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Being First, Being Right, and Being Credible Since 2002: A Systematic Review of Crisis and Emergency Risk Communication (CERC) Research

Ann Neville Miller¹, Chad Collins¹, Lindsay Neuberger¹, Andrew Todd², Timothy L. Sellnow¹, and Laura Boutemen¹

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ABSTRACT

The crisis and emergency risk communication (CERC) model is a five-stage theory that merges established public health practices with principles of crisis communication. Although CERC has been regularly applied on the ground, it has been criticized as lacking the coherence and unity necessary to serve as a framework for research. To determine the extent and type of research CERC has generated since its original presentation to the academic community 15 years ago, we conducted a systematic review of research using CERC as a theoretical lens. A total of 4,471 articles in 20 languages were screened, 400 full texts examined, and 19 articles included in the research and theory analysis, of which one tested tenets of the CERC model. We conclude that CERC has rarely been theoretically tested, and we argue that reformulation of the propositions is necessary for empirical support of the model to proceed.

KEYWORDS: crisis and emergency risk communication, CERC, crisis communication theory, systematic review

The crisis and emergency risk communication (CERC) model (Reynolds & Seeger, 2005) is a five-stage theory that merges established public health practices with principles of crisis communication (Sellnow & Seeger, 2013). Developed by the Centers
for Disease Control and Prevention (CDC), CERC was part of a comprehensive effort to build capacity for crisis response among public health agencies (Veil et al., 2008). Within five years after the first CERC manual was published in 2002, the CDC had provided training to over 100,000 public health professionals through web-based and CD-ROM delivery as well as in face-to-face classrooms across the United States. The principles of CERC have been leveraged repeatedly to address such varied public health crises as Ebola (Kieh et al., 2017), bird flu (Vos & Buckner, 2016), depleted uranium exposure (Cicognani & Zani, 2015), winter storms (Rice & Spence, 2016), and chemical spills (Thomas et al., 2016).

Although CERC has been regularly applied on the ground, it has been criticized as lacking the coherence and unity necessary to serve as a framework for research (Veil et al., 2008; Sellnow & Seeger, 2013). Indeed, Reynolds and Seeger’s (2005) original publication of CERC for academic audiences was not designed to be a presentation of theory, but a call to attend to a new type of communication need. Veil et al. subsequently attempted to provide a roadmap for empirical investigation of CERC, but we argue that their six propositions are actually underlying assumptions and are not readily testable. Although CERC itself is derived from grounded theory and situated within an extensive body of public health and crisis communication literature, the propositions need revision in order to be heuristically provocative. To our knowledge, no systematic investigation of research related to CERC has been undertaken since its inception. Thus, the degree to which it has, or has not, spawned research and furthered knowledge is not known. The purpose of the current study was to determine the extent and type of research CERC has generated since its original presentation to the academic community 15 years ago (Reynolds & Seeger, 2005), and on the basis of those findings propose directions for theory advancement.

**Literature Review**

**Features of the CERC Model**

In their original presentation of CERC, Reynolds and Seeger (2005) merged two mature but distinct areas of communication
research: risk and crisis communication. They described risk communication as a field typically involving messages about negative consequences of unhealthy behaviors, principally persuasive in nature, characterized by long-term and routine communication, and closely grounded in scholarship on fear appeals and behavior change. The impetus for risk communication messages is current scientific knowledge about a risk factor, knowledge that health communicators attempt to convey to affected publics. Crisis communication, in contrast, is usually associated with public relations; addresses events such as employee violence, toxic spills, or organizational crises; is short-term and primarily informative; and usually gives rise to broad public interest and media coverage, much of which may involve probing and even hostile questions about culpability. The catalyst for crisis communication is a current situation or event, and messaging may be just as much about disclosing what is unknown as what is known. Reynolds and Seeger argued that crisis and emergency risk communication was a new hybrid form of messaging that health-care agencies could not afford to ignore, and that CERC provided a comprehensive approach to emergency public health events.

CERC adopts a crisis development, or stage model, approach. Like stage models addressing disaster management (e.g., Fink, 1986; Turner, 1967, it attempts to aid practitioners with sense-making by identifying a series of discrete phases of the unfolding of a crisis, irrespective of crisis type (Sellnow & Seeger, 2013). That is, stage models define events that are by nature chaotic and difficult to interpret.

The distinctives of CERC are its division of public health crises into five stages and identification of communication strategies to implement at each point for effective response (Reynolds & Seeger, 2005). The five stages are: (1) pre-crisis, (2) initial event, (3) maintenance, (4) resolution, and (5) evaluation (Reynolds & Seeger, 2005). During the pre-crisis stage, a potential threat is detected, and communication activities focus on risk messages such as urging publics to prepare in case the identified threat evolves into a crisis event. The initial event involves the onset of a crisis and requires the dissemination of messages to reduce uncertainty, promote reassurance, and foster self-efficacy among the public and
individuals affected by the crisis. Maintenance corresponds to the stage when the crisis unfolds, and messages serve a similar purpose as in the initial event stage, but they should provide more information about the crisis and correct any misperceptions held by the public. Resolution refers to the end of the crisis event. During this stage, communication to the public and affected individuals addresses restoration and rebuilding, but also honestly reports findings about factors that caused the crisis. Finally, the evaluation stage allows practitioners to reflect on the circumstances of the crisis and discuss lessons learned. This stage includes assessment of the communication activities that were undertaken before, during, and after the crisis (Reynolds & Seeger, 2005).

CERC has been presented to practitioners in a series of manuals published by the U.S. Department of Health and Human Services. Guidance in these publications is encapsulated in six principles (US Department of Health and Human Services [HHS] and CDC, 2018):

1. be first (communicating information quickly is crucial);
2. be right (information can include what is known, what is not known, and what is being done to fill in the gaps);
3. be credible (honesty and truthfulness should not be compromised);
4. express empathy (acknowledge people’s challenges and suffering in words);
5. promote action (giving people meaningful things to do calms anxiety and promotes self-efficacy); and
6. show respect (respectful communication engenders cooperation and rapport).

Like most stage models, CERC was generated from grounded theory, based on the experiences of myriad scholars and health communicators over several decades. Originating as it did from the practitioner-centric CDC, CERC was intended to be used by health communicators and emergency response personnel on the ground, and tested, if at all, in applied research. This applied orientation of CERC has been noted as one of its strengths (Elledge et al., 2008; Sellnow & Seeger, 2013). Indeed, some scholars of crisis
communication have argued that the primary objective of theorizing should be to work with practitioners to protect stakeholders from harm (Anthony & Sellnow, 2011). Such “practical theory” should be “judged by whether it informed patterns of practice that made life better” (Barge & Craig, 2009, p. 70). By this measure, CERC has been successful.

**Weaknesses of CERC as Theory**

Reynolds and Seeger’s (2005) original article made no claim to theory status. Although they firmly grounded the new form of messaging in literature, the authors neither laid out propositions nor made testable predictions regarding how adherence to CERC principles by health communicators was likely to impact target audiences. Ultimately, the overarching nature of the model left it open to critiques of overgeneralization even as it made an efficient tool for training public health professionals. It shares the general weaknesses of stage models that pinpointing with certainty the stage in which one is operating at the time is approximate, extended crises may cycle through stages more than once, and different populations may experience stages at different points in time. CERC has also been specifically criticized for the inability to accommodate events with long maintenance stages (Sellnow & Seeger, 2013). The COVID-19 pandemic is a case in point. The model provides no explicit guidance for shifting communication needs during a global maintenance phase that is months-long in duration.

In response to this sort of criticism, Veil et al. (2008) published a theory piece about CERC 3 years after Reynolds and Seeger’s (2005) original article. They traced the roots of the model in literature on sensemaking and self-efficacy and advanced the following six propositions to be used as a basis for additional validation through future research:

1. risk and crisis are equivocal and uncertain conditions that create specific informational needs and deficiencies;
2. ongoing, two-way communication activities are necessary for the public, agencies, and other stakeholders to make sense of uncertain and equivocal situations and make
choices about how to manage and reduce the threat to their health;
3. communication processes will change dramatically as a risk evolves through the phases of a crisis, introducing new risks as a crisis evolves to post-crisis and recovery;
4. risk communication messages communicated before a crisis influence perceptions, expectations, and behavior after the crisis erupts. In turn, these crisis responses influence subsequent risk messages;
5. communication is consequential to specific risk and crisis management outcomes by promoting self-efficacy, and
6. risks and crises affect a wide variety of publics with variable needs, interests, and resources which in turn affects their communication capacities, needs, and activities.

The first three propositions emphasize the central, bi-directional, and evolving role of communication in the comprehensive response to crises and emergencies. The remaining propositions stress the importance of considering pre-crisis risk communication (proposition 4), audience self-efficacy (proposition 5), and the diversity of the CERC audiences (proposition 6). Veil et al. (2008) purposed to provide a roadmap for empirical investigation of CERC, however, their propositions, although insightful, serve more to clarify underlying assumptions of the model rather than providing theoretical tenets. Their propositions are either not testable (proposition 1), or not specific enough to generate hypotheses (propositions 2, 3, 4, 5, 6). Vague phrases like “two-way communication,” “other stakeholders,” “communication processes,” “change dramatically,” “communication capacities, needs, and activities,” “consequential,” and “informational needs and deficiencies” cannot be operationalized without extrapolation. Additionally, proposition 3 employs different terms for crisis phases than those presented in the model. Finally, the six principles of emergency and risk communication central to the model as propounded by the CDC—be first, be right, be credible, express empathy, promote action, show respect—are nowhere mentioned.

As a collective expression of the parameters of CERC, the six propositions also fall short of several of the criteria required of
good theory: predictive power, heuristic provocativeness, and organizing power (Berger & Chaffee, 1988). Given that the constructs are vague and difficult to operationalize, they have little predictive power. Logical connections between the separate propositions are not articulated and, as a result, they do not provide a coherent structure by which scientific knowledge can be organized. The combination of these factors is likely to cause the theory to be low in heuristic provocativeness; that is, in generating further research and theory building.

In summary, although CERC is theoretically grounded, both in extensive literature and practitioner experience, it does not appear amendable to empirical testing. If we are correct, little research based on CERC should exist. If, however, Veil et al.’s (2008) propositions have fulfilled their purpose, a systematic pattern of research testing the propositions should be available. In order to determine whether CERC has served as a springboard for empirical research, we posed the following research questions:

**RQ1:** What type of research has been conducted on CERC?

**RQ2:** To what extent do systematic research programs associated with CERC exist?

**RQ3:** To what extent have propositions of the model been tested?

**Method**

To answer these questions, we conducted a systematic review of literature. Following Levac et al. (2010), all aspects of the process were iterative and collaborative. Our team consisted of trained undergraduate and graduate students; three researchers with a research focus on risk, crisis, and health communication; and a university librarian.

The systematic review took place in two phases: (1) knowledge mapping to identify primary studies and grey literature reports that map against the research question and make clear the disciplinary and geographical spread of evidence (Clapton et al., 2009); and (2) examination of methodological and theoretical issues for research reports in which CERC served as a key theoretical lens, with particular attention to Veil et al.’s (2008) six propositions.
**Data Sources**

Literature review for the knowledge map included searches in 22 academic and grey literature databases between late September and early November 2017. Academic databases searched were: ABI Inform, Academic Search Premier, Applied Social Sciences Indexes and Abstracts (ASSIA), Business Source Premier, CINAHL, Cochrane Central Registry of Controlled Trials, Cochrane Database of Systematic Reviews, Communication and Mass Media Complete (EBSCOhost), ERIC, MEDLINE, PAIS, PsycInfo, Science Direct, Sociological Abstracts, Springer Link, and Web of Science (SSCI, A & HCl, CPCI-S, BKCI-S, CKSI-SSH, ESCI, CCR databases). In order to ensure broad inclusion of diverse research and locate literature from low- and middle-income countries, we did not restrict the search to specific languages. We also searched Google Scholar and Communication Initiative to identify both academic and grey literature. Additionally, we searched databases in Russian (Russian Science Citation Index), Korean (Korean Journal Database), and Spanish (SciELO; LILACS) which were searchable with English search terms. Altogether records were identified in 19 languages in addition to English (Arabic, 1; Bosnian, 1; Bulgarian, 1; Catalan, 1; Chinese, 7; Croatian, 1; Czech, 3; Dutch, 1; Estonian, 2; French, 5; Finnish, 1; German, 6; Italian, 6; Korean, 11; Lithuanian, 2; Norwegian, 1; Persian, 1; Polish, 1; Portuguese, 10; Romanian, 3; Russian, 1; Spanish, 15; Swedish, 2; Turkish, 2; Ukranian, 2). The date range searched was between 2002 and 2017.

**Electronic Search Strategies**

Using a Boolean approach, we searched three realms of subjects in the literature: (1) CERC-related terms, (2) general disaster terminology, and (3) specific crises/disasters/emergencies. Search strategies and terms were tailored for each database with reference to database thesauruses. The majority of databases allowed the terms “Crisis and Emergency Risk Communication” and CERC to be searched both as keywords and as text words to capture those phrases within the entire document text. Additionally, we searched both broad crisis terms and terms related to specific crisis events both as keywords and text words. We allowed selected MeSH (Medical Subject Headings) to be “exploded” to locate additional
synonyms and related terms. Grey literature, such as published reports on governmental and nongovernmental websites, was also searched. Table 1 provides a list of search terms. Specific search terms and strategies applied to each database can be obtained from the first author.

Ancestry and forward citation searching were performed on all identified highly relevant articles. To ensure that no articles remained uncaptured, additional subject headings and keywords were derived from articles found through ancestry and forward citation searching. Searches were then re-run including new keywords and subject terms in all databases. A total of 4,471 records were retrieved.

**TABLE 1  Search Terms Used**

<table>
<thead>
<tr>
<th>Category of Search Term</th>
<th>Search Terms Used</th>
</tr>
</thead>
</table>
Study Screening Method

The article selection process took place in several stages as displayed via a PRISMA flow diagram in Figure 1. After duplicates were removed and articles were title screened by two team members working independently, 1,184 distinct records remained. (For ambiguous cases, decisions were made through discussion to consensus.) Full texts of all these documents were judged for relevance by two team members, with full texts for six articles not located. After examination, 778 full texts were excluded because they did not meet inclusion and exclusion criteria (see below). The remaining 400 articles were selected for extraction of key findings for the knowledge map in phase 1. Papers that included original research reports (e.g., not opinion pieces or general essays) in which CERC was identified as playing a central role were analyzed in phase 2.

Inclusion and Exclusion Criteria

Articles were considered to satisfy inclusion criteria if they mentioned “Crisis and Emergency Risk Communication” and/or CERC specifically in the main text of the document. Articles in which CERC was an abbreviation for something other than Crisis and Emergency Risk Communication, or in which CERC or Crisis and Emergency Risk Communication or Crisis Emergency and Risk Communication was mentioned only in a footnote, appendix, or references list were excluded.

Data Extraction

After the research team jointly developed and tested a coding scheme, each article was coded for key descriptive characteristics by two team members working individually. Disagreements in coding were resolved by senior members of the research team. The following categories were coded: field of inquiry of first author; nationality of the first author’s institution or organization; nation the article was about; type of document (i.e., research article, essay, descriptive case study, or other); crisis type (i.e., bioterrorism, terrorism, drought, earthquake, flood, infectious diseases, nuclear, radiological or chemical incidents, weather-related crises like tornados and hurricanes, wildfires, general crisis, or other articles); and whether CERC was a central focus of the article.
FIGURE 1  PRISMA flow diagram of selection process. Flow of the article selection process from database search to full text examination (Moher et al., 2009).
In the second phase of analysis, research articles in which CERC was identified as playing a central role were subjected to more in-depth examination of methodological and theoretical characteristics. Documents were coded in line with the SPICE framework for question formulation (Booth, 2006): setting (nation; captured in phase I), perspective (sample identity and size, e.g., general population, first responders, county health officers), type of intervention (media channel; crisis phase), comparison (comparison group or not; captured in research method), evaluation (research method used, i.e., experiment, cross-sectional survey, longitudinal survey, focus groups, qualitative interviews, content analysis, observation, simulation, other). Narrative literature reviews were not counted as research. We also coded whether the research was funded (and if so by whom) and whether any of Veil et al’s (2008) six propositions were empirically tested.

**Results**

**Phase 1: Key Characteristics of Identified Documents**

Key descriptive characteristics of the studies are presented in Table 2. The two fields in which CERC was most frequently applied were the fields of the respective authors of its first formal introduction: public health (Reynolds) and communication (Seeger). It has also been used with some frequency in emergency management, medicine and nursing, and business. Nearly two-thirds of first authors were located at North American institutions, and the bulk of the remainder were at European institutions. A few authors at Asian institutions have written about the model, but authors from the Pacific, Latin America/Caribbean, and especially African regions were rare. Similarly, the largest numbers of specific crises studied took place in North America, followed by Europe. A substantial portion of the articles were location-generic, that is, they discussed broad principles of crisis and risk communication.

Regarding the type of crisis to which the CERC model has been applied, nearly half of articles identified were crisis general. Of those that addressed specific types of crises, by far the most common was infectious diseases. Weather-related crises and drought, as well as terrorist and bioterrorist incidents were also addressed.
We also note that certain authors appear with regularity among the articles, either as authors or as supervisor on dissertations. In addition to Reynolds and Seeger, Lachlan, Liu, Quinn, T. Sellnow, Spence, and Veil were each author on at least five articles. Several of these individuals were involved in initial conceptualization, proposition development, and testing of the model.

