range of Krippendorff's alpha reliabilities improved and ranged from .77 to 1.0. Given that methodologists agree that reliability coefficients of .70 or greater are generally acceptable, especially for more conservative indices such as Krippendorff's alpha (Lombard, Snyder-Duch, & Bracken, 2002), inter-coder reliability was deemed strong and acceptable, and the remainder of the sample was coded.

4. Results

Before answering our research questions, we examined the frequency of responses via organization type and media channel to provide context for our research questions. Of a total of 2240 documents released by the organizations from April 23, 2009 to July 31, about 33% ($n = 745$) were related to the H1N1 pandemic flu. There were significant differences between organizations representing government and corporate interests in responding to the 2009 pandemic flu ($\chi^2(1, 2237) = 443.3$, $p < .000$). About 57% ($n = 551$) of the total government documents ($N = 960$) addressed the flu pandemic compared to only about 15% ($n = 194$) of the documents sent by organizations representing corporate interests ($N = 1278$). WHO ($n = 316$, 42%) was the most active in terms of frequency of pandemic flu crisis responses, followed by CDC ($n = 206$, 28%), NPPC ($n = 69$, 9.3%), Roche ($n = 45$, 6%), NPB ($n = 44$, 5.9%), HHS ($n = 29$, 3.8%), GSK ($n = 15$, 2%), AA ($n = 10$, 1.3%), Smithfield ($n = 7$, .9%), Continental ($n = 2$, .3%), and Tyson Foods ($n = 2$, .3%).

Regarding media channels used for distributing crisis responses, about 28% ($n = 211$) of the crisis responses were distributed via traditional media, while 72% ($n = 534$) were distributed via social media (see Table 1). In addition, government organizations in our sample disseminated significantly more crisis responses through both traditional ($n = 166$, 79%) and social media ($n = 385$, 72%) than organizations representing corporate interests ($\chi^2(1, 2237) = 443.3$, $p < .000$, $r = .45$). About 79% ($n = 166$) of the total traditional media crisis responses and 72% ($n = 385$) of the total social media crisis responses were disseminated by government organizations, whereas only 21% ($n = 45$) of the traditional media crisis responses and 28% ($n = 149$) of the social media crisis responses were distributed by organizations representing corporate interests. Only 6% ($n = 12$) of traditional media responses included links to social media, whereas 44% ($n = 233$) of social media responses included links to traditional media. In addition, when examining monthly changes (April–July) in how the influenza was referenced in organizations' crisis responses, frequency of using the term "swine flu" decreased significantly over time ($F(3,$

Table 2
Differences of addressing each emotion by 2009 H1N1 Pandemic Milestones.

	Confusion	Fear	Alert	Sympathy
Vaccine Development Starts (May 3, 2009)	$t(1, 744) = 4.66, p < .001^{***}$	$t(1, 744) = .48, p > .05$	$t(1, 744) = .08, p > .05$	$t(1, 744) = .17, p > .05$
Pre May 3	.92* (1.9)**	.09 (.35)	.15 (.52)	.03 (.16)
Post May 3	.37 (1.2)	.07 (.35)	.14 (.55)	.02 (.17)
WHO Pandemic Declaration (June, 11, 2009)	$t(1, 744) = 6.35, p < .001^{***}$	$t(1, 744) = 2.10, p < .05$	$t(1, 744) = -.99, p > .05$	$t(1, 744) = .39, p > .05$
Pre June 11	.62 (1.5)	.09 (.37)	.13 (.52)	.03 (.17)
Post June 11	.11 (.61)	.03 (.19)	.18 (.62)	.02 (.18)
Monthly Changes	$F(3, 742) = 12.2, p < .001^{***}$	$F(3, 742) = 1.8, p > .05$	$F(3, 742) = .53, p > .05$	$F(3, 742) = 1.2, p > .05$
April	1.1 (2.1)	.09 (.38)	.13 (.38)	.03 (.17)
May	.5 (1.3)	.09 (.36)	.14 (.58)	.02 (.15)
June	.2 (1.0)	.06 (.36)	.12 (.48)	.05 (.28)
July	.05 (.22)	.00 (.00)	.21 (.70)	.00 (.00)

* Means.

** Standard deviations.

*** Significant $p < .001$.

742) = 24.4, $p < .001$, $\eta^2 = .10$) whereas use of the term “H1N1 flu” significantly increased over time ($F(3, 742) = 8.15, p < .001$, $\eta^2 = .03$). This could be due to the results that pork producers (e.g., Smithfield) and their representatives (e.g., NPPC) actively urged media not to use the term swine flu by stating, for example, “much of the media referred to the influenza as ‘swine’ flu, even after U.S. and world agriculture and public health agencies said the H1N1 virus seen in people around the world never has been in pigs” (NPPC, 2009, May 8).

To explore how organizations incorporated emotions into their responses via social and traditional media (RQ1), a MANOVA was performed for both message presence and frequency. The results suggest that there were significant differences in incorporating emotions in the organizations’ H1N1 pandemic flu responses between traditional and social media (Wilks’ $\Lambda F(1, 744) = 42.62, p < .001$, $\eta^2 = .10$; $F(1, 744) = 82.2, p < .001$, $\eta^2 = .10$ for message presence; $F(1, 744) = 31.5, p < .001$, $\eta^2 = .04$ for message frequency). The mean score for the composite emotions measure was significantly higher for traditional media ($M = 1.3, SD = 1.5$ for message presence; $M = 2.8, SD = 4.6$ for frequency) than for social media ($M = .51, SD = .92$ for message presence; $M = 1.2, SD = 3.0$ for frequency). About 25% ($n = 183$) of the organizations’ H1N1 flu responses incorporated at least one emotion. The most frequently incorporated emotion was confusion: About 21% ($n = 154$) of the organizations’ H1N1 flu responses addressed confusion, followed by alert ($n = 71, 9.5\%$), fear ($n = 44, 6\%$), sympathy ($n = 16, 2.1\%$), relief ($n = 14, 2\%$), and sadness ($n = 4, .5\%$). There were no instances for three emotions: anger, contempt, and shame.

When looking at each emotion separately, the same tendency was found: Every emotion was incorporated more often in traditional than in social media. In addition, organizations representing corporate interests tended to address the publics’ emotional needs more actively than those representing governments (Wilks’ $\Lambda F(1, 744) = 27.2, p < .000$, $\eta^2 = .07$) due to pork producers actively incorporating confusion into their crisis responses (e.g., by stating that people cannot get the H1N1 from eating pork or pork products). More specifically, confusion was more often incorporated in corporations’ than government organizations’ responses ($F(1, 744) = 110.6, p < .001$, $\eta^2 = .13$ for the frequency of addressing confusion), whereas alert ($F(1, 744) = 5.79, p < .05$, $\eta^2 = .01$ for frequency) and sympathy ($F(1, 744) = 5.87, p < .05$, $\eta^2 = .01$ for frequency) were more often incorporated in government organizations’ responses. Out of 154 responses addressing confusion, about 62% ($n = 95$) were addressed by corporations while 38% ($n = 59$) were addressed by government organizations. However, 87% ($n = 62$) of the responses incorporating alert ($n = 71$) were from government organizations, whereas only 13% ($n = 9$) were from corporations. All crisis responses addressing sympathy were incorporated by government organizations ($n = 16, 2.1\%$).

In addition, when looking at differences in addressing emotions before and after the pandemic declaration by WHO (see Fig. 1 for H1N1 pandemic timeline), there were significant differences in addressing confusion ($t(1, 744) = 6.35, p < .001$, Cohen’s $d = .43$) and fear ($t(1, 744) = 2.10, p < .05$, Cohen’s $d = .2$), but no such differences for alert ($t(1, 744) = -.99, p > .05$, Cohen’s $d = -.09$) and sympathy ($t(1, 744) = .39, p > .05$, Cohen’s $d = .06$). Addressing confusion decreased over time as more H1N1 flu information was shared with publics. During April and May, pork producers actively addressed publics’ confusion especially about whether one can be infected with H1N1 flu through pork consumption (see Table 2). Addressing fear decreased after WHO declared a pandemic, but no significant differences were found in addressing sympathy and alert before and after WHO declared a pandemic. There were also no significant differences in addressing alert, fear, and sympathy before and after HHS announced vaccine development (May 03, 2009, see Fig. 1). In addition, there were no monthly differences in addressing alert ($F(3, 742) = .53, p > .05$, $\eta^2 = .002$), fear ($F(3, 742) = 1.8, p > .05$, $\eta^2 = .007$), and sympathy ($F(3, 742) = 1.2, p > .05$, $\eta^2 = .005$). In terms of addressing alert, fear, and sympathy, the first U.S. case of H1N1 flu in the U.S. (April), vaccine development announcement (May), and the pandemic declaration by WHO (June) did not seem to statistically affect the frequency of addressing such emotions (see Table 2).