**TABLE 2  Key Characteristics of Identified Documents**

<table>
<thead>
<tr>
<th>Discipline of First Author</th>
<th>Social Sciences: 28</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business/Management: 15</td>
<td>Engineering/Computer Science: 6</td>
</tr>
<tr>
<td>Medical/Nursing/Sciences: 34</td>
<td>Other (e.g., Education, Hospitality): 17</td>
</tr>
<tr>
<td>Communication: 141</td>
<td>Law/Politics/Politics: 10</td>
</tr>
<tr>
<td>Health/Health Education/Public Health: 127</td>
<td>Unable to determine: 6</td>
</tr>
<tr>
<td>Emergency Management/Safety/Security: 16</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Location of First Author’s Institution</th>
<th>Middle East: 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa: 1</td>
<td>North America: 236</td>
</tr>
<tr>
<td>Asia: 20</td>
<td>Pacific: 5</td>
</tr>
<tr>
<td>Europe: 118</td>
<td>Unable to determine: 2</td>
</tr>
<tr>
<td>Latin America/Caribbean: 8</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Region of Crisis/Disaster</th>
<th>Middle East: 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa: 2</td>
<td>North America: 202</td>
</tr>
<tr>
<td>Asia: 25</td>
<td>Pacific: 5</td>
</tr>
<tr>
<td>Europe: 81</td>
<td>Generic/Multiple: 68</td>
</tr>
<tr>
<td>Latin America/Caribbean: 12</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of Crisis/Disaster</th>
<th>Terrorism: 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bioterrorism: 11</td>
<td>Weather (e.g., hurricane, tornado, typhoon): 13</td>
</tr>
<tr>
<td>Drought: 13</td>
<td>Wildfires: 4</td>
</tr>
<tr>
<td>Earthquake: 7</td>
<td>General: 167</td>
</tr>
<tr>
<td>Flood: 6</td>
<td>Other (e.g., food, volcano, water): 12</td>
</tr>
<tr>
<td>Infectious diseases: 127</td>
<td>Uncertain: 10</td>
</tr>
<tr>
<td>Nuclear: 5</td>
<td></td>
</tr>
<tr>
<td>Radiological or chemical incident: 13</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of Article</th>
<th>Case study: 60</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research Report: 172</td>
<td>Other (e.g., presentations and proceedings): 12</td>
</tr>
<tr>
<td>Essay: 156</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Role of CERC in Article</th>
<th>Minor: 101</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimal: 299</td>
<td>Major: 101</td>
</tr>
</tbody>
</table>
Phase 2: Characteristics of Research in Which CERC Played a Central Role

RQ1 asked what type of research has been conducted on CERC. Among the 400 articles selected for inclusion, 19 satisfied criteria for further analysis in phase 2: (1) being research reports, and (2) assigning a central role to CERC. Characteristics of these articles are presented in Table 3. Among these studies, the most frequently used research methods were qualitative interviews with stakeholders (seven instances; one of these also used focus group discussions) and content analysis (seven instances). Typically, content analytic studies compared aspects of news coverage and social media releases about a specific crisis to CERC message construction guidelines for each crisis phase. Four studies employed experimental designs. One use of survey and one simulation were identified. As with the larger pool of articles identified in phase 1, the vast majority of the studies that investigated CERC in depth were undertaken in North America and Europe. Approximately one-fourth of the studies were funded, with funds supplied by a range of governmental agencies and institutions in the United States and Europe. Four of the studies were theses or dissertations.

RQ2 asked to what extent systematic research programs were associated with CERC. No researcher appeared as author or thesis/dissertation supervisor on more than one of the 19 articles in which CERC was a major focus, indicating it was not the subject of any systematic research program.

RQ3 asked to what extent propositions of the model had been tested. Only one of the 19 studies explicitly tested the CERC propositions identified by Veil and colleagues (2008): Aerts (2013). The Aerts study is a master’s thesis completed at the University of Twente. The research was a 2×2 between-subjects experiment which manipulated stage of crisis and efficacy beliefs in risk messaging on perceived threat, efficacy, information seeking, and self-protective behavior in a sample of the general Dutch population. In line with CERC predictions, both perceived efficacy as well as perceived threat were associated both with information seeking and protective behavior. Other experimental studies presented CERC as a broad foundational framework, but investigated
### TABLE 3  Characteristics of Research Reports That Either Applied or Tested CERC

<table>
<thead>
<tr>
<th>Study Reference</th>
<th>Type of Research</th>
<th>Sample Description (Nation)</th>
<th>Theory Tested</th>
<th>Funding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerts (2013)</td>
<td>Experiment</td>
<td>N = 224 Convenience sample of general Dutch population</td>
<td>Veil et al. (2008) Propositions 3, 4, 5</td>
<td>N/A</td>
</tr>
<tr>
<td>Ballard-Reisch et al. (2008)</td>
<td>Key informant interviews</td>
<td>N = 195 focus group participants (emergency responders, public officials, tribal health representatives, risk managers, members of public; N = 23 key informant interviews; N = 260 public school teachers and administrators</td>
<td>Reynolds &amp; Seeger (2005)</td>
<td>N/A</td>
</tr>
<tr>
<td>Cicognani &amp; Zani (2015)</td>
<td>Interviews</td>
<td>N = 30 experts, policy-makers, journalists, members of association of soldiers, families of victims (Italy)</td>
<td>None</td>
<td>Italian Ministry of Health, CDC grant</td>
</tr>
<tr>
<td>Early (2012)</td>
<td>Experiment</td>
<td>80 subscribers of a distribution list who signed up to take CERC training (United States)</td>
<td>None</td>
<td>N/A</td>
</tr>
<tr>
<td>Edworthy et al. (2015)</td>
<td>Experiment</td>
<td>Study 1: 50 university students Study 2: 173 university students (United Kingdom)</td>
<td>None</td>
<td>UK Home Office</td>
</tr>
<tr>
<td>Elway et al. (2014)</td>
<td>In-depth interviews</td>
<td>N = 97 stakeholders, 28 leaders, and four congressional staff members interviewed by phone, also 38 VA employees, 27 patients and family members interviewed on-site (United States)</td>
<td>None</td>
<td>VA Health Services Research and Development Service</td>
</tr>
<tr>
<td>Study</td>
<td>Method</td>
<td>Participants</td>
<td>Data Source</td>
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<tr>
<td>Freimuth et al. (2008)</td>
<td>Simulation</td>
<td>17 local health district risk communicators in Georgia (United States)</td>
<td>None</td>
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<tr>
<td>Herović (2016)</td>
<td>In-depth interviews</td>
<td>21 earthquake scientists (United States)</td>
<td>None</td>
<td></td>
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<tr>
<td>Herzberger (2014)</td>
<td>Experiment</td>
<td>100 students in various communication courses (United States)</td>
<td>None</td>
<td></td>
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<tr>
<td>Kieh et al. (2017)</td>
<td>Content analysis</td>
<td>133 magazine, newspaper, and blog posts; 40 academic review articles (various nations)</td>
<td>None</td>
<td></td>
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<tr>
<td>Maguire et al. (2016)</td>
<td>Content analysis</td>
<td>148 media reports of lapses in infection control practices in the Department of Veterans Affairs occurring between 2009 and 2012 (United States)</td>
<td>None</td>
<td></td>
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<tr>
<td>Nour et al. (2017)</td>
<td>Content analysis</td>
<td>134 stories published in major newspaper in Qatar during MERS-CoV outbreak; government documents (Qatar)</td>
<td>None</td>
<td></td>
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<tr>
<td>Palttala et al. (2012)</td>
<td>Survey</td>
<td>40 experts in governmental organizations (including rescue authorities) and NGOs (Finland)</td>
<td>None</td>
<td></td>
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<tr>
<td>Study</td>
<td>Methodology</td>
<td>Sample Description</td>
<td>None</td>
<td>N/A</td>
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<tr>
<td>Panagiotopoulos et al. (2016)</td>
<td>Content analysis</td>
<td>10,020 Twitter messages posted by official accounts of UK local government authorities in the context of two major emergencies (United Kingdom)</td>
<td>None</td>
<td>N/A</td>
</tr>
<tr>
<td>Rice &amp; Spence (2016)</td>
<td>Content analysis</td>
<td>400 tweets and respective websites of public safety organizations (United States)</td>
<td>None</td>
<td>N/A</td>
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<tr>
<td>Rickard et al. (2013)</td>
<td>In-depth interviews</td>
<td>27 health officials and journalists who were involved with a pneumonic plague death (United States)</td>
<td>None</td>
<td>N/A</td>
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<tr>
<td>Rissannen (2016)</td>
<td>In-depth interviews</td>
<td>Nine communication professionals from three medium-sized Finnish cities and three different NGOs (Finland)</td>
<td>None</td>
<td>N/A</td>
</tr>
<tr>
<td>Thomas et al. (2016)</td>
<td>In-depth interviews and content analysis</td>
<td>631 news stories; 11 stakeholder interviews (United States)</td>
<td>None</td>
<td>N/A</td>
</tr>
<tr>
<td>Vos &amp; Buckner (2016)</td>
<td>Content analysis</td>
<td>25,598 tweets about the H7N9 virus (United States)</td>
<td>N/A</td>
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</table>

Among the other 16 research reports in which CERC played a major role, a large portion used CERC principles as presented in the CERC Manual to evaluate adequacy of news coverage, tweets, and other public health responses during a specific crisis (Kieh et al., 2017; Maguire et al., 2016; Nour et al., 2017; Ophir, 2018; Panagiotopoulos et al., 2016; Thomas et al., 2016). For example, Maguire and colleagues developed a coding scheme based on the CERC Manual and evaluated the extent to which certain components of effective communication were more present than others in Department of Veterans Affairs infection control lapse incidents between 2009 and 2012. Freimuth et al. (2008) designed a 4-hour simulation based on CERC principles in which 17 local health district risk communicators in Georgia were assessed with respect to their adherence to risk communication guidelines under time pressure. Qualitative studies largely addressed the same topics. Cicognani & Zani (2015) and Elway et al. (2014) investigated communication through phases of a crisis via retrospective interviews of crisis communication or emergency response personnel. Herović (2016) and Rissanens (2016) conducted individual in-depth interviews about characteristics of effective communication within the pre-crisis phase.

**Discussion**

CERC was first formulated nearly 20 years ago and published for academic audiences 15 years ago. It has, to all appearances, been highly useful as a tool for practitioners (US Department of Health and Human Services [HHS] and CDC, 2018). Indeed, the model has largely served the purpose for which it was originally created. Until now, however, it has not been clear whether CERC has also served to generate research that goes beyond existing best practices
to add knowledge, predictive and testable in nature, about crisis communication in public health emergencies. Findings of this systematic review indicate that although a robust body of research has cited and applied the CERC model in case studies, few projects have empirically tested CERC.

This state of affairs is consistent with the general situation in disaster preparedness literature. Scholars have repeatedly concluded that evaluation efforts are usually not scientifically rigorous (Jose & Dufrene, 2014; Miller et al., 2017; Nour et al., 2017; Williams et al., 2008). Methods used for evaluation have been found to be heterogeneous and often not well-described (Beerens & Tehler, 2016), few standardized assessment tools exist (Gallardo et al., 2015), and control groups are rarely used (Williams et al., 2008). Like CERC, research on crisis communication training more broadly has been found to focus overwhelmingly on crises in Western nations (Miller et al., 2017). Many of these limitations stem from the fact that disaster communication research is often applied in nature and seeks to retrospectively understand how and why communication strategies employed during the crisis were or were not successful.

Nevertheless, an opportunity exists to further refine CERC in a way that advances scholarly work in the area and increases the utility of the model for practical application. A systematic review cannot definitively determine why something has not been empirically tested. However, the fact that a large proportion of the investigations of CERC consist of content analyses of news coverage through stages of crises (Kieh et al., 2017; Maguire et al., 2016; Nour et al., 2017; Ophir, 2018; Panagiotopoulos et al., 2016; Thomas et al., 2016) suggests that researchers have found the stage elements of the model more useful in highly applied settings as a standard for retrospective critique than as a predictive tool about the outcomes of that messaging. Furthermore, all of these studies assessed news coverage over the life of a crisis by comparing them to CERC as presented in CDC publications like the CERC Manual (U.S. Department of Health and Human Services [HHS] and CDC, 2018), rather than measuring against Veil et al.’s (2008) formal propositions.
Only one experimental study we located attempted to compare communication within different stages of a crisis: Aerts (2013). The same study was the only one to test any of Veil et al.’s (2008) propositions. Other experimental studies investigating CERC have focused on relationships between characteristics of crisis communication and outcomes in members of the public (Edworthy et al., 2015; Herzberger, 2014). In that sense, they are consonant with the emphasis of the six principles in the CERC Manual (U.S. Department of Health and Human Services [HHS] and CDC, 2018).

Based on this analysis, we conclude that although CERC is theoretically grounded, its contribution could be extended if it were presented in a different form. To reach this potential, the model should be formatted so as to include testable statements predicting relationships between characteristics of communication (timeliness, accuracy, source credibility, empathy, action-orientation, and respect) and audience outcomes (e.g., uncertainty reduction, self-efficacy) identified in the CERC Manual. These statements need to be parsimonious, but collectively provide a coherent structure by which knowledge can be organized (Berger & Chaffee, 1988).

Figure 2 presents a straightforward graphic depiction of the relationships described in CERC that can be used to generate a range

![Figure 2: Graphic Representation of CERC Principles]
of testable hypotheses (U.S. Department of Health and Human Services [HHS] and CDC, 2018). All six message characteristics (timeliness, accuracy, credibility, empathy, action-orientation, and respect) are positively associated with self-efficacy and knowledge, and negatively associated with uncertainty and emotional turmoil. In turn, self-efficacy and knowledge are positively associated, and uncertainty and emotional turmoil negatively associated, with the ultimate goal of risk protective behavior among audience members. Two-way communication with stakeholders functions as an antecedent variable, enabling health communicators to shape essential characteristics of messages more effectively. Predictive statements can be derived by tracing the causal paths of the model, thus providing a coherent structure for organizing resultant knowledge. Predictions can be tested within the parameters of any crisis stage and readily lend themselves to experimental research. By clearly articulating such predictive statements, applications of the CERC model can move beyond case studies to include simulations and experiments that align message testing with the various stages of the model. The resulting research would address the need for rigorous message testing in disaster preparedness described above (Jose & Dufrene, 2014; Miller et al., 2017; Nour et al., 2017; Williams et al., 2008).

**Limitations and Conclusion**

Though guided by rigorous systematic review protocols, this work was limited in several ways. First and most importantly, literature may have been missed in our searches. Though one of the authors is a librarian with extensive experience in systematic reviews, some work may have been overlooked. In particular, the bulk of the literature examined was also in English and although several non-English language databases were searched there may be relevant scholarly work in other languages we did not uncover. Additionally, coding protocols relied on expert coding and resolution of inconsistencies through discussion which precluded traditional measures of inter-coder reliability.

In conclusion, with thousands of references uncovered and likely thousands more unpublished applications of the work in the field, the current study clearly demonstrated CERC is widely
applied across risk and crisis contexts. However, rigorous theory-guided empirical investigations of CERC are largely absent. We have provided a broad overview of existing scholarship and a proposed framework with clear direction for further CERC development and contributions. CERC has demonstrated robust scope and explanatory power, and with increased focus on ensuring testable formal development building on knowledge gained from this systematic review, it is likely CERC can additionally generate theory testing and new knowledge of crisis and risk communication.

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References from Studies Applying or Testing CERC


**References**


The Conceptualization of Risk Tolerance and Scale Development for Measuring Publics’ Tolerance of Individual Health Risks

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ABSTRACT

Risk tolerance, identified by scholars over two decades ago as an essential concept in risk communication, has remained understudied without clear conceptual and operational definitions. As the first study developing a multiple-item scale for measuring at-risk publics’ tolerance of different risk types, this study refines the conceptualization of risk tolerance and advances its operationalization in the setting of individual health risks. Qualitative research (in-depth interviews: n = 28; focus group: n = 30) and two survey datasets (sample 1: n = 500; sample 2: n = 500) were employed for scale development and testing. Results identify that two types of individual health risk tolerance exhibited by at-risk publics: (1) Compulsive tendency toward risk taking (CTRT), as evidenced in their unwillingness to refrain from risky behaviors even if they know the negative consequences and (2) inertial resistance to risk prevention (IRRP), as indicated by their indifference toward or intentionally ignoring health messages advocating for behavioral changes. The two-factor 13-item scale’s reliability, factorial structure, and validity are further assessed. This risk tolerance scale provides a valid and reliable psychometric tool for risk communication scholars and practitioners to measure publics’ tolerance of different individual health risks in order to design effective messages to overcome it as a barrier.

KEYWORDS: risk, risk communication, risk tolerance, health risk, measurement, scale development

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To strategize and execute more effective risk messages and emergency responses that motivate at-risk publics to take protective action is a critical task of risk communication scholars and practitioners (e.g., Heath et al., 1998; Heath & Palenchar, 2000; Heath, Lee, & Ni, 2009; Heath et al., 2019). When publics perceive a health risk from external threats, they perceive uncertainty, fear, and anxiety not only for the symptoms (and negative effects they are experiencing) but also for the causal factors that brought those symptoms (Aakko, 2004). Uncertainty has been defined as an individual’s probabilistic belief (Dowling, 1986; Peter & Tarpey, 1975), the adverse consequences of which was defined as the amount at stake in buying goals (Cox & Rich, 1964) and the importance of loss (Taylor, 1974). Thus, to reduce felt uncertainty among at-risk publics and better fulfill health organizations’ mission via purposeful use of risk communication as an integral part of strategic communication (Hallahan et al., 2007), risk communication practitioners need to be equipped with evidence-based knowledge of individual psychological barriers that prevent publics from taking preventative or protective actions.

Among psychological barriers limiting risk communication effectiveness, **risk tolerance** is a critical yet understudied one in the field of risk communication, thus a focal construct of this study. Risk tolerance first appeared in the literature of strategic communication over two decades ago (e.g., Heath et al., 1995; Nathan et al., 1992), positing that publics have different risk tolerance levels depending on the risk characteristics and individual differences. Thus far, however, we have only limited knowledge, with little empirical evidence, regarding risk tolerance and its effects in risk communication and management, as well as a lack of a systematically developed and tested measurement tool that directly captures risk tolerance itself as manifested in different risk situations (e.g., preventable individual health risks). To directly respond to these conceptual and measurement gaps associated with at-risk publics’ risk tolerance and its impact on risk communication outcomes, this study focuses on explicating the concept of risk tolerance itself, in the context of individual health risk communication.

To do so, this study first reviews key concepts in risk communication and provides a refined conceptualization of risk tolerance,
based on current literature in which similar concepts were used in understanding publics’ risk perception and responses. Then, a scale for measuring individuals’ risk tolerance is developed and tested using two survey datasets based on U.S. adult samples. With the established validity and reliability, this new risk tolerance scale has the potential to advance risk communication theory and provides an improved measurement tool for scholars and practitioners to gauge risk tolerance as a psychological barrier to behavioral change in order to overcome it via more effective risk communication efforts.

**Literature Review**

**Risk and Risk Perception**

Risk, mostly from a health communication perspective, is generally described as the threat potential for injury, disease, and even death under certain circumstances (e.g., Chen, 2018; Gaube et al., 2019; Hunter & Fewtrell, 2001). Risk is defined as societal common belief of the perception of the possibility of a negative event (S. Venette, 2008; S. J. Venette, 2003). One of the ways to understand how a potential for a specific event is perceived as a risk is dependent on the convergence between control and dread (Slovic, 1987). For instance, when people perceive a certain risk as “voluntary,” they also tend to judge that risk as “controllable.” On the other hand, when a risk is perceived as “dread” risk, there is a lack of controllability and unfair distribution of risks and benefits (Slovic, 1987). Nuclear weapons and nuclear power were referred as examples of high dread risk (Slovic, 1987). Through communicating risk, publics could estimate their own level of control and dread, the decision of which can affect how much they willingly tolerate that risk. Risk communication, centering on the dissemination of risk information to at-risk populations, takes place in a variety of situations, from product harms to national crises such as Three Mile Island (V. T. Covello et al., 1988). When a risk is communicated by governmental officials, expert and/or laypeople (V. T. Covello et al., 1988), individuals who receive such risk information start their own process of perceiving the risk itself.
At-risk publics, a concept used by scholars in health risk communication and disaster communication (e.g., Bean et al., 2015; Liu et al., 2017), refers to any individual or groups of individuals who are exposed to or potentially facing a preventable risk that is directly threatening their own health, safety, and/or well-being; if they choose to tolerate the risk (by not taking preventive actions), they are likely to face the negative consequences of the risk in the future. For example, in the context of getting human papillomavirus (HPV) as a preventable health risk, at-risk publics can include all sexually-active young adults who have not received an HPV vaccine; if they choose to tolerate this risk (i.e., postpone receiving the HPV vaccine as a preventative measure), they could potentially get HPV infection and face unhealthy consequences as a result.

Perceived risk, from the perspective of at-risk publics, has been conceptualized into two dimensions: uncertainty and adverse consequences (e.g., Bauer, 1960; Chen, 2018; Dowling, 1986). Individuals’ process of perceiving a risk is multidimensional, influenced by different factors including trust, voluntariness, controllability, familiarity, benefits, catastrophic potential, and uncertainty in relation to a given risk (Covello, 2008; Gaube et al., 2019; Paek & Hove, 2017). This also can be explained by “control” and “dread” people perceive from each specific risk (Slovic, 1987). How much control and dread people have toward a risk can influence how they perceive that risk. Furthermore, individuals tend to experience different levels of fear, worry, anxiety, or anger, depending on how they perceive and judge these factors (Covello, 2008). A prior study found that there is a greater level of media coverage for “dread” risk compared to “controllable” risk (Slovic, 1987). Thus, at-risk publics could depend more on their media consumption to decide their coping strategies for a “dread” risk compared to a “controllable” risk. As individuals perceive and feel these influencing factors differently, they tend to perceive the risk itself differently and thereafter enact different risk responses (Covello, 2008), which sheds light on: (1) why some risks end up inducing more extreme responses than others and (2) why some risks are more tolerated than others.

In the context of medical hazards, Slovic and his colleagues (1989) suggested risk (e.g., seriousness of harm) and warning (e.g.,
newness) as two factors of risk perception. This is also applicable in understanding individuals’ tolerance or avoidance of nuclear power plants and nuclear waste repository (Groothuis & Miller, 1994; Slovic, 1992). For instance, publics perceived a nuclear waste repository more negatively compared to a nuclear power plant (Slovic, 1992). Slovic (1992) also suggested locating a risk in the perspective of interrelationship of “Unknown Risk” and “Dread Risk” (p. 123). As an example, the public perceived nuclear weapon fallout as both a high “Unknown Risk” and a high “Dread Risk” (Slovic, 1992).

Furthermore, individuals tend to judge relatively unknown risks as more uncertain compared to those that are well-known (Covello, 2008). Rooted in the expectancy model, individuals are likely to have higher motivation to change their behavior when they believe (with perceived high probabilities) that their effort put in behavioral change can bring positive outcomes (Fishbein & Ajzen, 1975). Therefore, to be more effective in motivating at-risk publics for behavioral change, risk communication practitioners need to gauge, with enhanced accuracy, the level of probabilities at-risk publics believe in terms of the positive outcome should they decide to take risk-prevention measures.

**Earlier Definitions of Risk Tolerance**

Over two decades ago, Nathan and colleagues (1992) posited that individuals have different risk tolerance level depending on the risk characteristics and individual differences. According to Heath and his colleagues (1995), whether an individual is to tolerate a risk or not is determined by whether one perceives benefits over risks in a given situation. The limited empirical evidence as associated to risk tolerance in strategic communication suggests: (1) lower level of risk tolerance seems to be correlated with higher perceived risk (Heath et al., 1995; Nathan et al., 1992) and (2) individuals with low risk tolerance are likely to perceive the source of risk as more harmful than those who tolerate risk more. However, what is risk tolerance itself, or in other words, what indicates the level or degree of an individual's risk tolerance, remains unknown. Recently, Slovic (2016) called for more studies on at-risk publics’ “tolerance of risk” (p. 25), which might hold the key to a fuller
understanding of the mechanisms beneath the observed differences in risk perception and responses as well as to filling in the knowledge gap regarding uncertainty (Liu et al., 2016) in the larger domain of strategic communication research and practice.

There are several challenges that need to be addressed as scholars delve into improving the conceptual and operational definitions of risk tolerance. First, the multidimensional nature and relational aspects of risk tolerance need to be emphasized in the theorizing process, as advocated in the earlier work of Baird and his colleagues (e.g., Baird, 1986; Baird et al., 1987). Regarding the relationship between risk voluntariness and risk tolerance, for instance, Baird (1986) found that, compared to an involuntary risk, individuals perceived a voluntary risk as more tolerable. Also reported by Baird (1986) was that risk tolerance was correlated to a variety of attitudinal and demographic variables (e.g., perceived benefit, immunity to the risk, costs in risk control, number of years individuals lived in the community). Second, the distinction between the concept of risk tolerance itself and the determinants that lead or correlate to varied risk tolerance level needs to be clearly made. For example, in studying risk tolerance in the context of regarding air pollution as an environmental health risk, Baird (1986) did not directly measure risk tolerance itself but postulated other determinants instead that correlated with risk tolerance (e.g., risk voluntariness or perceived benefit and harm). Therefore, a clear definition of risk tolerance itself (not its determinants) and its direct measure (capturing how risk tolerance manifests itself in different observable ways) are essential to further theorizing risk tolerance.

In sum, these pioneering works on risk tolerance (including other relevant concepts and its determinants) and the earlier empirical evidence have shed light on the direction of further explicating risk tolerance in health risk context. First, risk tolerance is a multidimensional construct (Baird, 1986; Baird et al., 1987). Second, although a relational approach to the understanding of the formation of risk tolerance is relational (influenced by risk perception and factors contributing to different risk perceptions) (e.g., Covello, 2008), the examination of which factors influence one's decision to tolerate a risk (or not), based on benefit/risk
perception, is not a direct measure of risk tolerance itself. Previous approach to risk tolerance (i.e., focusing on identifying factors that lead to varied risk tolerance) does not provide explanation when individuals choose to tolerate a risk despite the fact that they are aware of the greater benefit of following risk-prevention recommendations. Furthermore, although the existing operationalization of risk tolerance helps measure the surroundings of risk tolerance, it provides no direct measure of the attributes of the construct itself (e.g., the degree or likelihood an individual is or is not willing to tolerate a specific risk). Additionally, individuals do not perceive risk and benefit symmetrically (Sjöberg & Drottz-Sjöberg, 2001). For instance, compared to those who perceived the benefits of having a nuclear waste repository, people who had the desire to avoid the risk itself exhibited much stronger motivation for taking actions accordingly (Groothuis & Miller, 1994).

Therefore, a refined conceptualization and an improved scale that specifically measures risk tolerance itself, rather than assuming the level of risk tolerance through perceived benefit and risk, is necessary. The following sections further delineate: (1) our proposed conceptualization of at-risk publics’ risk tolerance in the context of preventable health risks, and (2) a multiphase empirical study through which a multidimensional scale, directly measuring individuals’ risk tolerance, was developed and tested.

**Conceptualization of Risk Tolerance**

Risk communication contributes to the well-being of individuals and communities (Heath & Abel, 1996). To inform publics with accurate risk information and motivate them for protective action taking, health organizations and emergency response services need to understand how publics perceive risks differently and what communication barriers they need to overcome. As Haukenes (2004) pointed out, risk is difficult to explain and new approaches to risk communication are needed to identify new dimensions of risk perception and uncover hidden barriers that complicate the relationship between risk perception and health/safety-related behaviors (Rudisill, 2013). Risk tolerance is one of
the hidden barriers, the conceptualization and operationalization of which is yet to be fully examined.

Ever since the pioneering work on risk tolerance (Nathan et al., 1992; Heath et al., 1995), which primarily focused on environmental health risks, little theoretical or empirical advancement has been made regarding risk tolerance in the strategic communication discipline. To extend the existing risk tolerance research and extend its scope and application to different risk communication areas, we start the process of explicating risk tolerance with conceptualizing it in the context of risk communication, drawing evidence-based insights and inspirations from other social scientific disciplines.

**Risk Tolerance Emerged from a Multidisciplinary Tapestry**

The concept of “tolerance” is rooted in a rich multidisciplinary soil, nourished by studies in education, project management, financial planning, and economics. In the field of education, tolerance is defined as the opposite concept of discrimination, which let people act against ones that they dislike and disagree with (Vogt, 1997). On the contrary of discrimination, tolerance requires self-control and involves support for others’ rights even though the others are people whom they dislike or have a negative attitude toward (Vogt, 1997). Individuals’ tolerance level can be predicted by personality traits, religious guidance, and age, as well as influenced by education (Vogt, 1997). Tolerance is strongly associated with negative emotions, as a core of tolerance lies in overcoming disliking a particular subject (Vogt, 1997). Therefore, we expect that when at-risk publics tolerate a risk (e.g., individual health risk), they are likely to perceive the negative effects of those risks and may consequently experience certain negative discrete emotions.

In the field of project management, risk tolerance of a project (project risk tolerance) is considered as a changing variable throughout the life of a project, with a firm, a project manager, and/or stakeholders as decision makers for tolerating a project risk or not (Kwak & LaPlace, 2005). This definition emphasizes the dynamics of key players that jointly trigger risk tolerance, which suggests that, in the context of risk communication, organizations
and at-risk publics are likely to interact and co-shape the level of individuals’ risk tolerance.

Financial planning literature has defined risk tolerance as how much one is willing to engage in behaviors that can cause uncertain outcome with possible negative outcome (Irwin, 1993). In the literature of economics, risk acceptability, a concept similar to risk tolerance, is decided according to a simple cost-benefit analysis, which means that a risk is acceptable if the economic savings arisen out of action to reduce a risk outweigh the cost of such action (Hunter & Fewtrell, 2001). These benefit/risk decision-making approaches align with strategic communication scholars’ argument that publics perceive benefits over risks to decide whether to tolerate a risk or not (Heath et al., 1995). These findings also shed light to the expectation that at-risk publics are more likely to tolerate a risk when their perceived risk uncertainty is low.

Based on how the above multidisciplinary research has defined risk tolerance, we posit that, in the context of risk communication, risk tolerance is manifested as at-risk publics’ level of tolerance toward an emergent or existing issue containing risks if not responded to as instructed.

**Risk Tolerance as Unwillingness to Overcome a Preventable Risk**

To clearly define risk tolerance, it is necessary to first differentiate it from other similar yet distinct concepts (e.g., risk taking, acceptable risk, risk acceptance). Scholars have conceptualized publics’ predisposition for risk-taking tendency as an engagement in behaviors acknowledging the risk’s likelihood of a punishment or a reward loss (Ferguson et al., 1991). Laypeople’s tolerating attitudes were found to be influenced by qualitative factors including not only fatality information but also familiarity, voluntariness, controllability, fairness, acuteness, time and space, and individual mitigation (Covello, 1983; Fischhoff et al., 1978).

Risk communication scholars further studied how individuals might be “accepting” and/or “avoiding” a risk. On one hand, risk literature has explored the concept of acceptable risk at an individual level, which depends on the perceived level of voluntariness,
ability to escape with precautions, familiarity, natural causes, short-
term influence, and understanding of science (Bennett, 1999). Starr (1969) and Baird (1986) found that people tended to accept
risks more when they perceived benefits from activities involv-
ing risks for both technological and environmental health risks. Risk acceptability was further discussed independently regarding
each specific risk, depending on the cause of risk topic (natural or
man-made) (Fell, 1994). Risk acceptability, on the other hand, is
a concept developed at community/group level and described in a
disease burden approach, amounting to how much total burden of
disease (as a health risk) a certain community can take (Hunter &
Fewtrell, 2001).

These previous studies on risk taking, acceptable risk, and/
or risk acceptance, regardless of the unit of measurement, have
focused more on which characteristics in a risk motivate people to
accept the risk more. These concepts, however, do not necessarily
reflect the fact that, in many risk situations (e.g., individual health
risks), at-risk publics know about what the risk is and what the
alternatives are to overcome the risk (e.g., following recommended
risk-prevention actions) (Tchiehe & Gauthier, 2017). Additionally,
while accepting a risk means that after doing cost-benefit analy-
thesis the risk would be fully taken into the decision maker (Baird,
1986; Starr, 1969), tolerating a risk does not always mean that the
risk is fully taken by oneself. The latter pertains more to observed
behaviors of postponing following recommended risk-prevention
behaviors or deliberately ignoring such instructions, driven by
one’s unwillingness to overcome a preventable risk. Ignoring rec-
ommended behaviors can grow into habitual inertia, which can
motivate people to keep their old behavior (Covello & Sandman,
2001). At the individual level, this type of inertia in people can
explain how and why people are tolerating a risk, even though
they know what to do to prevent the risk from harming them-

selves. Inertia can also be found at the institutional level, result-
ing in resistance to policy change regarding public environmental
risk (Harries & Penning-Rowsell, 2011). Therefore, given the main
conceptual difference between the existing risk-taking and/or
risk-accepting concepts in previous literature and the risk toler-
ance concept this study posits, the current study focuses on risk
tolerance by exploring individuals' risk tolerance, or their unwillingness to overcome a preventable risk, as formed through different psychological processes such as inertia (e.g., habitually falling back to existing risky behaviors) or the opposite force (e.g., compulsively driven forward to resist behavioral changes), grounded in Covello and Sandman’s (2001) framework.

Another concept relevant to risk tolerance is risk bearing (Fama, 1980; Kasperson & Palmlund, 1989; Waymer & Heath, 2015), which is agency (e.g., organizations, companies, and entities) focused. The essence of risk bearing lies in that: (1) risk bearers have a role of their own in taking a risk of uncertainty (e.g., a nuclear plant as an organization chooses to bear a risk that could affect itself) and (2) if things go wrong, risk bearers accept the losses of their own. As Coombs and colleagues (2019) pointed out, one of the purposes of risk communication is to achieve more effective communication between different risk bearers suffering from risk outcomes and/or risk generators (e.g., organizations whose business unavoidably generate risks, and publics who can be affected by risk consequences). For instance, at the organizational level, a company may need to choose whether to bear certain risk of losses if the risk would happen or to avoid the risk in advance by taking risk-prevention action (e.g., investing in prevention through insurance). Therefore, it is important for a risk-generating risk bearer (e.g., chemical companies) to plan and implement strategic risk communication mindfully so as to optimize the risk tolerance among other groups of risk bearers that are under the threat of potential risk outcomes (e.g., people who are living near the chemical plants) (Heath & O’Hair, 2009).

More recently, according to Brady (2012), most social science risk perception research has focused on either “what characteristics of a risk increase or decrease its perceived risk by members of the public” or “what are the characteristics of individuals perceiving a risk that lead some people to perceive risks differently from others” (p. 548). Risk acceptability literature, for example, tends to focus more on the uncertain nature or characteristics of a risk itself (Kentel & Aral, 2007). More research is needed to examine what psychological processes and individual characteristics contribute to differed perception of and response to the same risk. As
Eastin et al. (2015) advocated, risk communication scholars need to examine different decision-making stages among at-risk individuals, including those who have decided to act and those who have decided not to act.

Therefore, by shifting the focus from the characteristics of a risk itself to the characteristics of individuals who tolerate the same risk differently (Brady, 2012; Eastin et al., 2015), the concept of risk tolerance helps gauge how at-risk publics cope with a risk as evidenced in how much tolerance of a risk they are willing to take by not overcoming a preventable risk. Furthermore, this study focuses on refining the conceptual and operational definitions of risk tolerance in the context of individual health risks, which echoes the urgent need of more effective public health communication about preventable health risks. According to the U.S. Department of Health and Human Services (U.S. HHS), preventable health risks are risks that can be prevented (e.g., one course of the birth defects, as a health risk, can be contributed by alcohol use during pregnancy, which is preventable by avoiding using alcohol) (U.S. HHS, 2000). Under this overarching umbrella, the conceptualization and scale development of risk tolerance in current study can be applied to any preventable health risk settings, in which at-risk publics are: (1) are aware of how to reduce a preventable risk and (2) have access to risk-prevention instructions, but (3) intentionally neglect following recommended behavior to avoid, reduce, or adverse the risk itself.

As Bennett (1999) argued, whether a risk is acceptable or not depends on how much voluntariness there is for the risk and if an individual has the ability to escape from such risk with precautions. In a similar vein, yet focusing on the uniqueness of what risk tolerance intends to capture as an individual psychological barrier for changing risky behavior, we define risk tolerance as at-risk publics’ degree of unwillingness to overcome a preventable risk that threatens their own health, safety, and/or well-being. Grounded in Covello and Sandman’s (2001) framework, it is manifested in their individual behaviors of: (1) habitually falling back to existing risky behaviors sustaining risky behaviors (e.g., displayed indifference toward or intentionally ignoring health messages advocating for behavioral changes) or (2) compulsively driven forward to resist
behavioral changes (i.e., exhibited unwillingness to refrain from risky behaviors even if they know the negative consequences). We further posit that individuals’ decisions on whether to tolerate a preventable risk (or not) can determine whether (and if so, to what degree) certain risky behavior change is either enabled or inhibited at individual level.

**Gauging Risk Tolerance in Individual Health Risk Communication**

When and why people seek information regarding potential negative consequences of an action in the context of environmental, health, and natural disasters are among the most important research questions for risk communication scholars (Griffin et al., 1999; Kahlor, 2010). Brady (2012) posited two types of risk with different perceived level of control: (1) individual health risks over which individuals have perceived control and (2) disasters over which individuals have little or no perceived control. Publics’ risk perception about specific risk topics also vary according to personal and societal factors (Krewski et al., 2012).