To answer RQ2 (framing differences between social and traditional media) and RQ3 (framing differences between corporate and government organizations), we created composite measures for the four frames (see Fig. 2). First, there were significant differences in how organizations framed the H1N1 pandemic flu via their social and traditional media responses

Table 3
Means and standard deviations of frames by organizations and media channels.

	General crisis frame	Disaster frame	Health crisis frame	General health issues frame
Presence*	$F=5.78, p<.001$	$F=41.8, p<.001$	$F=1.2, p>.05$	$F=17.9, p<.001$
Government	.038 (.09)***	.18 (.16)	.15 (.20)	.10 (.18)
Corporation	.11 (.14)	.09 (.13)	.16 (.16)	.04 (.13)
Frequency**	$F=54.9, p<.001$	$F=40.5, p<.001$	$F=2.28, p>.05$	$F=7.43, p<.01$
Government	.06 (.16)	.39 (.44)	.35 (.68)	.22 (.58)
Corporation	.23 (.46)	.17 (.29)	.43 (.62)	.09 (.44)
Presence	$F=1.58, p>.05$	$F=89.6, p<.001$	$F=102.8, p<.001$	$F=44.1, p<.001$
Traditional media	.06 (.12)	.24 (.18)	.26 (.25)	.15 (.20)
Social media	.05 (.10)	.12 (.13)	.11 (.15)	.06 (.14)
Frequency	$F=.68, p>.05$	$F=42.2, p<.001$	$F=99.5, p<.001$	$F=5.5, p<.05$
Traditional media	.12 (.32)	.49 (.44)	.73 (.98)	.26 (.44)
Social media	.10 (.26)	.28 (.39)	.22 (.40)	.16 (.55)

* The presence of indicators for the frames.

** The frequency of indicators for the frames.

*** The numbers in parentheses indicate standard deviations.

(Wilks' $\Lambda F(1, 744)=35.2, p<.001, \eta^2=.20$). When framing the crisis using *disaster*, *health crisis*, and *general health issues* frames, traditional media revealed significantly higher mean scores than social media (see Table 3). However, there were no differences in using the *general crisis* frame via traditional and social media responses. In other words, when framing the H1N1 flu crisis as a *general crisis*, organizations tended to use social media as much as they used traditional media.

Among the four frame categories, organizations framed the H1N1 flu crisis most frequently using *disaster* ($M=.16, SD=.19$) and *health crisis* ($M=.15, SD=.19$) frames than using *general crisis* ($M=.05, SD=.11$) and *general health issues* ($M=.09, SD=.17$) frames. As to RQ3, there were significant differences in how organizations used the different frames (Wilks' $\Lambda F(1, 744)=37.7, p<.001, \eta^2=.17$). More specifically, there were significant organizational differences in using the *general crisis*, *disaster*, and *general health issues* frames, but no significant differences in using the *health crisis* frame (see Table 3). Government organizations used the *disaster* frame more often in their crisis responses than corporate organizations ($F(1, 744)=41.8, p<.001, \eta^2=.05$), whereas corporate organizations used the *general crisis* frame more often than government organizations ($F(1, 744)=57.8, p<.001, \eta^2=.07$). In addition, government organizations used the *general health issues* frame more often than did corporate organizations ($F(1, 744)=17.9, p<.001, \eta^2=.03$). However, all the organizations heavily relied on the *health crisis* frame, indicating no differences in employing this frame ($F(1, 744)=1.2, p>.05, \eta^2=.002$).

When looking at each frame in more detail, our results revealed that the severity and seasonal indicators for the *disaster* frame were significantly more often addressed by government organizations than corporate organizations, resulting in predominant adoption of the *disaster* frame by government organizations (severity: $F(1, 744)=80.1, p<.001, \eta^2=.10$); seasonal: $F(1, 744)=6.8, p<.01, \eta^2=.01$). As to the *general health issues* frame, disease prevention ($F(1, 744)=6.9, p<.01, \eta^2=.01$), health care services ($F(1, 744)=8.0, p<.01, \eta^2=.011$), and lifestyle risk indicators ($F(1, 744)=5.9, p<.05, \eta^2=.01$) were more often employed by government organizations than corporate organizations. However, all indicators of the *general crisis* frame were more often adopted by corporate organizations than by government organizations (attribution of responsibility factor: $F(1, 744)=18.6, p<.001, \eta^2=.03$); economic consequences: ($F(1, 744)=47.2, p<.001, \eta^2=.06$); conflict: ($F(1, 744)=13.3, p<.001, \eta^2=.02$); human interest ($F(1, 744)=7.7, p<.01, \eta^2=.01$). Finally, even though all organizations equally adopted the health crisis frame regardless of organization type as explained above, the uncertainty indicator ($F(1, 744)=5.9, p<.01, \eta^2=.01$) was more often adopted by government organizations whereas reassurance ($F(1, 744)=23.3, p<.001, \eta^2=.03$) and conflict indicators ($F(1, 744)=13.3, p<.001, \eta^2=.02$) were more often employed by corporate organizations.