In addition, according to the probability and impact matrix by the Office of Government Commerce (OGC), project risk tolerance is the highest when there is high probability of inherence risk and low resulting impact, while project risk tolerance is the lowest when the resulting impact is higher with the medium level of probability (OGC, 2001). Similar to how Bennett’s (1999) study on public health risks, risks assessed from project management were tolerated more when it was more inherent. Therefore, it posits the possibility that individuals might tolerate different risks with varied degrees, depending on whether the risks are more inherent (e.g., individual health risks) and level of risk controllability as perceived by individuals. Therefore, due to the change of tolerance level depending on other risk factors, such as inherence and controllability, the measurement for risk tolerance can reflect this state-based aspect of risk tolerance. To extend the application of risk tolerance to public health crisis management, for example, during the pre-crisis stage (Reynolds & Seeger, 2005) or before any prominent crisis happens in a community, if health
communication practitioners need to gauge the existing level of health risk tolerance among members of the at-risk community, risk tolerance level, about a specific risk topic or issue, can be used as a trait-based measure.

Taking these scholarly concerns into consideration, in this study, we focus our first attempt to advance risk tolerance measurement on the front of individual health risks, more inherent risks (Bennett, 1999) over which individuals have perceived control (Brady, 2012). By so doing, we aim to: (1) have a focal risk context for scale development and (2) provide context-specific recommendations for health communication practitioners to design more effective health risk messages that help reduce uncertainty (Reynolds & Seeger, 2005). Additionally, public health information officers can use the risk tolerance scale to gauge their at-risk publics’ risk tolerance level regarding specific health issues and then utilize such knowledge to tailor health information design and dissemination, especially via the use of local health agenda and resources (Avery, 2019). The scale will equip practitioners with a valid and reliable measurement tool to identify and then overcome hidden barriers (e.g., risk tolerance) in order to motivate at-risk publics’ behavioral change toward improved life.

Methods and Risk Tolerance Scale Development

Initial Items: Generation and Procedures

To generate initial items that ensure the content validity of the risk tolerance scale in the context of individual health risks, we conducted a qualitative study to explore how individuals describe their own experience of tolerating a health risk that threatens their own health and well-being. A total of 28 in-depth interviews with non-student adults in the U.S. and a focus group of 30 college students enrolled at a large Southeastern university in the U.S. were conducted, aiming at capturing the actual descriptors of how people tolerate health risks (i.e., unwillingness to modify their risky behavior, even when they are aware of the benefits of overcoming preventable risks by following recommended actions). The same set of open-ended questions were asked in both the focus group and in-depth interviews to explore:
1. how participants tolerated preventable risks (as defined by the researchers) according to their own direct experiences;
2. any emotions they felt during their risk-tolerating processes;
3. their experiences of ignoring any health messages regarding recommended behavior;
4. what triggered them not to follow the recommended behavior; and
5. what could help reduce their risk tolerance.

The example questions from these in-depth interviews and focus groups include: “Have you ignored any health messages regarding the recommended healthy behavior? If so, please describe your experience” and “Have you intentionally tolerated any type of health risks or technological risks? Is there any type of risks that you wanted to tolerate more? If so, please share any example” and so forth.

The transcripts from both focus group discussion and interview were then analyzed, following the qualitative data analysis guidelines recommended by Lindlof and Taylor (2017). The qualitative data were initially reduced during qualitative coding by removing irrelevant information. Data were then reorganized and merged into common themes. The last stage (conclusion drawing and verification) involved identifying and interpreting categories and patterns. As the key step for ensuring content validity of a new scale, we extracted any relevant (or likely-to-be relevant) indicators and statements, rendered in participants’ own wording and based on their vivid descriptions. Throughout the process, as many-as-possible items likely displaying or exhibiting individuals’ risk tolerance, capturing different aspects of risk tolerance as a construct, were identified and organized in the form of individual statements, ready to be incorporated into a survey instrument. As a result, a total of 53 items were generated as the initial pool of risk tolerance items, in the form of 53 statements (i.e., 53 different indicators manifesting how an individual health risk is being tolerated) to be further assessed for further consideration in the risk tolerance scale (see Appendix A).
Next, two online survey data sets were collected using Qualtrics survey panels among U.S. adults (Sample 1: \( n = 500 \); Sample 2: \( n = 500 \)) from February to May in 2019. At the beginning of the survey questionnaire, the definition of “risk” in the general context of individual health risk was provided. Participants were then instructed to think of a health risk that fits into all three criteria: (1) “You are aware of and concerned about it personally”; (2) “You know that there are ways to overcome the danger of this health risk by modifying your behavior (e.g., stop doing certain things or taking actions recommended by your doctor)”; (3) “Nevertheless, you choose to tolerate this health risk by ignoring or refusing to follow recommended behaviors.” After reading this instruction, participants were asked to respond to each of the 53 survey items, each representing one of the 53 risk tolerance items generated in the prior qualitative phase. Participants’ assessments of their agreement with each item, regarding their own tolerating of the specific health risk they individually focused in mind, were measured using a 7-point Likert-type scale ranging from 1 (strongly disagree) to 7 (strongly agree). Aiming to develop a scale assessing individuals’ tolerance of risks across different risk types and contexts, the above approach (i.e., instructing individual participants to choose and focus on one specific risk they each have been tolerating, instead of providing a specific risk context for them) was chosen, adopting a similar approach taken by Cornia et al. (2016) in capturing differences in disaster management from different cultural contexts.

**Item Reduction and Reliability Testing**

Survey Sample 1 (\( n = 500 \)) was used for item reduction and exploratory factor analysis (EFA). We first checked to see if there was any item (1) with low correlation with other items and/or (2) without normal distribution (e.g., highly skewed distribution) (Clark & Watson, 1995). No item was sorted out through this process. As a result, all 53 items remained for the next step of item reduction.

**Item reduction.** For the next step, principal component analysis (PCA) with Promax rotation was chosen due to its advantage of being fast and good at presenting in a conceptually simple way
(Abdi & Williams, 2010; Hendrickson & White, 1964). This initial step in data analysis (using all 53 items) returned six components with initial eigenvalues greater than 1 (explaining 65.96% of the variance). To test the appropriateness of factor analysis, the Kaiser-Meyer-Olkin (KMO) test of sampling adequacy and the Bartlett test of sphericity were used (Kaiser & Rice, 1974). Our data indicated the KMO level of .97 and the significance of the Bartlett test (.00).

During this process, we first checked whether there was any item with factor loadings less than .40 (Tabachnick et al., 2007). None of the items was in the above criterion, which led to dropping zero items from this step. Then a total of 16 items with communality value less than .50 were identified and eliminated (Meyers et al., 2013). Last, we checked whether any of the remaining items cross-loaded in more than one component with factor loadings more than .50 (Richman, 1988; Tabachnick et al., 2007), which led to the elimination of another 24 items. As a result, a total of 13 items remained in the risk tolerance inventory after the above item reduction series.

**Exploratory factor analysis.** Taking into consideration that the possible factors of risk tolerance themselves may be correlated (Comrey, 1988) as posited earlier in our conceptualization, a Principal Axis Factoring with Promax Rotation (used when correlation between factors are expected theoretically) was performed next on the remaining 13 risk tolerance items. As a result, two factors and 13 items were rendered as the recommended structure and items for measuring risk tolerance. The two-factor solution corresponded well with the conceptualization of risk tolerance as manifested in individuals’ behaviors of (1) *habitually falling back* to existing risky behaviors sustaining risky behaviors (e.g., displayed indifference toward or intentionally ignoring health messages advocating for behavioral changes) or (2) *compulsively driven forward* to resist behavioral changes (i.e., exhibited unwillingness to refrain from risky behaviors even if they know the negative consequences. Factor loadings from this final step of EFA for the 13 items are presented in Table 1.
## TABLE 1  Structural Analysis of Risk Tolerance Inventory Items

<table>
<thead>
<tr>
<th>Items</th>
<th>EFA Factor Loadings</th>
<th>CFA Factor Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Factor 1:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Compulsive Tendency toward Risk Taking (CTRT)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I did it anyways, even though I knew it was an unhealthy choice</td>
<td>0.77</td>
<td>0.70</td>
</tr>
<tr>
<td>I know that what I chose is not a smart decision, and it is not healthy, but I had to pursue it</td>
<td>0.80</td>
<td>0.71</td>
</tr>
<tr>
<td>There is a risk in my choice, but I am willing to take that risk, even though it is not really good for myself</td>
<td>0.83</td>
<td>0.74</td>
</tr>
<tr>
<td>Even though I know the risk of doing what I do, I would still do it</td>
<td>0.85</td>
<td>0.77</td>
</tr>
<tr>
<td>Even though I know what I do is bad, I cannot give it up</td>
<td>0.77</td>
<td>0.75</td>
</tr>
<tr>
<td>I know what I am doing is bad and harmful, but I do not take actions to change</td>
<td>0.84</td>
<td>0.81</td>
</tr>
<tr>
<td>I choose to indulge despite knowing this choice is bad for me</td>
<td>0.82</td>
<td>0.72</td>
</tr>
<tr>
<td>When I receive the health message to pursue the recommended behavior, I willingly take the risk and tell myself that “I will eventually do that”</td>
<td>0.70</td>
<td>0.64</td>
</tr>
<tr>
<td><strong>Factor 2:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Inertial Resistance to Risk Prevention (IRRP)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I ignore the risks that are described in the health messages</td>
<td>0.76</td>
<td>0.79</td>
</tr>
<tr>
<td>I did not really care that much about the effects of risks I am taking</td>
<td>0.73</td>
<td>0.71</td>
</tr>
<tr>
<td>If I read the recommended health message, I would feel disinterested, because I know I will not modify my behavior</td>
<td>0.79</td>
<td>0.73</td>
</tr>
<tr>
<td>If I read the recommended health message, I would feel insensitive, because I know I will not modify my behavior</td>
<td>0.74</td>
<td>0.70</td>
</tr>
<tr>
<td>I am going to choose this less healthy behavior regardless</td>
<td>0.82</td>
<td>0.73</td>
</tr>
</tbody>
</table>
Factor 1 is labeled “Compulsive Tendency toward Risk Taking (CTRT)” ($M = 4.12; SD = 1.79$), including eight items describing individuals taking the risky choice even if they are aware of the risks and the better options for their health ($\alpha = .90$), together capturing exhibited unwillingness to refrain from risky behaviors even if they know the negative consequences. Factor 2 is labeled as “Inertial Resistance to Risk Prevention (IRRP)” ($M = 3.38; SD = 1.68$), including five items describing individuals ignoring health messages and feeling disinterested when they read health messages ($\alpha = .88$), together capturing displayed indifference toward or intentionally ignoring health messages advocating for behavioral changes. Each subscale for Factor 1 and Factor 2 showed a high level of internal consistency. With these indicators from EFA, this two-factor 13-item instrument was presented for the next step scale test: confirmatory factor analysis (CFA).

**Confirmatory Factor Analysis**

Survey sample 2 ($n = 500$) was used for confirmatory factor analysis (CFA). To check the factor structure, CFA was performed using AMOS 23 with a 13-item oblique model to test the hypothesized factor structure from EFA. The oblique rotation, allowing for correlation between factors (Tabachnick et al., 2007), was selected due to the theoretical assumption that the dimensions of risk tolerance are likely to be correlated (e.g., Baird, 1986; Baird et al., 1987). This assumption was further verified by the significant correlation between the two factors according to their structures yielded during the EFA ($r = .75, p \leq .001$). Factor loadings from CFA for the 13 items are presented also in Table 1. Full descriptive statistics of all 13 items are included in Table 2, with a high internal consistency ($\alpha = .94$).
### TABLE 2 Descriptive Statistics of Risk Tolerance Inventory Items

<table>
<thead>
<tr>
<th>Items</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Range</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Factor 1:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Compulsive Tendency toward Risk Taking (CTRT)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I did it anyways, even though I knew it was an unhealthy choice</td>
<td>4.51</td>
<td>1.79</td>
<td>6 (Min = 1; Max = 7)</td>
<td>-.55 (SE = .08)</td>
<td>-.72 (SE = .16)</td>
</tr>
<tr>
<td>I know that what I chose is not a smart decision, and it is not healthy, but I had to pursue it</td>
<td>4.09</td>
<td>1.78</td>
<td>6 (Min = 1; Max = 7)</td>
<td>-.26 (SE = .08)</td>
<td>-.92 (SE = .16)</td>
</tr>
<tr>
<td>There is a risk in my choice, but I am willing to take that risk, even though it is not really good for myself</td>
<td>4.27</td>
<td>1.78</td>
<td>6 (Min = 1; Max = 7)</td>
<td>-.41 (SE = .08)</td>
<td>-.79 (SE = .16)</td>
</tr>
<tr>
<td>Even though I know the risk of doing what I do, I would still do it</td>
<td>4.28</td>
<td>1.75</td>
<td>6 (Min = 1; Max = 7)</td>
<td>-.35 (SE = .08)</td>
<td>-.66 (SE = .16)</td>
</tr>
<tr>
<td>Even though I know what I do is bad, I cannot give it up</td>
<td>4.00</td>
<td>1.82</td>
<td>6 (Min = 1; Max = 7)</td>
<td>-.14 (SE = .08)</td>
<td>-1.02 (SE = .16)</td>
</tr>
<tr>
<td>I know what I am doing is bad and harmful, but I do not take actions to change</td>
<td>3.85</td>
<td>1.83</td>
<td>6 (Min = 1; Max = 7)</td>
<td>-.08 (SE = .08)</td>
<td>-1.10 (SE = .16)</td>
</tr>
<tr>
<td>I choose to indulge despite knowing this choice is bad for me</td>
<td>4.26</td>
<td>1.79</td>
<td>6 (Min = 1; Max = 7)</td>
<td>-.39 (SE = .08)</td>
<td>-.85 (SE = .16)</td>
</tr>
<tr>
<td>When I receive the health message to pursue the recommended behavior, I willingly take the risk and tell myself that “I will eventually do that”</td>
<td>4.26</td>
<td>1.68</td>
<td>6 (Min = 1; Max = 7)</td>
<td>-.35 (SE = .08)</td>
<td>-.66 (SE = .16)</td>
</tr>
</tbody>
</table>
### TABLE 2 Continued.

**Factor 2:**
**Inertial Resistance to Risk Prevention (IRRP)**

<table>
<thead>
<tr>
<th>Statement</th>
<th>Mean</th>
<th>SD</th>
<th>Min; Max</th>
<th>t</th>
<th>SE</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>I ignore the risks that are described in the health messages</td>
<td>3.55</td>
<td>1.71</td>
<td>5 (Min = 1; Max = 7)</td>
<td>.09 (SE = .08)</td>
<td>-.95 (SE = .16)</td>
<td></td>
</tr>
<tr>
<td>I did not really care that much about the effects of risks I am taking</td>
<td>3.05</td>
<td>1.61</td>
<td>5 (Min = 1; Max = 7)</td>
<td>.44 (SE = .08)</td>
<td>-.67 (SE = .16)</td>
<td></td>
</tr>
<tr>
<td>If I read the recommended health message, I would feel disinterested, because I know I will not modify my behavior</td>
<td>3.45</td>
<td>1.67</td>
<td>5 (Min = 1; Max = 7)</td>
<td>.15 (SE = .08)</td>
<td>-.85 (SE = .16)</td>
<td></td>
</tr>
<tr>
<td>If I read the recommended health message, I would feel insensitive, because I know I will not modify my behavior</td>
<td>3.37</td>
<td>1.62</td>
<td>5 (Min = 1; Max = 7)</td>
<td>.28 (SE = .08)</td>
<td>-.64 (SE = .16)</td>
<td></td>
</tr>
<tr>
<td>I am going to choose this less healthy behavior regardless</td>
<td>3.49</td>
<td>1.74</td>
<td>5 (Min = 1; Max = 7)</td>
<td>.19 (SE = .08)</td>
<td>-.92 (SE = .16)</td>
<td></td>
</tr>
</tbody>
</table>
According to our CFA results, the combination of several goodness-of-fit indices demonstrated a reasonable overall fit of our estimated two-factor oblique model to the observed data, $\chi^2(60, N = 500) = 334.91, p \leq .001$ (RMSEA = .09; CFI = .93; AGFI = .91; GFI = 1.0). Thus, based on the conceptualization of risk tolerance and through both qualitative and quantitative methods, a two-factor, 13-item inventory for measuring at-risk publics’ tolerance of preventable individual health risks, using the Likert scale, was generated and recommended (see Appendix B).

**Discussion**

Strategic communication researchers have offered guidance on what, how, and when to communicate risk information (Janoske et al., 2013) as well as opportunities of advancing risk theory and demonstrating the value of strategic risk communication to senior leadership in the process of risk crisis communication (Liu & Pompper, 2012). How to inform publics about risk information, when there is a high degree of uncertainty, is still lacking (Liu et al., 2016). Essential to the quest for “knowing the uncertainty” lies with the understanding of risk tolerance, an understated psychological barrier that prohibits at risk-publics from taking risk-aversion actions for their own well-being. A further enriched conceptual and empirical foundation is needed to allow scholars and practitioners to gain more insights on how individuals cope with risk-induced uncertainty and how their risk tolerance is manifested, based on which more effective risk communication strategies may be developed.

To echo this research gap, our study took an important step toward explicating risk tolerance in risk communication by providing a refined conceptualization from multidisciplinary literature. This study is also the first in the field of risk communication to develop a scale for measuring risk tolerance of individual health risks via multi-methods (in-depth interviews, focus group, and survey datasets) and statistical procedures of psychometrics, which advances the risk tolerance theories (Slovic, 2016) at the measurement level.
In the general context of individual health risks, the scale we developed provides empirical evidence that risk tolerance can be measured by observing at-risk individuals’ behaviors of (1) habitually falling back to existing risky behaviors sustaining risky behaviors (e.g., displayed indifference toward or intentionally ignoring health messages advocating for behavioral changes) or (2) compulsively driven forward to resist behavioral changes (i.e., exhibited unwillingness to refrain from risky behaviors even if they know the negative consequences). Our study advances the theory and practice in understanding why and how people ignore recommended behaviors (Covello & Sandman, 2001) and in continuing to unearth hidden psychological forces (e.g., Chen, 2018; Paek & Hove, 2017) that can motivate at-risk publics to tolerate serious yet preventable individual health risks.