When examining industry differences, pork producers, NPPC/NPB, and airline carriers were more active in using the *general crisis* frame than government or pharmaceutical organizations ($F(4, 741)=41.7, p<.001, \eta^2=.20$). In using the *disaster* and *general health issues* frames, government organizations were more active than all other organizations ($F(4, 741)=10.9, p<.001, \eta^2=.06$ for the *disaster* frame; $F(4, 741)=6.0, p<.001, \eta^2=.02$ for the *general health issues* frame).

There were also significant interaction effects between organizations and the media channels they used for the *disaster* ($F(3, 742)=4.0, p<.05, \eta^2=.01$) and *general health issues* frames ($F(3, 742)=6.13, p<.05, \eta^2=.02$). In employing the *disaster* frame, even though government organizations were more active in using both social and traditional media, they more heavily relied on traditional media than on social media compared to corporate organizations. In using the *general health issues* frame, government organizations significantly relied more on traditional media, whereas corporate organizations revealed no differences in using traditional and social media. However, government organizations used both traditional and social media a lot more frequently than corporate organizations when framing the pandemic flu crisis as a *general health issue*.

5. Discussion

We now discuss the study's findings and implications, concluding with a discussion of the study's limitations and directions for future research.

5.1. 2009 H1N1 pandemic and social media

Experts heralded the 2009 H1N1 pandemic as benchmark for effectively using social media to respond to crises (e.g., Smith, 2009; Sutter, 2009). Yet, the organizations in our sample tended to heavily rely on traditional media to frame the crisis. Only when framing the pandemic as a *general crisis* did organizations tend to equally rely on social and traditional media; for all other frames (*disaster*, *health crisis*, and *general health issues*) organizations more frequently relied on traditional media. This may be because at the time the study was conducted organizations were just beginning to develop formal policies for how to use social media. For example, in July 2009 the Department of Health and Human Services posted its first draft social media guidelines (“HHS general guidance,” n.d.). Therefore, without formal policies to guide social media responses, communicators might have been restricted in their ability to craft unique frames and messages to release via social media during the crisis. This may have been particularly true for government organizations that generally are subject to more legal and policy constraints (Liu et al., 2010).

In addition, across all the organizations' social media responses in our sample, the links present in these responses frequently lead to traditional media documents: about 44% of the total social media responses included links to traditional media. The converse, however, was not true: The majority of traditional media responses did not include any information about organizations' social media responses activities. These results suggest that by more fully incorporating social media into traditional media, organizations may better facilitate active information flow across their message platforms. This lack of synergy may have been due to the lack of formal social media guidelines when the pandemic occurred. For example, a survey conducted in May 2009 found that only 29% of U.S. companies have formal social media policies (eMarketer, 2010). Therefore, the study's findings can help communicators document missed opportunities for educating publics about H1N1 via social media, which may contribute to making the business case for adopting formal social media policies.

5.2. 2009 H1N1 pandemic and addressing emotions

In terms of how the organizations incorporated emotions into their responses via social and traditional media we found a significant difference: Overall organizations more fully incorporated emotions into their traditional than into their social media responses. Also, the most frequently included emotions across all media types were confusion, alert, fear, sympathy, and sadness. Interestingly, corporate organizations in our sample more frequently incorporated confusion into their responses and government organizations more frequently incorporated alert and sympathy. Indeed, all instances of sympathy occurred in responses issued by government organizations. Given that publics seek out social media because they uniquely provide emotional support during crises (e.g., Choi & Lin, 2009; Kaye, 2005), organizations might have better met publics' emotional needs through more thoroughly using social media to engage in dialogue with publics instead of predominantly communicating through traditional media. Therefore, these findings point to a second missed opportunity which may also help strengthen the business case for adopting formal social media policies before the next global health crisis.