**How Individuals Tolerate Preventable Individual Health Risks**

To solve the puzzle why people do not follow recommended behaviors to reduce preventable risks, this study conceptualizes and defines risk tolerance as at-risk publics’ degree of unwillingness to overcome a preventable risk, which is proposed to be manifested in individual behaviors of sustaining risky behaviors and/or resistance to follow recommended risk-aversion actions. Focusing on individual health risk as the risk type over which individuals have control (Brady, 2012), this study develops a scale with two factors and a total of 13 items for measuring individuals’ risk tolerance (unwillingness to change risky behavior) in a health risk setting.

Prior risk communication research has predominantly focused on people’s willingness to engage in risky decision-making, which is measured by risk-taking orientation (Weber et al., 2002), or risk-taking (Ramon, 2009), which is measured based on people’s tendency to engage in behaviors that can have risk of injury, illness, and disease (Rook et al., 1990). However, these measurements for risk-taking orientation heavily rely on presenting the risky tendency itself without further identifying the varied patterns underneath individuals’ taking or avoiding of a specific risk. For instance, one person can have low risk tolerance for flu, therefore getting flu vaccination every year; in the meantime, the same
person can have high risk tolerance for smoking-related health risks and never even considered quitting smoking cigarettes. To unearth the complex psychological process the individual enacts in facing different health risks, this new risk tolerance scale not only captures the status of people tolerating risk while being aware of what to do instead, but also provides a multi-item tool to assess the degree of tolerance (unwillingness to change) individuals might have for different health risks.

Furthermore, the two factors rendered in our scale development processes, Compulsive Tendency toward Risk Taking (CTRT) and Inertial Resistance to Risk Prevention (IRRP), shed light on two interconnected risk tolerance patterns with two distinct clusters of tolerance indicators. On one hand, the CTRT factor captures the compulsive aspects of a preventable risk being tolerated, which is driven by irresistible urges for at-risk publics to take the risky behavior even if the risk-taking action is against their conscious wishes for personal health and well-being. On the other hand, the IRRP factor captures the inertial aspects of a preventable risk being tolerated, which is derived as a tendency to do nothing or unchanged existing risky behaviors, in which intentionally ignoring health messages or being indifferent to what these messages advocate are predominant manifestations. These two factors conceptually represent two opposite forces (equally powerful) that drive at-risk publics’ willingness to overcome a risk or not.

**Compulsive Type of Risk Tolerance (CTRT).** The eight-item CTRT subscale measures individuals’ self-reported degree of unwillingness to refrain from risky behaviors even if they know the consequences of not following recommended actions, which can be indicated by:

1. “I did it anyways, even though I knew it was an unhealthy choice”;
2. “I know that what I chose is not a smart decision, and it is not healthy, but I had to pursue it”;
3. “There is a risk in my choice, but I am willing to take that risk, even though it is not really good for myself”;
4. “Even though I know the risk of doing what I do, I would still do it”; “Even though I know what I do is bad, I cannot give it up”;
5. “I know what I am doing is bad and harmful, but I do not take actions to change”; 
6. “I choose to indulge despite knowing this choice is bad for me”; and 
7. “When I receive the health message to pursue the recommended behavior, I willingly take the risk and tell myself that ‘I will eventually do that.””

Inertial Type of Risk Tolerance (IRRP). The five-item IRRP subscale focuses on gauging individuals’ self-reported level of indifference toward or intentionally ignoring health messages advocating for behavioral changes, which can be observed via:

1. “I ignore the risks that are described in the health messages”;  
2. “I did not really care that much about the effects of risks I am taking”; 
3. “If I read the recommended health message, I would feel disinterested, because I know I will not modify my behavior”; 
4. “If I read the recommended health message, I would feel insensitive, because I know I will not modify my behavior”; and 
5. “I am going to choose this less healthy behavior regardless.”

Noting that there are several additional concepts (e.g., interest, sensitivity, etc.) emerged as potential sub-concept to be further untangled and examined as either another layer of risk tolerance or identified as potential determinants that are particularly influential in forming an inertial type of risk tolerance.

These two factors contribute significantly to the conceptual and operational definitions of risk tolerance and how it differs from existing similar concepts, such as risk taking and risk acceptance. It confirms the core of our conceptualization of individual
risk tolerance of preventable health risk as *degree of unwillingness to overcome a preventable risk that threatens at-risk publics’ own health, safety, and/or well-being*. Risk tolerance, according to our study, is found to manifest in different forms of individual behaviors: (a) sustaining risky behaviors, (b) ignoring risk prevention recommendation, (c) co-existence of both (a) and (b). These observations seem to imply that at-risk publics’ decision on whether to tolerate a preventable risk (or not) can determine whether (and if so, to what degree) certain risky behavior change is either enabled or inhibited at individual level.

**Implications for Risk Communication Practice**

For risk communication practitioners, with the role of selecting the most appropriate channel and design the most effective content to reach out to at-risk publics with accurate information (Park & Avery, 2018; Park et al., 2019), evidence-based insights on the level of risk tolerance among specific publics toward a given risk issue have significant implications for more effective tailoring of risk communication messages for different health risk types. For example, when practitioners know, or are able to predict, which group of individuals might have higher or lower risk tolerance level toward a given health risk, they can plan more strategically in terms of which message characters should be used in order to overcome psychological barriers that create blockages that reduce the effects of health persuasion. With its established validity and stability, the risk tolerance scale is now ready to be used by practitioners for gauging at-risk publics’ level of unwillingness to overcome a preventable risk with a relatively short list of items.

The risk tolerance scale developed and tested in this study offers a psychometric tool that can be utilized by practitioners in capturing the multiple facets of individuals’ unwillingness to change risky behavior, which can be useful to track and predict at-risk publics’ risk tolerance in order to develop the most effective health communication campaigns. Additionally, risk tolerance can be measured either as a trait of at-risk publics, to be gauged before risk messages are crafted, or as a state-based measure used to track at-risk publics’ responses (or overtime response changes)
to risk messages. Being able to measure risk tolerance, risk communication professionals’ capacity to draw insights from behavioral research is expanded, which allows them to further design counter-messages that will help break down the risk-tolerance based barrier, particularly at a local level (Novak et al., 2019), thus increasing at-risk publics’ willingness to follow the recommended preventive or protective actions and modify their risky behaviors accordingly (Avery, 2019; Reynolds & Seeger, 2005).

Limitations and Future Directions

As the first study to develop a multi-item scale to specifically measure how individuals tolerate preventable and individually controllable health risks, this study advanced the explication of risk tolerance in the context of risk communication. However, it has several limitations that need to be addressed by future research.

First, some of our fit indices could be considered as a mediocre fit. For instance, our RMSEA is .09, and the recommendation for RMSEA cut-off points have been reduced in recent publications (Hooper et al., 2008; Hu & Bentler, 1999; Steiger, 2007). However, MacCallum and his colleagues (1996) acknowledged RMSEA in the range of 0.05 and 0.10 as an indication of good fit. One of the reasons why our RMSEA could not be lower than .09 can be based on the lack of normality of our data (Curran et al., 1996).

Second, although the conceptualization of risk tolerance posited by this study can be applied to both individual health risk and disaster risk types (Brady, 2012), the current scale itself is developed in the context of individual health risk. Since it was purposefully developed for a wide spectrum of individual health risks, how it may apply to measuring individuals’ risk tolerance of a given risk in a specific context is one of the next steps to be taken by risk scholars. Furthermore, it is unknown whether the scale might apply to disaster risk type over which individuals have no or little control (Brady, 2012). In addition, whether the two clusters of risk-tolerating behaviors (i.e., risk taking despite knowing the consequences versus indifference to health messages) will emerge in disaster risk communication is yet to be further examined. Nevertheless, we posit that, some, if not all, items might be applied in the
context of natural disasters (such as earthquakes and hurricanes) and/or manmade disasters (such as terrorist attacks), while new items or updated factor-structure might emerge from studies in disaster-specific contexts. Additionally, this study’s scope is within the sphere of a layperson’s risk perception and potential risk reaction (e.g., to take or not to take risk prevention as recommended by experts and/or government health authorities). To complete the picture and include all key players in tackling the challenge of preventable health risks, the risk tolerance concept and the current scale need to be further refined and expanded toward an advanced understanding of how medical experts and public health practitioners may use it to assess at-risk publics’ risk tolerance and overcome it by motivating more preventive behaviors.

Third, future studies can help improve the external validity of the risk tolerance survey. We used the term “at-risk publics” to refer to any individuals threatened by any risk concerning their well-being. Although we sampled from the general U.S. population, each individual participant is “at-risk” of the threat caused by the focal health risk they were instructed to identify and focus on throughout the survey. Specifically, the survey instruction of the study asked participants to think of a health issue based on the three criteria (i.e., the issue is concerning to them, they are aware of ways to overcome this risk by modifying their behavior, and they choose to tolerate the risk regardless). However, our survey instrument did not measure level of concern, which might have created variances in how participants perceived each health risk on their mind and how they chose to tolerate it. To further test the scale, two additional individual characteristic based variables that need to be taken into consideration in future risk tolerance studies are: (1) at-risk publics’ self-efficacy in modifying their risky behavior, as suggested by the social cognitive theory (Bandura, n.d.) and (2) their level of trust of certain health organizations who disseminate health information (e.g., the Centers for Disease Control and Prevention [CDC]), which is built through continuous emotional involvement (Engdahl & Lidskog, 2014) and may trigger individuals to decrease their risk tolerance and quickly modify their behavior when facing an acute risk or a health emergency. Both self-efficacy and trust can function as antecedents or covariates
that lead to or help explain varied individual tolerance of a preventable health risk.

Fourth, this study only focuses on one concept, risk tolerance. Further predictive, discriminant, and convergent validity analyses are needed to examine to what degree and in what ways risk tolerance is different from other concepts (e.g., risk taking and risk acceptance), not only conceptually but empirically in predicting and/or explaining risk outcomes. How individuals’ decisions on whether to tolerate a preventable risk (or not) might determine whether (and if so, to what degree) certain risky behavior change is either enabled or prohibited at an individual level needs to be examined in future multivariate studies. On one hand, the current risk tolerance scale can be used as one of the dependent measures (as outcome variables, mediator, or moderator) in studying the effectiveness of risk communication and how risk tolerance is related to other risk-tendency related concepts, such as risk desensitization, message fatigue, and social comparison theory. On the other hand, the concept of risk tolerance can be measured directly and applied to studying other preventable risks in not only individual health but also in environmental health (e.g., air pollution) and vaccine communication (e.g., flu vaccination hesitancy) as an antecedent or covariate of outcome variables essential to these risk domains.

Last but not least, the current conceptualization and measurement of risk tolerance apply solely on individuals who themselves are confronted by a risk that threatens their own health and well-being, which may not apply to individuals who are decision makers for others’ health (including tolerating risk prevention for the benefit of others). In the example of getting HPV as a health risk to teenagers, parents (not teens themselves) are directly making decisions for their children’s HPV vaccination: If parents are postponing getting an HPV vaccine for their children, then the parents’ risk tolerance should be measured as they are the ones making the decision to tolerate the risk of their child getting HPV. Future studies in such preventable health risks should use or modify the current risk tolerance scale to gauge not only the tolerance of at-risk publics’ but also that of the decision makers of at-risk individuals regarding certain risks.
In summary, this study is a significant step toward defining risk tolerance in risk communication and developing a valid and reliable measurement of at-risk publics’ tolerance of individual health risks. The insights from this study reflect Liu et al.’s (2016) argument that knowing how much inherent uncertainty publics perceive in risk communication serves as key for practitioners to communicate effectively to at-risk publics, which also paves the way for future studies to continue unearthing and overcoming risk communication barriers in order to enhance risk message effectiveness.

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Appendix A

Initial Item Pool for Risk Tolerance Scale Development

(1) I understand that there is higher risk if I keep doing this and not following the recommended behavior, but I had to do this anyways;
(2) I did it anyways, even though I knew it is an unhealthy choice;
(3) I keep putting it off to follow that recommended behavior;
(4) I know that what I chose is not a smart decision, and it is not healthy, but I had to pursue it;
(5) I thought I could take only small responsibility while I was not following the recommended behavior, even though I knew it’s obviously bad for me;
(6) I kept meaning to pursue the recommended healthy behavior, but I kept putting it off;
(7) I was aware that there was a real possibility that I was going to be less healthy, if I kept putting it off to behave healthy;
(8) There is a risk in my choice, but I am willing to take that risk, even though it is not really good for myself;
(9) I feel like I need to lose the healthiest choice, as a pay-off, to achieve my goal;
(10) I do not mind taking the risk of not following the recommended behavior;
(11) Even though I know the risk of doing what I do, I would still do it;
(12) I just ignore the recommended healthier behavior, because I already know that I am not going to do it;
(13) I just ignore the recommended healthier behavior, because it does not affect me;
(14) When I receive the health message to pursue the recommended behavior, I willingly take the risk and tell myself that “I will eventually do that”;
(15) I know that I will eventually follow the advice, but just not right now, where deep down I know that I probably will not follow the advice;
(16) When I read about the recommended behavior that I am supposed to follow, I become defensive;
(17) When I read about the recommended behavior that I am supposed to follow, I blame the publisher of the article to doubt if it is the right source;
(18) When I read about the recommended behavior that I am supposed to follow, I look for evidence for the other side to back up my behavior;
(19) I feel like I am still avoiding bigger risk by choosing what I do, even though it is not the healthiest behavior;
The Conceptualization of Risk Tolerance and Scale Development

(20) The risks that I do not mind tolerating as much are those that I see as less risky;
(21) I tune out for the risks I am taking;
(22) I take the less healthy choice, because I feel like I need it;
(23) I am not worried about having higher risks just because I did not take the recommended behavior;
(24) Even though I know what I do is bad, I cannot give it up;
(25) I know what I am doing is bad and harmful, but I do not take actions to change;
(26) Whenever I have sickness, I do not take time to go to the doctor, because I know I will get over it eventually;
(27) Taking time to go to the doctor just is not a priority, when I feel sick;
(28) I often sacrifice my own health for the other choices I am making;
(29) I ignore the risks that are described in the health messages;
(30) I ignore my doctor’s advice;
(31) I did not really care that much about the effects of risks I am taking;
(32) If I read the recommended health message, I would feel disinterested, because I know I will not modify my behavior;
(33) If I read the recommended health message, I would feel insensitive, because I know I will not modify my behavior;
(34) If I read the recommended health message, I would feel insensitive, because I know I will not modify my behavior;
(35) Even though I know there are high safety risks, I would still take my current behavioral choice;
(36) I have got nothing to do about changing my behavior into a healthier way;
(37) I am still going to choose what I have done so far, because I am used to it;
(38) I am more focused on how much benefits I can get from my choice than the negative health risks;
(39) I do this less healthy behavior, even though it is not good for me;
(40) I am going to choose this less healthy behavior regardless;
(41) Sometimes, I just think I will deal with the consequences of these health risks later;
(42) Healthier choices are pushed out of the order of priority;
(43) Even though I am aware of the health risks of the choice I pursue, I chose to take the benefits of my choice over other healthier choices;
(44) After considering the benefits and risks of my choices, I decide that the benefits outweigh the risks;
(45) I choose to indulge despite knowing this choice is bad for me;
(46) I did disregard the messages from the health campaigns recommending me to change my choices;
(47) I resist pursuing healthier choices for myself;
(48) When I choose my decision, I take my less healthy choice and weigh it against the recommendation;
(49) I usually behave in healthy way, but at times, I tend to take less healthier choices that I know they are not healthy for me;
(50) I ignored the health messages and decided to keep what I have been doing;
(51) I knew the risks of my choices, but the benefits of my choices spurred me on;
(52) I know that there are less risky choices for my health, but I ignore them purely for benefits’ sake;
(53) I do understand that what I have been choosing contains a risk, but I do not think I do it too often for it to be a concern.
Appendix B

Recommended Individual Health Risk Tolerance Scale

Instruction: Please indicate your level of agreement or disagreement with each of the following statements, which describe what you do (or not do) about [a preventable health risk you yourself are currently facing or are likely to face in the future]. Each item is measured using a 7-point Likert-type scale ranging from “1 = Strongly Disagree” to “7 = Strongly Agree.”

Subscale 1: Compulsive Tendency for Risk Taking (CTRT)

- I did it anyways, even though I knew it was an unhealthy choice.
- I know that what I chose is not a smart decision, and it is not healthy, but I had to pursue it.
- There is a risk in my choice, but I am willing to take that risk, even though it is not really good for myself.
- Even though I know the risk of doing what I do, I would still do it.
- Even though I know what I do is bad, I cannot give it up.
- I know what I am doing is bad and harmful, but I do not take actions to change.
- I choose to indulge despite knowing this choice is bad for me.
- When I receive the health message to pursue the recommended behavior, I willingly take the risk and tell myself that “I will eventually do that.”

Subscale 2: Inertial Resistance to Risk Prevention (IRRP)

- I ignore the risks that are described in the health messages.
- I did not really care that much about the effects of risks I am taking.
- If I read the recommended health message, I would feel disinterested, because I know I will not modify my behavior.
- If I read the recommended health message, I would feel insensitive, because I know I will not modify my behavior.
- I am going to choose this less healthy behavior regardless.
Victims as Stakeholders: Insights from the Intersection of Psychosocial, Ethical, and Crisis Communication Paths

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ABSTRACT
This article examines the position of victims and those affected within communication theory. Current research has broadly been skewed toward reputation management and protecting brand value as primary goals of crisis communication efforts. As crises affect real people, crisis communication theory needs to be adapted to include their needs. To assure their needs are met, an integration of business ethics and psychosocial mechanisms in the field of crisis communication is proposed. This integration prevents crisis communication output from becoming an additional source of stress to the affected in the aftermath of crises. We offer recommendations for crisis communication scholarship to be inclusive and beneficial to victims and the affected in the aftermath of crises.

KEYWORDS: victims, psychosocial, aftermath, remembrances, ethics of care

Crises and disasters such as terrorist attacks, earthquakes, airplane crashes, and hurricanes cause serious psychosocial harm to exposed individuals and put families, neighborhoods, and communities at risk (Bonanno et al., 2010). Typical effects include stress, fear, uncertainty, physical symptoms, and trauma-related mental health problems (Dückers et al., 2017). Even though the first priority in crisis management and crisis communication...
should be to help victims and protect potential victims from harm (Coombs, 2007; Coombs & Holladay, 2007; Sturges, 1994), this dimension of crisis communication has received little attention in the crisis communication literature. The field turns out to have a “managerial bias” (Waymer & Heath, 2007), with a focus on reputation and American corporate case studies (Arendt et al., 2017). On a day-to-day business, restoring the reputation of the organization and the trust of customers or other stakeholders is considered as the “foremost goal of crisis communication” (Utz et al., 2013). Over the years, protecting brand reputation and brand value became the focal point of crisis response strategies, while the role of affected victims seems to be diminished. The needs of victims in crisis communication scholarship is often minimized to apologies (Coombs & Laufer, 2018) and expressions of sympathy.