Also, by primarily using traditional media to communicate emotional responses, organizations in our study heavily relied on journalists to translate these responses to their publics. We recommend that crisis managers facing large-scale crises in the future better balance the amount of emotional information they distribute via traditional and social media, especially given that journalists are inclined to focus on organizations' actions and consequences rather than emotions (Bennett, 2001; Liu, 2009; Shih et al., 2008) and publics specifically seek out social media for emotional needs during crises (e.g., Choi & Lin, 2009; Kaye, 2005).

When looking at differences in addressing emotions before and after key milestones such as in April when the first U.S. case of H1N1 was reported, in May when HHS announced vaccine development, and in June when WHO declared a pandemic, some notable differences emerged. For example, there were significant differences in addressing confusion and fear before and after the pandemic declaration. Addressing confusion and fear decreased significantly after the pandemic declaration. In addition, addressing confusion decreased over time when looking at monthly milestones from April to July as more H1N1 flu information was shared with publics. This decrease trend was also shown in addressing fear, though not statistically significant. For alert and sympathy, the same milestones also did not have a statistically significant effect on the frequency of addressing these emotions. Overall, these findings indicate that the organizations in our sample did not actively attempt to decrease or increase addressing publics' emotional needs around the crisis' milestones with the exception of confusion. If the organizations had employed more or less emotions relevant to each milestone, they potentially could have generated desirable health behaviors from publics more efficiently (e.g., Cummings, 2009; Leslie, 2006).

5.3. 2009 H1N1 pandemic flu frames

Organizations in our sample used *disaster*, *health crisis*, and *general health issues* frames more frequently via traditional than social media and this difference was significant. There were no differences in how the organizations used the *general crisis frame* via traditional and social media. These findings reveal that whether consciously or not organizations employed a much greater variety of frames via their traditional than social media, indicating that they relied on traditional media to provide a more comprehensive response. Importantly, these findings reveal that the social media responses included less information about important health behaviors such as disease prevention and detection, potentially indicating that organizations in our sample viewed traditional media as more effective for educational messages. Yet, publics increasingly

use social media to obtain health information. For example, 80% of online Americans use the Internet for health information (Fox, 2006). Social networking sites like Twitter are particularly useful for obtaining real-time health information (Scanfeld, Scanfeld, & Larson, 2010). Therefore, organizations may have missed a valuable opportunity to help educate publics about appropriate health behaviors by predominately emphasizing *health information* and *health crisis* frames via their traditional rather than social media responses.

In terms of organization type, several interesting findings emerged. First, all organizations in our sample most frequently used the *health crisis frame* with no significant differences. Given that the H1N1 crisis was a health crisis, it is not surprising that organizations emphasized this frame. However, we argue that the organizations could have better prepared publics if they prioritized the *health issue frame*. This frame provides necessary facts to help publics effectively respond to crises (e.g., disease prevention/detection behaviors and lifestyle risk factors). Thus, framing the pandemic as a *general health issue*, rather than a *health crisis*, may have encouraged the public to better prepare for the crisis. This is important because, for example, as of October 2009, only 40% of the U.S. public said they were absolutely certain they would get the H1N1 vaccine when it became available (Blendon, SteeleFisher, Benson, Weldon, & Herrmann, 2009). Another implication of this finding is that by framing H1N1 as a crisis rather than a health issue, organizations may have missed an opportunity to encourage long-term health behaviors such as behaviors that can prevent the onset of a health problem applicable beyond H1N1. Crisis communication scholars have begun calling for more research on post-crisis communication outcomes (e.g., Seeger, Padgett, & Donayle, 2010). This study suggests that such research would be particularly valuable for helping health communicators better understand how to craft messages that take advantage of the media spotlight during crises to foster long-term healthy behaviors.

Furthermore, government organizations in our sample were more likely than their corporate counterparts to frame the H1N1 pandemic using the *general health issues* and *disaster* frames. Conversely, corporate organizations tended to frame the pandemic as a *general crisis* and all these differences were significant. These results reflect that organizations framed the H1N1 pandemic based on their primary communications goals, which would be expected. As Liu and Horsley (2007) noted the primary goal of corporate communication is to generate a profit, whereas the primary goal of government communication is to provide for the public good. Leading crisis communication scholars, however, have noted that all organizations experiencing crises must disseminate empathetic communication to foster trust and motivate publics to take positive actions (e.g., Coombs, 2007; Seeger et al., 2003). Coombs (2007) further noted that this empathetic communication also benefits organizations because publics are more likely to trust organizations that meet their basic needs during a crisis. Therefore, when corporations respond to large-scale crises, such as the 2009 H1N1 pandemic, they may want to consider balancing reputation management messages with messages to help publics make sense of the crisis, thereby potentially building better long-term organization-public relationships.