However, from psychosocial literature, we know that victims look for acknowledgment of the difficult situation they find themselves in (Maercker & Müller, 2004). Providing meaning to something can have a positive effect on people’s resilience and recovery from stressful events as well (Park, 2016). Providing meaning to a horrible situation in a broader context is usually considered as one of the public leadership tasks, in which the broader impacts of a crisis are communicated to citizens, the media, and other stakeholders (Boin et al., 2005; Jong, 2017). As such, providing meaning can be regarded as another form of expressing sympathy to victims and the affected. Well-known examples are the performances of public leaders like Mayor Giuliani after 9/11 or Prime Minister Ardern of New Zealand in the aftermath of the Christchurch mosque shooting. Finding words on behalf of the government is not solely driven by reputations or the perspective of future elections, but has a more public-oriented goal, which is to strengthen society, provide hope (Noordegraaf & Newman, 2011; Pennebaker & Lay, 2002), and call upon resilience and pride (De Bussy & Paterson, 2012). As part of his situational crisis communication theory (SCCT), Coombs (2010) states that victims not only should be provided with an expression of sympathy, but also with information about corrective actions, and trauma counseling when needed. Although it is hard to define corrective action and trauma counseling as part of the realm of crisis communication...
per se, the way in which crisis communication should live up to the expectations of victims beyond the expressions of sympathy remains unclear.

This is important, as case studies show that victims sometimes expect more than sympathy, corrective action, or trauma counseling. Recently, Boeing had a hard time in 2018 and 2019, as their brand-new Boeing 737 Max plane experienced fatal crashes on two occasions. After the second crash in Ethiopia, the Boeing company expressed its deepest sympathies to the families and loved ones of those who lost their lives in the accident (Boeing, 2019). The wording was similar to its statement after the first crash in Indonesia. In a *New York Times* article (*New York Times*, 2019), relatives expressed their disappointment in the company, as Boeing did not learn from the first incident. According to them, it was “absolutely inexcusable that it takes another crash for people to kick this investigation and improvements into high gear.” The example shows that victims can be influential stakeholders who sometimes voice their specific needs. On this occasion, they needed more than just condolences. They wanted Boeing to show that it learned from the accident.

It is a challenge for crisis communication scholarship to align victim-oriented communication with reputation-driven communication, as both ask for rather different requirements in communication. Crisis communication that is beneficial for the restoration of a corporate reputation has different goals than the sole well-being of victims. Heath (2010) explains why victims might judge a situation differently compared to an organization, when faced with a crisis. He gives the example of victims (individual and community) of a deadly mining operation, to whom it may be more of a crisis than it is for the owners and managers of the company. As long as crisis communication research tends to focus on the reputation of the mining company, the well-being of victims and their next of kin might be overshadowed. Alternatively, the needs of victims cannot be regarded as more important than reputation.

We argue that crisis communication has an ethical duty to support victims who cope with the consequences of a crisis and find ways in which it fits within the broader attempt to restore reputations. This implies that communicative awareness is warranted
to better understand the needs of victims and how crisis communication as a practice can contribute to fulfilling those needs. Otherwise, without such awareness, the output of crisis communication might become an additional source of stress and trigger negative consequences to people who are faced with a crisis or disaster. As in Heath’s (2010) example, the focus on the reputation of the mining company overshadows the needs of the coworkers from the mining company. Such sources of stress go beyond short-term conflicting or unclear messages from authorities and experts, which are considered to enhance temporary uncertainty and worry among the public (Gouweloos et al., 2014). Our goal is to take it one step further and assess the potential contribution of crisis communication to prevent long-lasting, individual, and psychosocial problems in the aftermath of tragic events.

This article aims to integrate psychosocial principles into crisis communication theory, which enables practitioners to lower experienced stress among victims. Additionally, we aim to generate more depth to the “expression of sympathy” and develop a set of communicative interventions that support victims in times of crisis. In short, the goals are as follows: (1) to define and extend our understanding of the interests of those directly affected in times of crisis and (2) to make communicative recommendations for when an organization, either public or private, is faced with people who suffer from an incident or crisis. First, an overview is given of the current literature on the overlap between business ethics, psychosocial, and crisis communication literature. Then, an outline is given for a series of building blocks to apply psychosocial principles to crisis communication. These building blocks support communication practitioners who might otherwise underestimate the needs of individual victims. Finally, directions for further research are described.

**Ethics of Care Perspective**

In order to intertwine reputation-driven communication with victim-oriented communication, there is a need for a stakeholder approach that balances economic, financial, and reputational consequences with the interests of the directly affected. An ethic of
care approach, as initially outlined by Gillian (1982), emphasizes how one’s actions may impact the feelings of others (Bauman, 2011). As such, it scans the environment on the impact of a crisis among stakeholders and provides a caring response which ultimately strengthens the relationship between the corporation and its customers. This is similar to Marynissen and Lauder’s (2020) argument that the communication strategy has to prioritize the concerns raised by those involved in the crisis. In their case study on the Brussels terror attacks in March 2016, they describe how the federal crisis center addressed these concerns in their communication approach (Marynissen & Lauder, 2020).

From this perspective, the organization under crisis takes care of its responsibilities to others, not because it is legally obliged to do so, but because they voluntarily want to act (Simola, 2003). In the ethics of care approach, the organization acknowledges the harm, apologizes, and acts to resolve the problem (Bauman, 2011; Diers-Lawson & Pang, 2016). As Bauman notes, the level of care required to effectively manage a crisis remains an open question. It is not likely that there is a “one size fits all” approach, as everyone experiences a crisis situation differently. The particular setting of private, personal, and public life influences the way in which people experience the impact of a crisis and the meaning they assign to an event (Jong & Dückers, 2019). These perceptions might change over time (Dyb et al., 2014; Perry and Lindell, 2003).

Even though the concerns and expectations might differ from one victim to another, the type of concerns can be generalized. To get an impression of the needs of those who became a victim of a crisis, we turn to Hobfoll et al. (2007) who developed a psychosocial model for supporting those who have experienced traumatic events. Their model is widely used within the psychosocial domain and includes the recommended prevention approach in the immediate aftermath of events, before clinically significant psychiatric symptoms emerge (Neria & Shultz, 2012). According to Hobfoll et al. (2007, p. 285), there are five so-called “essential elements” that are beneficial for the well-being of the affected. These “essential elements” are widely referred to as elements that support victims to recover from stressful events. These are the promotion of a sense of safety, calmness, self- and community
efficacy, connectedness to others, and hope. Further minimization of sources of stress to victims implies that crisis communication should incorporate these essential, psychosocial elements in its approach. Translating these essential elements to the domain of crisis communication enables us to contribute to a caring response and to fulfill the needs of the affected.

**Hobfoll et al.’s Principles as Building Blocks for Crisis Communication**

Our objective is to enable crisis communication practitioners to work along the lines of these psychosocial principles through the lens of an ethics of care perspective. For this reason, we translate Hobfoll et al.’s (2007, p. 285) “essential elements” to a crisis communication setting in more detail and illustrate them with examples. In doing so, one has to realize that crisis communication can contain more than one element at once. By incorporating the elements in this approach, they can work as building blocks for coherent and consistent crisis communication which incorporates the ethics of care perspective.

**Promote a Sense of Safety**

According to Hobfoll et al. (2007), statements made can support a sense of safety. Transferred to communication practice, communication about the lessons learned from a crisis can support victims to cope with the situation. Is the organization open to communication with the affected? Do the affected feel supported by the organization and others, or do they feel left alone in their own sorrow? Only direct contact with victims or their representative groups enables organizations to prevent tensions from arising in the aftermath of the event, rooted in differences of expectations. Support in media management after crises is another field where organizations can contribute to lower distress among the affected. Restraint in media coverage might help them to limit unwanted exposure for those who are hesitant to share their personal grief in the public arena. Kwesell and Jung (2019) conclude, based on an analysis of the aftermath of the Fukushima nuclear (2011) disaster, that crisis communication experts should put immediate
focus on local media and encourage them to take on active roles to overcome negative effects by the mainstream media's framed stories. In other cases, one might think of supporting victims in media management. This support includes advising victims who consider giving media interviews and pointing out the long-lasting effects of venting frustration on social media. Not necessarily in the interest or in cooperation with all victims, several disasters have been made into feature-length movies. Discussing pros and cons of such movies with the directly affected seems key, as it often stirs controversy and debate, and scholars, victims, and the public disagree amongst themselves about when (if ever) is a good time for such a movie to be released. In 2018, several movies and a TV series depicted the terror in Norway. *Utoya 22 July* by Erik Poppe was first shown to members of a support group so that they could see it—and advise others—before its main release. Promoting safety implies communicating with all parties involved and support them in anticipating on developments in the aftermath (e.g., court cases, investigation reports). Be aware of the impact of commemorations and remembrances, anticipate “anniversaries,” and show that the organization cares about all different opinions on the road ahead.

**Promote Calming**

Regarding the promotion of calming, effective messages include: “You are neither sick nor crazy; You are going through a crisis; You are reacting in a normal way to an abnormal situation” (Hobfoll et al., 2007, p. 291; see also Solomon, 2003). The New Zealand government set up a national response and recovery plan after the Christchurch Mosque shooting, where communication efforts were made to promote population level well-being and offer access to support for survivors and their families (New Zealand Ministry of Health, 2019).

There is a need for guidance regarding what will happen next. Most victims are in a completely new situation and often have many concrete questions about the next steps, including when they will be informed about the status of their loved ones, what will happen to personal possessions, and how the process of
identifying remains works. Part of this process includes acknowledging uncertainty, as Prime Minister Rutte from The Netherlands did during the COVID-19 crisis. In one of his press statements, he stressed that the government had to make 100% of the decisions with 50% of the knowledge.

Calming can be promoted by means of a physical family assistance center, as it can function as a “one-stop-shop” providing vital information for victims of the disaster (Brataas, 2018, p. 140). This applies not only to the public sector, but to the commercial sector as well. A best practice to consider is the action of the Norwegian oil company Equinor, which experienced a major crisis in 2013 when many of its employees in In Aménas, Algeria, were taken hostage. Equinor set up a family assistance center at a local hotel in Norway and invited family members of those missing to come and stay for as long as needed. After a short while, Equinor took over the whole hotel, and senior staff from Equinor—occasionally including the CEO—gave hourly briefings about the situation. This action was later praised by officials and families and proved that crisis communication, crisis leadership, and psychosocial support need to interact for optimum effectiveness (Brataas, 2018).

Calmness also includes organizations sticking to the promises they made, as victims want to know what they can expect in the near future. As a crisis winds down, it can be important to acknowledge victims in their wish to understand why a crisis occurred (Jong, 2019) and to inform them personally as soon as a final investigation on the cause of a crisis is made public. Such a report will possibly function as closure to the public, which asks for a well communicated process to help alleviate continuing anxiety and encourage the return to a state of normality (Baubion, 2013).

Promote a Sense of Self- and Collective Efficacy
Activities set up by communities may contribute to a sense of collective efficacy. Communities and colleagues play a role by helping victims to self-organize, collectively make sense of a crisis, and reproduce community experiences (Xu, 2018). Resources are needed to encourage empowerment; otherwise initiatives can be counterproductive and demoralizing. Support groups can act as
venues for peer support and collectively gathering information and deciding on a collective way forward for those affected. One topic of discussion might be a monument to memorialize the tragedy. The process of deciding on whether to establish a permanent memorial and subsequently on its design often leads to political and sensitive discussions (de Roy van Zuijdewijn, 2019), which can be a long-lasting and sometimes frustrating task to agree on. It fits with a call by Austin et al. (2014), who emphasize the need for repairing symbolic and physical damage and bringing forth victims’ voices in the aftermath.

Efficacy might be stimulated through charities as well. Charities in the wake of a tragedy are probably more common in the U.S. than elsewhere in the world. They can mean a new beginning for victims and, if handled correctly, a charity can become a symbol for a city united and people willing to help each other. One of the best examples is the One Fund Boston, which was initiated less than 24 hours after the terror attack on the Boston Marathon. It received more than USD 80 million from 200,000 individuals, groups, and businesses.

In their analysis of the Fukushima nuclear disaster (2011), Kwesell and Jung (2019) propose that disaster response and communication strategies should include ways for residents to talk openly about their difficulties, uncertainties, and frustrations. This would allow victims to share information in a safe space, voice anxieties and concerns, and come to some agreement on strategies moving forward.

**Promote Connectedness**

Promoting connectedness involves more than online forums where the affected can meet. In their study, Procopio and Procopio (2007) specifically stressed the importance of offline communication, which seems more efficient in building and strengthening the weak ties in each community or a social business-oriented network among colleagues. It includes facilitating and attending memorials and remembrances, which enable those affected to meet each other. The National September 11 Memorial & Museum in New York is perhaps the largest and most well-known example,
but other recent monuments include the Atocha station memorial in Madrid and the 7 July Memorial in Hyde Park in London (de Roy van Zuijdewijn, 2019). Remembrances are held throughout the world regularly as well. As an example, Spain’s King Felipe has led a ceremony in Madrid to honor the almost 30,000 people who have died from the COVID-19 pandemic in the country, while German Chancellor Angela Merkel attended a ceremony 1 year after the Berlin terrorist attack. The intensity of such gatherings varies. Some officials attend local remembrances year after year, such as the Mayor of London and the head of the Metropolitan police who lay wreaths at a memorial to the 7 July attacks in Hyde Park, London, while others only attend specific anniversary years.

Apart from remembrances, there are many other examples of this theory in practice, such as a variety of support groups that formed after disasters with the fundamental purpose to make changes and to ensure that a similar tragedy will not happen again. Sometimes their actions are so forceful that laws change—as was the case in the U.S. in the 1990s when support groups after airline accidents led to The Aviation Disaster Family Assistance Act of 1996 and the Foreign Air Carrier Family Support Act of 1997.

**Promote Hope**

The concept of “hope” fits within the recent discourse of renewal research. This theory states that circumstances can ask for a prospective outlook that emphasizes positive change during the post-crisis period (Wombacher et al., 2018). The post-crisis discourse of renewal is characterized by four dominant features: prospective focus, the opportunities inherent in the crisis, provisional rather than strategic responses, and ethical communication grounded in core values (Seeger & Ulmer, 2002; Seeger et al., 2005; Ulmer & Sellnow, 2002). The ethical communication agenda of the discourse of renewal is value-driven and refers to acting in a manner consistent with general social values before, during, and after the crisis (Ulmer et al., 2007).

Hope can be provided on both a community and an individual level. Aforementioned De Bussy and Paterson (2012) assessed the communicative styles of public leaders after floods in Queensland, Australia. During the floods, Queensland Premier Anna Bligh
provided hope to her citizens. In her statements she stressed that it does not matter where people live, whether it is in the capital city or the tiniest country towns, every single person affected by this event is going to be looked after and “won’t be forgotten.” While this example refers to providing hope to a community under stress, crisis managers can also offer hope on a more individual level. When an organization shows that it has truly learned from a crisis, this helps the affected in the sense that it did not happen “for nothing.”

**Implications for Practice**

As a first step, we combined the needs of victims, expressed in psychosocial principles of the five so-called “essential elements” (Hobfoll et al., 2007) with crisis communication practice. On the following page, Table 1 summarizes the recommendations for aligning the elements and crisis communication. The lessons are clustered according to the five principles in order to guide practitioners to fulfill a communicative role in the provision of psychosocial support.

Taking care of the needs of victims is, of course, beneficial to them. To decide the level of care that is needed, organizations should reach out and discuss expectancies with individual victims and those affected. Such a conversation activates a range of relevant stakeholders with divergent voices, where the organization needs to ensure that the voice of none of these stakeholders is inhibited (Simola, 2003). The approach does not necessarily conflict with communication goals based on reputation management and can be beneficial to the organization involved as well. Simola describes a case study on crisis management by McDonald’s after a fatal shooting at the San Ysidro, California, McDonald’s restaurant in 1984. The company invested in its relations with the community and took care of them in the aftermath. Again, not because it was legally obliged to do so, but because it voluntarily wanted to act. Although the expressed goal of McDonald’s Corporation was not reputationally driven, the ethic of care that it demonstrated during a time of horrific pain and suffering was appreciated by the public and press (Simola, 2003). The process of listening to and acting upon the needs of victims is not an easy task and takes time.
### TABLE 1  Communicative Contributions Applied to Hobfoll et al.’s (2007) Essential Elements

<table>
<thead>
<tr>
<th>Category</th>
<th>Recommendations for Crisis Communication Practitioners</th>
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| Sense of safety                   | • Share what the organization learned from the tragedy  
• Restraint in media coverage or support the affected in media management  
• Prevent or limit unwanted exposure (such as movies and TV series)  
• Keep direct contact with victims or their representatives throughout the aftermath  
• Coordinate commemorations and remembrances  
• Show that the organization cares about all different opinions among victim groups |
| Calmness                          | • Support mental health messages  
• Stick to promises made  
• Address concerns  
• Guide them and tell them what will be the next steps in the process  
• Provide vital information in an easily accessible manner |
| Self- and community efficacy      | • Stimulate self-organizing communities or colleagues with empowering communication  
• Consider support for a monument to memorialize the tragedy to bring forth victims’ voices  
• Consider support in fundraising to mark a new beginning in the aftermath |
| Connectedness to others           | • Provide meaning and describe the shared feelings among victims and the affected  
• Enable victims to share their thoughts in a safe environment (Kwesell & Jung, 2019)  
• Discuss communicative needs in terms of connectedness, both online and offline  
• Facilitate attending memorials and remembrances |
| Hope                              | • Communicate a prospective outlook to emphasize positive change when suited (see discourse of renewal, e.g., Seeger & Ulmer, 2002)  
• Be consistent in communicating values before, during, and after the crisis  
• Show that the organization learned from the crisis and it did not happen “for nothing”  
• Be transparent and accessible by just being there and using well-chosen words to support victims in their suffering |
Experience from Norway shows that stakeholders sometimes need time to change their mind and align with the steps taken by others. Families who did not participate in the construction of a memorial after the Utøya shooting asked to have the names of their relatives added, shortly after the memorial site was opened (de Roy van Zuijdewijn, 2019).