Finally, examining how government and corporate organizations used each frame in greater detail reveals several significant findings. First, government organizations more often incorporated the severity and seasonal indicators from the *disaster* frame into their responses than did corporate organizations. Emphasizing severity and the seasonal timing of a crisis is particularly important to encourage media coverage of disasters – and thereby increase the reach of crisis messages – as these two indicators are frequently used by media when framing disasters (Liu, 2009). However, as already noted, if organizations had balanced the use of these frames with the health issues frame they may have been able to more positively influence long-term health behaviors. Also, even though all organizations equally adopted the health crisis frame, government organizations more frequently adopted the uncertainty indicator whereas corporate organizations more often adopted the reassurance and conflict indicators. Given that confusion was more often addressed by corporate than government organizations in our study, this particular finding seems to support previous literature suggesting that if organizations accept the uncertainty inherent in any crisis they are more likely to be able to limit confusion internally and externally (Seeger et al., 2003). In other words, since government organizations were more likely to accept the uncertainty inherent in the H1N1 crisis, they may have tended to address less confusion in their responses than corporate organizations.

6. Future research and conclusions

Our findings provide several significant insights for future studies examining crisis responses. An influenza pandemic is a prolonged crisis during which communication strategies will change depending upon the pandemic phase (Reynolds & Quinn, 2009). Little research, examines such prolonged crises (DeVries & Fitzpatrick, 2006). Thus, more research is needed to examine crises that last months rather than days or weeks to help communicators determine how to adapt their response strategies and tactics over time. In addition, applying both issue-specific frames (e.g., *health crisis* frames) and more generic frames (e.g., *disaster* frames) to analyze crisis responses provides a more comprehensive understanding of how organizations differently approach crisis management. Applying the two broad categories of frames is rare in framing research (Matthes, 2009) and we suggest that future crisis framing research would benefit from expanding the categories of frames applied.

Furthermore, we recommend that researchers continue to examine how, if at all, new communication technologies affect crisis management practices especially given the relative dearth of empirical research on this topic. In particular, investigating how publics process crisis messages via traditional and social media would be especially valuable given that publics process crisis messages differently on and offline (e.g., Choi & Lin, 2009; Sweester & Metzgar, 2007) and psychological, cultural, and social factors affect perceptions of risk (Heath, Lee, & Ni, 2009). Studies focusing on how publics process health crisis messages are especially important for examining whether extensive media coverage of health crises affects long-term health behaviors

and, if so, how organizations can best frame their crisis messages to encourage healthy behaviors. In addition, future studies should examine how interpersonal communication such as school presentations and word-of-mouth communication such as sharing crisis information among friends affects how publics respond to crisis information. As indicated in the blog-mediated crisis communication model, crisis information is shared and transformed through traditional, social, and word-of-mouth communication (Jin & Liu, 2010). Finally, as more state and local government organizations adopt social media, investigating how these different levels of government frame and respond to a large-scale crisis would provide additional information about the complexities of multi-level government responses to health crises (e.g., Meng & Berger, 2008).

We acknowledge that our study is not without limitations. In particular, the study focused on responses to the 2009 flu pandemic primarily in the U.S. Therefore, the study's findings cannot be generalized outside of the U.S. In addition, the findings only apply to the organizations we examined and thus also cannot be generalized to all organizations that responded to the pandemic. Finally, through taking a deductive approach to framing analysis, it is possible the study overlooked frames the organizations used, which future inductive research could identify.

As a snapshot into a global pandemic, our study highlights how organizations predominately relied on traditional rather than social media to frame the crisis. For communication managers, our findings indicate a need to better educate their organizational leadership about the potential benefits of more fully integrating social media into crisis responses. Our study can help communication managers highlight potential missed opportunities from not fully embracing social media's unique benefits and empirically demonstrate how when responding to a large-scale health crisis organizations employed social media differently from traditional media. These finding should help communication managers make the business case for more fully integrating social media into crisis communication, which is valuable given that many communicators are unclear about how to make the business case for social media (Hathi, 2009). With additional research, academics and communication managers can work together to improve understanding of how to best utilize traditional and social media to educate the public about issues and crises.

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