**Future Directions**

From the point of view of the affected, image restoration and restoring the brand value of the organization under crisis is not a priority they are interested in. After having survived an airplane crash, survivors might develop a negative brand image of the airline at stake, although it is more likely that they develop a general fear of flying that is not aimed at one brand specifically. Even more importantly, apart from fear, they might suffer from stress, uncertainty, physical symptoms, and trauma-related mental health problems in the aftermath of crises.

In their commentary, Liu and Fraustino (2014, p. 546) raised the fundamental question: “What is the goal of our scholarship?” We believe that bridging the commercial and reputational interests of organizations and the more private interests of the directly affected is one such goal. We echo Hayes et al.’s (2017) call to come to a new paradigm, as current typologies of crisis response fail to account for organizations’ moral or professional obligation to respond to support the well-being of victims. Such a new paradigm supports organizations in their efforts to integrate a more resilience-oriented type of crisis communication and support communities to survive and revive in the event of a crisis (e.g., Olsson, 2014).

A focus on brand image without taking care of the needs of victims and their families creates additional and unnecessary sources of stress to them. It is an ethical duty of our scholarship to incorporate the interests of the directly affected in crisis communication and create caring and valuable communication toward all stakeholders. While image restoration strategies might be helpful to other audiences (e.g., network partners, shareholders, customers), reputational strategies are counterproductive when targeted to victims and the affected as a specific group of stakeholders.
The psychosocial principles, introduced by Hobfoll et al. (2007), are a guide for those organizations that want to adopt the ethics of care perspective in their communication after tragic events. Whatever direction is taken, it implies a long-lasting commitment to victims in terms of crisis communication.

Additional research should further focus on the specific psychosocial needs of the affected, the role of these needs within the broader discourse of crisis communication, and how to align them with the interests of other stakeholders of organizations under crisis.

**Conclusion**

Current crisis response strategies tend to focus on “image restoration” as their primary goal, where protecting the reputation and brand value seem key. Using such strategies might give practitioners the false impression that the support for victims is limited to an expression of sympathy, providing information about corrective actions, and referring to trauma counseling when needed. From an ethics of care perspective (Simola, 2003), organizations should look beyond what they are legally obliged to do. This asks for organizations to listen to victims and their next of kin, and show that they voluntarily want to act upon their needs. Such a process of listening and acting is not an easy task and takes time. But demonstrating and communicating from an ethic of care approach during times of crisis is likely to contribute to the well-being of victims and their next of kin.

When the ethics of care perspective is applied to crisis communication, it deepens our understanding of the merits of *expressing sympathy*. The current study claims that the crisis communication approach of *expression of sympathy* is multilayered and can be further detailed on the basis of five essential elements of immediate and midterm mass trauma intervention (Hobfoll et al., 2007). The communicative recommendations proposed in Table 1 can be regarded as communicative interventions to prevent or lower stress, fear, uncertainty, physical symptoms, and other trauma-related mental health problems among victims and their families.
Victims as Stakeholders

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Focusing on the “Public” in Public Relations: The Importance of Person-Centered Messages (PCMs) in Crisis Communication on Twitter

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ABSTRACT

Based on the theoretical frameworks of situational crisis communication theory (SCCT) and person-centered messages (PCMs), this interdisciplinary study conducted a 2 x 3 experiment to examine the role of PCMs in crisis management on social media. Our findings suggest that crisis type (victim, preventable) has an effect on people’s perceptions/reactions toward an organization and that PCM levels (low, medium, and high person-centered messages) in crisis communication on social media influence organizational reputation and participants’ intention to post negative feedback about the organization in crisis. We suggest that when organizations are responding to crisis online, they provide additional attention to the interpersonal dynamics of those interactions. Theoretical and practical implications are discussed.

KEYWORDS: situational crisis communication theory, person-centered messages, social media, crisis communication

Within the past several years, multiple airlines have experienced major crisis events. For example, on April 7, 2017, Dr. David Dao boarded a United flight but was dragged through the aisles when he refused to voluntarily give up his seat due to overbooking (Goldstein, 2017). While Dr. David Dao’s experience is notable, it unfortunately did not occur in isolation as a growing number of
Public relations (PR) crises are occurring within the transportation industry. In some instances, passengers or their canine companions died during the flight (Matousek, 2018). In other examples, passengers experienced confrontations with flight crew regarding their professional medical credentials (Hauser, 2018) or even if a stroller could be brought onboard (Rosenberg, 2017). Each issue presents a unique crisis but requires PR practitioners to craft an appropriate response to the concern.

PR practitioners have a variety of choices when responding to crises; in today’s digital world, crisis usually breaks on social media first and it is often necessary to respond quickly on social media before making official organizational announcements. While a timely response is critical in crisis communication, message quality is also important since it can influence the attitudes and behaviors of the public. This is especially true for social media messages, which can be easily misinterpreted and then widely shared (Jong & Dückers, 2016). The service sector is particularly more vulnerable to potential crisis issues because of the nature of the industry (Smith, 2005)—which includes highly active stakeholders, intangible service quality, and increased consumer expectations.

Unfortunately, little work has been completed that examines how crisis message quality can influence post-crisis outcomes (e.g., reputation and consumer intentions) within the context of social media. Therefore, the goal of this study is to investigate how the quality of social media messages during a crisis influences the public’s attitudes. This study focuses on the service industry, where consumers are often an integral part of the service system and help to shape the organization’s reputation (Dotchin & Oakland, 1994; Edvardsson, 1992). This arguably makes the field more prone to social media-based complaints from stakeholders (consumers) and the customers’ evaluations could severely affect the service industry. Recently, several airlines have encountered crises caused by the customers’ tweets and the strategic use of Twitter has become crucial in responding to crises (Schultz et al., 2014; Zhao et al., 2020). Moreover, publics often show an active presence on Twitter during crises to fulfill their information needs (Veil et al.,
Therefore, this study aims to examine the airline companies’ Twitter responses in crises. To do so, this study employed situational crisis communication theory (Coombs, 2007), with attention to message quality through person-centered messages (PCMs; Burleson, 1987). Person-centered messages have previously focused on interpersonal communication contexts, but have also been applied to understanding how publics respond to crisis messages. We begin by providing a review of situational crisis communication theory and person-centered messages before turning to our study.

Literature Review

Crisis Communication: Situational Crisis Communication Theory

Situational crisis communication theory (SCCT; Coombs, 2007) is a commonly used theoretical framework in crisis communication research. It provides a way to better understand the organization’s crisis response in light of reputation. SCCT posits that an organization’s reputation can be protected during a crisis if appropriate communication response strategies are selected (Coombs, 2007; Kiambi & Shafer, 2016). To do so, an organization should identify the crisis type and determine the initial crisis responsibility. According to SCCT, crisis types can be grouped into three clusters (victim, accidental, and preventable) based on levels of crisis responsibility (Coombs, 2007, 2011). In the victim cluster, the organization’s crisis responsibility is low because stakeholders view the organization as a victim. Crises in the accidental cluster occur when crisis-causing events are viewed as unintentional or uncontrollable. Stakeholders do not expect the organization to take high responsibility for events in these settings. The preventable cluster contains strong attributions of crisis responsibility, as the event is deemed to be something under the organization’s control and could have been avoided with proper measures (see Table 1).
The organization should then select suitable crisis response strategies that correspond to the appropriate crisis clusters or levels of responsibility attribution to alleviate negative public reactions (Coombs, 2007). Previous crisis history and relationship reputation should also be considered. As threats to an organization’s reputation increase, more accommodative crisis response strategies should result—these strategies demonstrate greater concern for victims (Coombs, 2007). Stakeholders are also more likely to perceive the organization is taking greater attribution and responsibility when such strategies are used (Coombs & Holladay, 2004, 2005). Taking responsibility is especially important for preventable crisis categories because this type often generates strong emotions (increased anger and decreased sympathy) about the organization (Coombs & Holladay, 2005). Negative emotions can cause stakeholders to engage in expressing their negative attitudinal and behavioral responses publicly, which can also affect an organization’s reputation (Coombs & Holladay, 2004).

With the growing importance of organizational social media use for crisis communication, several recent studies have tested SCCT in the social media context. For example, Coombs and Holladay (2012a) analyzed the effectiveness of an apology strategy for an online crisis and confirmed the effectiveness in managing the

### TABLE 1 Crisis Types

<table>
<thead>
<tr>
<th>Crisis Clusters</th>
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<tr>
<td>Victim cluster</td>
<td>Natural disaster</td>
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<td>Rumor</td>
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<td></td>
<td>Workplace violence</td>
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<td></td>
<td>Product tampering/Malevolence</td>
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<tr>
<td>Accidental cluster</td>
<td>Challenges</td>
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<tr>
<td></td>
<td>Technical-error accidents</td>
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<tr>
<td></td>
<td>Technical-error product harm</td>
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<tr>
<td>Preventable cluster</td>
<td>Human-error accidents</td>
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<td></td>
<td>Human-error product harm</td>
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<tr>
<td></td>
<td>Organizational misdeed with no injuries</td>
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<tr>
<td></td>
<td>Organizational misdeed management misconduct</td>
</tr>
<tr>
<td></td>
<td>Organizational misdeed with injuries</td>
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*Source: Coombs (2007).*
online crisis as prescribed in SCCT. Similarly, Brummette and Fus-sell Sisco (2015) applied SCCT for the case studies of three organiza-tions’ social media crises and found that the theory is useful to identify effective versus non-effective crisis response strategies to social media crises. More recently De Waele et al. (2020) exam-ined how social media publics reacted to situational and renewing organizational responses across six crises based on SCCT and discourse of renewal (DOR) theory. Their findings confirmed that showing sympathy in crisis responses is effective across all six crisis situations, which are consistent with the accumulating literature that supported SCCT. However, the results regarding the effects of the rebuild and diminish strategies were inconsistent with what SCCT proposed, which calls for more studies to test SCCT in the social media context. Therefore, this study proposes the following hypotheses based on SCCT to further test the theory with regard to social media.

**H1:** Crisis type (victim, preventable) will have an effect on people’s perceptions/reactions toward an organization.

**H1a:** Anger/negative emotions toward the organization will be lower for the victim crisis than for the preventable crisis.

**H1b:** Perceived reputation of the organization will be more favorable for the victim crisis than for the preventable crisis.

**H1c:** Consumer intentions regarding the organization will be more favorable for the victim crisis than for the preventable crisis.

**Person-Centered Messages**

While understanding levels of perceived responsibility is import-ant, SCCT also points to the importance of crisis response. One way in which this can be implemented is through crafting messages that are tailored to the crisis event and relevant publics. Unfortunately, few practical guidelines currently exist for crisis communication practitioners when responding to crisis events that unfold online (Rains et al., 2016). Practitioners may gain insight for these mes-sages by turning to the supportive communication literature (e.g., Jones & Bodie, 2014) that examines comforting communication. While SCCT suggests that attention be provided to crisis types and
responsibility, more competent crisis responses can be developed if consideration is given to the interpersonal dynamics of those interactions. To do so, emphasis should be placed on examining *person-centered messages* (Burleson, 1982; 1987). Integrating person-centered messages (PCMs) with SCCT allows crisis messages to respond to the multidimensional concerns that crisis entails.

Person-centered messages (PCMs) “reflect an awareness of and adaptation to the subjective, affective, and relational aspects of communicative contexts” (Burleson, 1987, p. 305). PCMs are part of constructivism (Delia et al., 1982), which is a theory of communicative competence (see, e.g., Bodie & Jones, 2016). Communicative competence refers to the “ability to generate and process messages in ways that enable people to accomplish their social goals appropriately and effectively” (Bodie & Jones, 2016, p. 2). Person-centered messages exist at nine distinct levels, with higher levels representing increased communicative competence (Burleson, 2008). These nine levels can be collapsed into three larger areas (Burleson, 1994). Low person-centered messages (LPCs) often condemn other’s feelings (LPC—level 1), challenge the legitimacy of other’s feelings or actions that follow these feelings (LPC—level 2), or ignore the other’s feelings (LPC—level 3). In comparison, medium person-centered messages (MPCs) attempt to reframe situations in a positive way (MPC—level 4), acknowledge feelings but do not assist the other in understanding those feelings or coping with them (MPC—level 5), or provide non-feeling-centered explanations that intend to reduce the other’s emotional distress (MPC—level 6). Finally, highly person-centered messages (HPCs) recognize the other person’s emotional reaction but do not provide elaboration for those feelings (HPC—level 7), provide an elaborated acknowledgment and explanation of those feelings (HPC—level 8), or help the other to gain perspective on one’s own feelings and attempts to link the feelings in relation to a broader context (HPC—level 9; High & Dillard, 2012). The use of person-centered messages has been linked to a variety of positive outcomes. Specifically, person-centered messages have been found to be especially helpful within the comforting communication area. For example, Jones (2004) indicated that when individuals shared a mildly
upsetting event with another person, they not only felt better but also rated the support provider as more supportive and caring when person-centered messages were implemented. Validation of one’s behavioral intention is also an important element within person-centered support messages. As B. Feng and colleagues (2016) note, when seeking support for a behavioral intention, such as changing one’s job, support seekers might solely be looking for validation from a support provider. Those support providers that use more person-centered messages are more likely to be viewed as effective (Eichhorn, 2008; B. Feng et al., 2016). The implications of using more highly person-centered messages become further exacerbated when one examines the use of support messages in online settings. For example, Rains et al. (2016) completed a comprehensive analysis of the extant literature on the relationship between computer-mediated communication (CMC) and social support. Their summary indicates that social support is frequently accessed and provided in online settings and for various reasons (i.e., perceived stigma, accessibility, and control). Interestingly, the literature notes that individuals using CMC to gain support have stronger motivations to receive it in comparison to those who seek support face-to-face. Furthermore, individuals who seek support through CMC also report larger changes in worry and uncertainty discrepancy, when compared to those in face-to-face settings (Rains et al., 2016). Several studies (Abendschein, 2020; Pan et al., 2020; Wright et al., 2012) demonstrate the ability of CMC to connect individuals for health-related information, but CMC can be used for support purposes in other contexts, as well.

With this in mind, it is especially important to consider the role that person-centered messages can play in CMC provided support messages.

**Social Media, Crisis Communication, and PCMs**

The rise of social media has brought along with it an audience-centric communication approach, due to the instantaneous and interactive nature of emerging platforms. Messages travel faster and farther with enhanced connectivity and access (Diddi & Lundy, 2017; Killian & McManus, 2015). Key publics are able
to receive, evaluate, and engage with messages at the touch of a button, making it more important than ever for practitioners to identify key publics, gauge public opinions, and adopt appropriate message strategies (Jiang et al., 2016). Moreover, social media users can directly respond to organizations, making two-way dialogue a staple in strategic communication (Grunig, 2009).

Social media is also the hotbed of sharing ideas, which makes word-of-mouth (WOM) a key topic to consider for crisis communication. Social media users can create huge waves of outrage within just a few hours, which Pfeffer and colleagues (2014) call “online firestorms” (p. 117). In fact, Pace and colleagues (2017) found that social media audiences react differently to a brand crisis when compared to their mass media counterparts. Those with higher engagement on social media not only had more negative attitudes toward the brand, but also had intensified intentions for sharing those negative views via WOM.

This calls for the importance of PCMs in crisis communication for several reasons. First, effective crisis management requires practitioners to pay attention to the attitudes and demands of affected publics. Consequently, creating messages tailored to stakeholders’ concerns is a primary goal. In message creation, PCMs ought to be emphasized, especially in cases where support or consolation is expected or required (Jones, 2004). Relevant studies have confirmed the positive effect of this, especially regarding publics’ empathy toward organizations. Schoofs and colleagues (2019) found that in crisis situations, proper apology from the organization leads to empathy among stakeholders and increases reputation recovery (unlike denial). An experiment from J. Kim & Jin (2016) observed that publics’ perceived involvement in the issue results in varied levels of emotions (e.g., anger, empathy) toward the organization, highlighting the importance of appropriate response strategies. This works the other way around as well—another study found that when CEOs express emotions in crisis response, publics feel empathy toward the CEO, which results in positive attitudes toward the organization (De Waele et al., 2020).

Second, the present study examines crisis situations in the service industry. The service encounter, the moment when the company’s employees meet and interact with customers, has occurred
increasingly online. In the online context, customers expect two-way dialogue with the company (Grunig, 2009) and more customer-centric communication, which are often emphasized in PCM to enhance communicative competence (Burleson, 2008). Czepiel and colleagues (1985) discuss how customers perceive service encounters are critical factors in how service quality is evaluated. If the service provider fails to meet the customer’s service expectations, the customer can easily challenge the organization on social media, while others can view these challenges as well. This heightened visibility raises new strategic and tactical concerns for crisis managers (Coombs & Holladay, 2012b), which consequently shapes an organization’s reputation (Edvardsson, 1992). This, in turn, increases the potential for an organizational crisis because of the variable and changing nature of consumers’ perceptions (Smith, 2005).

Finally, PCMs—rooted in interpersonal communication—should be considered in social media communication due to its characteristics as personal media, where dialogue often resembles that of interpersonal interactions (Lee et al., 2016).

Although there is considerable research attention in the crisis management area, previous research has yet to address the person-centered message quality approach with regard to crisis communication on social media. By the same token, studies suggest that organizations still need guidelines when responding via social media (Eriksson, 2012; Veil et al., 2011).

**H2:** PCM levels (LPC, MPC, HPC) in social media crisis communication will have an effect on people’s perception/reactions regarding an organization.

**H2a:** Higher PCM levels in social media crisis communication will result in lower anger/negative emotions toward the organization.

**H2b:** Higher PCM levels in social media crisis communication will result in a more favorable perceived reputation of the organization.

**H2c:** Higher PCM levels in social media crisis communication will result in more favorable consumer intentions toward the organization.
**RQ:** Are there any interaction effects between the crisis type and PCM levels in social media crisis responses on people’s perception/reaction regarding an organization?

The authors posit that through an interdisciplinary approach that integrates applied communication (SCCT) and interpersonal communication (PCMs), this study provides guidance for how organizations can respond to crisis through social media. Furthermore, this study will provide a better understanding about the effects of PCM levels in different crisis situations on organizational reputation and key publics’ attitudinal and behavioral responses.

**Method**

**Design and Stimuli**

This study employed a 2 (crisis type: victim, preventable) × 3 (PCM level: low, medium, high) between-within mixed factorial experimental design (Gliner et al., 2009). The Participants (n = 133) were randomly assigned to one of two experimental groups (between-subjects, crisis type), and then each participant in each group was exposed to three stimulus messages (within-subjects, PCM level) in random order. The within-subjects component of this experimental design was deemed appropriate to control for individual differences in perceiving the messages, therefore “greatly increasing the sensitivity of the measurements” (Lyon & Cameron, 2004, p. 222). That is, this design accommodates naturally occurring differences between individuals in the social media setting. Moreover, to address concerns about within-subjects designs being too transparent about the research hypothesis, Lambdin and Shaffer (2009) found that participants were unable to identify the hypotheses and inaccuracies in their predictions of the transparency of a within-subjects design. This design has also proven to be effective in measuring crisis communication messages from organizations (Hong & Len-Riós, 2015; Jin, 2009).

For the experiment, we manipulated crisis type by selecting one crisis from two clusters (victim and preventable) (Coombs, 2007; Coombs & Holladay, 2002, 2009). The two crisis clusters were selected to represent each end of the crisis responsibility
spectrum—in the victim type, the public tends to attribute minimal crisis responsibility to the organization experiencing the crisis, and the preventable type generates strongest attributions of crisis responsibility toward the organization (Coombs, 2007). This was adequate for differing the crisis example scenarios sufficiently for the purpose of this study. In a study comparing base crisis response with reputation management crisis response strategies, Kim and Sung (2014) also employed the two crisis clusters and found significant differences on how participants evaluated the clusters.

Among crises identified in each type, we then selected crisis examples based on realistic and commonly occurring airline issues. From the victim cluster, we selected natural disaster. From the preventable cluster, we chose organizational misdeed with no injuries. A fictitious airline was used to avoid potential confounding effects from pre-existing knowledge.

Furthermore, three tweets were generated for each crisis type to reflect three PCM levels (LPCs, MPCs, and HPCs). Each message was created specifically for this study, with the purpose of displaying varying levels of person-centeredness within each scenario. The level of person-centeredness in each tweet message was based on Burleson’s (1982) 9-category typology in conjunction with PCM strategies suggested by Sellnow et al. (2015). Key elements were mention of others (acknowledging the recipient, in this case, the customer), sympathy (displaying sympathy for the problem—e.g., “we understand”), responsibility (taking responsibility), apology and support/solutions (offering support and/or solutions). In our study, LPC (low person-centered) messages simply described the facts of the issue with a representative customer service phone number. MPC (medium person-centered) messages offered limited support or sympathy (but not both) and provided an additional method for communication (e.g., encouraging the individual to send a direct message). HPC (high person-centered) messages displayed all the four elements and contained a personal and detailed message that addressed that specific customer and his/her problems. These tweet messages were pre-tested by two interpersonal communication scholars, who were presented with Burleson’s (1982) 9-category typology for person-centered
messages and the sample airline messages for review. These experts were asked to provide feedback about the included sample tweets with specific attention to message fit regarding the intended PCM categories (LPC, MPC, HPC). Following expert feedback and further discussion, we refined the messages until they confirmed the tweets corresponded to different levels of person-centeredness. In this study, we focused strictly on Twitter given its conversational nature and instantaneous response characteristics of users and corporations. We therefore deemed it best suited to explore crisis message effectiveness on social media. See Figure 1 for an example of the tweet messages for the PCM levels.

Participants and Procedure

Participants \((n = 133)\) were recruited from undergraduate communication courses at two U.S. universities with the option of receiving extra credit. More females (65%) than males (35%) participated in the study. The majority (83.5%) of participants were in the 18–24 age group, followed by 25–30 (12%), 31–40 (2.3%), and 41–50 (2.3%). In terms of airline usage frequency, about half (48.9%) of participants reported that they used air transportation one to four times in the last 2 years from when the data was collected. Seventy-one percent of participants had Twitter accounts.

**FIGURE 1** Tweet Message Examples for Each Crisis Type Cluster (Top: Preventable, Bottom: Victim) and PCM Level (Left: HPC, Middle: MPC, Right: LPC)
Among those, 58.1% said they always or frequently use their Twitter accounts while about 22% of users visited the platforms sometimes or occasionally.

The survey link directed each participant to one of the two crisis types. At the beginning, participants read the scenario for their assigned crisis type, followed by questions regarding the airline’s responsibility, amount of control, and responsibility. Afterward, the participant was shown three tweets, in random order, that represented each PCM level. Each tweet was followed by questions regarding anger/negative emotions, corporate reputation, and behavioral intentions. Data was collected between December 2017 and April 2018.

**Measures**

*Consumer intentions* were measured by adopting Coombs and Holladay’s (2008) negative WOM intention item: “I would encourage friends or relatives to NOT travel with this airline,” assessed on a 7-point scale ranging from “strongly disagree” to “strongly agree.”

*Anger/Negative Emotions* were assessed by adopting Jorgensen’s (1996) measure of anger toward the company. This study used a 7-point scale (“not at all annoyed” to “very annoyed”). Using a single-item measure was deemed appropriate, given Bergkvist and Rossiter’s (2007) findings that single-item measures for concrete constructs (e.g., consumer reactions, attitudes) in marketing/brand research demonstrated equally high predictive validity as multiple-item measures.

*Corporate reputation* was assessed using 11 items, adapted from previous studies regarding organizational reputation (Coombs & Holladay, 2002; Ponzi et al., 2011) and person-centeredness (Sellnow et al., 2015). All items were measured on a 7-point Likert scale. Factor analyses were conducted to evaluate the dimensionality of the scale while the scale reliability was measured using Cronbach’s coefficient alpha. Based on the factor loadings and alpha scores, four items were removed which resulted in a seven-item corporate reputation scale. The seven items (see Table 2) demonstrate high internal consistency for measuring airlines’ reputation.
at low, medium, and high PCM levels, respectively ($\alpha = 0.93, 0.92, \text{ and } 0.94$).

**Manipulation Checks**

Crisis type was manipulated by providing participants with one of two hypothetical scenarios for potential crisis situations. After reviewing the scenario, participants were asked to determine the organization (airline)'s responsibility for that specific crisis. The following statement was presented: “The blame for the crisis lies in the circumstances, not the organization.” Then they received three PCM levels of responses (tweets) from the airline and were asked to evaluate each response using the following statement: “The airline cares about its customers.” Participants rated their agreement for these statements on a 7-point Likert scale from 1 (strongly disagree) to 7 (strongly agree). The manipulation check results suggest that the stimuli were effective. The participants assigned to the preventable crisis type assessed the airline’s responsibility for the crisis is significantly higher ($M = 4.8, SD = 1.68$) than victim type ($M = 2.9, SD = 2.1$), $t(126) = -5.78, p < .001$. In addition, participants reported that the airline cared more about customers when the airline responded with highly person-centered messages ($M = 5.36$ for victim; $M = 5.0$ for preventable) in comparison to either

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<th>TABLE 2 Corporate Reputation Measurement Items</th>
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<tbody>
<tr>
<td>The organization is concerned with the well-being of its publics</td>
</tr>
<tr>
<td>Under most circumstances, I would be likely to believe what the organization says</td>
</tr>
<tr>
<td>The airline is a company I have a good feeling about</td>
</tr>
<tr>
<td>The airline is a company that I trust</td>
</tr>
<tr>
<td>The airline is a company that I admire and respect</td>
</tr>
<tr>
<td>The airline has a good overall reputation</td>
</tr>
<tr>
<td>This airline cares about its customers</td>
</tr>
</tbody>
</table>
the MPC \((M = 4.61\) for victim; \(M = 4.67\) for Preventable) or LPC messages \((M = 3.51\) for victim; \(M = 3.39\) for preventable), \(F(1.94, 253.46) = 64.01, p < .001\).

Results

Influence of Crisis Type and PCM Levels of Crisis Responses on Emotion, Corporate Reputation, and WOM Intentions

To assess the main effects of crisis type, PCM levels of crisis responses, and any possible interactions on the participants’ negative emotions, perceived corporate reputation, and negative WOM intention, a series of mixed between-within subjects ANOVAs were conducted.

Negative Emotions

We first analyzed the influence of crisis type and PCM levels of crisis responses on negative emotions toward the organization. Findings suggest no significant differences exist for participants’ negative emotions toward the organization between the victim and preventable crisis types \((F(1, 131) = .13, p = .72)\). Mean scores indicate that negative feelings toward the organization are similar for both crisis types \((M = 3.64\) for victim; \(M = 3.57\) for preventable). Thus, \(H1a\) was not supported. However, there was a significant main effect of crisis responses’ PCM levels on negative emotions toward the organization \((F(1.93, 252.16) = 67.44, p = .00)\). A large effect size (.34) was located using eta-squared \((\eta^2)\) (Cohen, 1988). Mean scores suggest that people’s negative emotions decreased as the person-centeredness of crisis responses increased (See Table 3; Figure 2). Therefore, \(H2a\) was supported. There was no significant interaction between the crisis type and the PCM levels of crisis responses in terms of people’s negative emotions toward the organization \((F(1.93, 252.16) = 1.79, p = .17)\).
Corporate Reputation

The effects of crisis type and PCM on participants’ perceived organizational reputation were also tested. A non-significant main effect of crisis type on corporate reputation ($F(1, 131) = 1.52, p = .22$) was found. This suggests that participants evaluated airlines’ corporate reputation similarly for both victim and preventable situations ($M = 4.39$ for victim; $M = 4.21$ for preventable). Consequently, $H1b$ was not supported. However, there was a significant main effect of PCM levels on corporate reputation ($F(2, 262) = 68.98, p = .00$). The eta-squared ($\eta$) was .35, a large effect (Cohen, 1988). As presented in Table 3 and Figure 3, more favorable perceived organizational reputation scores were reported with higher PCM levels. Therefore, $H2b$ was supported. There was no significant interaction between the crisis type and the PCM levels of crisis responses in terms of perceived corporate reputation ($F(2, 262) = .33, p = .72$).
### TABLE 3  Mean Levels of Negative Emotions, Corporate Reputation, and Negative WOM Intention by PCM Levels of Crisis Messages across Two Crisis Types

<table>
<thead>
<tr>
<th>People’s Perceptions/Reactions</th>
<th>Crisis Types</th>
<th>PCM Levels of Crisis Messages</th>
<th>LPC</th>
<th>MPC</th>
<th>HPC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>N</td>
<td>M(SD)</td>
<td>M(SD)</td>
<td>M(SD)</td>
</tr>
<tr>
<td>Anger/Negative Emotions</td>
<td>Victim</td>
<td>67</td>
<td>5.30(1.94)</td>
<td>3.15(1.95)</td>
<td>2.48(1.91)</td>
</tr>
<tr>
<td></td>
<td>Preventable</td>
<td>66</td>
<td>4.76(2.18)</td>
<td>3.21(1.76)</td>
<td>2.73(1.63)</td>
</tr>
<tr>
<td>Corporate Reputation</td>
<td>Victim</td>
<td>67</td>
<td>3.59(1.30)</td>
<td>4.46(1.08)</td>
<td>5.10(1.15)</td>
</tr>
<tr>
<td></td>
<td>Preventable</td>
<td>66</td>
<td>3.44(1.28)</td>
<td>4.38(1.08)</td>
<td>4.82(1.04)</td>
</tr>
<tr>
<td>Negative WOM Intention</td>
<td>Victim</td>
<td>67</td>
<td>3.78(1.78)</td>
<td>2.79(1.70)</td>
<td>2.30(1.37)</td>
</tr>
<tr>
<td></td>
<td>Preventable</td>
<td>66</td>
<td>4.17(1.79)</td>
<td>3.56(1.73)</td>
<td>3.05(1.72)</td>
</tr>
</tbody>
</table>

### FIGURE 3  Corporate Reputation for Three Levels of Person-Centered Messages in the Victim and Preventable Crisis Types
Negative WOM Intention

We examined the influence of crisis type and PCM levels on negative WOM intentions. Our findings suggest that there was a significant main effect of crisis type on negative WOM intention ($F(1, 131) = 8.66, p = .004$). The effect size was medium ($\eta^2 = .06$; Cohen, 1988). Mean scores show that negative WOM intention was higher for the preventable crisis type ($M = 3.59$) than the victim ($M = 2.96$) types. This suggests the participants were more likely to intend to share negative comments about the organization with others with increases in an organization’s responsibility. Therefore, $H_{1c}$ was supported.

A significant main effect of the PCM levels on the negative WOM intention was also found ($F(2, 262) = 29.25, p = .00$). The eta-squared ($\eta^2$) was .18, a large effect (Cohen, 1988). The mean scores indicate that people are less likely to intend to say negative things about the organization as the person-centeredness of crisis responses on social media is increased (See Table 3). Thus, $H_{2c}$ was also supported. No significant interaction was found ($F(2, 262) = .77, p = .46$). Figure 4 plots negative WOM intention for three levels of person-centeredness in the victim and preventable crisis types.

**FIGURE 4** Negative WOM Intention for Three Levels of Person-Centered Messages in the Victim and Preventable Crisis Types
Discussion

Findings from this exploratory study shed light on crisis communication from an interdisciplinary perspective, especially regarding considerations for practice when responding to crises on social media. PCM levels in crisis response were a significant factor for participants’ negative emotions, organizational reputation, and negative WOM intentions. These findings emphasize the importance of employing person-centered strategies in crisis communication on social media.

Social media offer a group of unprecedented, comprehensive communication platforms that cross between mass and personal communication. Amid platform differences, most popular social media services allow for an individual’s ideas and opinions to be posted in the likes of personal communication messages, at the same time being shared with the public (Oh & Choi, 2017; B. L. Ott, 2017). This blurring of the private and the public has been a significant topic in scholarship as of late. Dey (2020) discusses how individual voices lead to heightened levels of activism across societies. While Kruse et al. (2018) found that the younger generation refrains from actively sharing political opinions on social media, their findings indicate that social media still fosters strong engagement with like-minded individuals. And on the topic of how information originating from private spheres spread to publics, Gil de Zúñiga & Bimber (2020) posits that social media serves as the provenance of information that shapes public discourse.

As this is the case, each user’s appreciation of the corporate message ends up shaping the overall reputation of the organization. Although individual voices of concern about an organization may start at the personal level, they spread through the individual’s networks and become source messages that could snowball into public perceptions. Therefore, and given how users treat social media messages with personal standards, organizations should look to formulate messages attending to the individual person.

In a meta-analysis of corporate reputation, Gatzert (2015) found that damaging events impact corporate reputation, and vice versa, which lead to negative stakeholder behavior and weakened financial performance. That is, merely focusing on normalizing
business operations is not sufficient to overcome a crisis to the ultimate benefit of the organization.

In crisis situations, showing sympathy and remorse for the situation fosters a positive persona about the corporation. The corporate persona is important because it is the first step in public opinion formation about an organization (Charlebois & Van Acker, 2016). At a crucial point postcrisis, the corporation's reputation isn’t damaged as much when it provides personal attention, because the corporation would be construed as responsible and caring. However, if the corporation's persona is defined as culpable and negligent when its messages are not centered at the stakeholders, significant impairment in crisis recovery could occur. Interpersonal communication research suggests similar parallels when more personalized messages are shared—support recipients receiving PCM messages were likely to rate providers more favorably (L. Feng et al., 2015).

These findings are crucial for understanding how consumers’ expectations for crisis communication are shifting to a new dimension with social media. Audiences on social media should be treated as any stakeholder group would. Their needs and demands should be identified and resolved, while tailoring messages to show that the organization cares for them. In so doing, PCM tactics from pertinent scholarship—namely, offering support rather than explanation, providing facilitated access to solutions, and putting the affected individual’s feelings first—would be appropriate. As Fediuk et al. (2010) noted, crisis response tactics should be rooted in the goal and strategy, in that it is used to influence stakeholders’ perceptions in some way. Currently, crisis communication research tends to focus on minimizing damage and protecting the organization; for crisis management on social media, we suggest that organizations should establish strategies to maintain organizational reputation after a crisis (Fediuk et al., 2010) and operationalize them through communicative tactics that integrate PCMs.

Furthermore, lower PCM levels led to stronger intentions to share negative content about the organization. This can be attributed to the current social media landscape and rising empowerment and engagement among users. Social media users display
higher levels of attachment to various issues (Gearhart & Zhang, 2015; B. L. Ott, 2017), making them stronger than meets-the-eye stakeholders for any crisis. When they see that an organization did not “own up” to a crisis, they will likely see this as unjust actions of businesses and display stronger levels of engagement by generating and sharing negative messages.

While H1a (negative feelings toward the organization) and H1b (corporate reputation) were not supported for differing levels of crisis, H1c (behavioral intentions) was supported. This might illustrate that online users are quick to jump to negative actions even if their perceptions toward the organization’s responsibility or corporate reputation were not significantly damaged. Alternatively, this could also mean perceived reputation of the organization can still be damaged in any crisis case due to consumers’ active posting and feedback (Kiambi & Shafer, 2016).

Moreover, social media have amplified the information people receive, both in terms of sheer amount and kind. That is, users on social media are able to witness more frequently what is happening with organizations, including a variety of different activities or events. Consequently, organizations are increasingly being placed under the magnifying glass—because more such information is accessible, organizations are more prone to displaying reprehensible behavior.

For this reason, we believe users may gradually be distinguishing less what may have been distinct crisis types but are simply becoming dissatisfied with an organization. In this study, the victim situation included flight cancellations due to inclement weather; while there was not much the organization could do about it, social media users still emphasized their inconvenience over level of responsibility, thereby showing similar emotional reactions (negative) and attitudinal response (regarding the organization’s reputation).

We note that participants displayed an increased willingness to engage in negative WOM in preventable crisis types. From an interpersonal communication lens, this may be explained by turning to work on action tendencies that provide insight on the connection between emotional processing and consumer behavior. According to Lazarus (1991), when individuals are angry, they
are likely to attack those who are considered blameworthy for the offense. Even if an individual experiences negative emotions and low organization reputation in both cases, they could be triggered to share negative WOM when the responsibility (and, therefore, blame) of the organization is clearly identified. In preventable crises, stakeholders would particularly be able to identify the organization to blame, and the complaints would likely increase since the organization is an easy target (Kang et al., 2019).

Indeed, studies show that corporations’ crisis responses impact consumer emotions, leading to attitudinal and/or behavioral reactions. Xiao and colleagues (2018) studied how stakeholders reacted to emotion placement in crisis response messages, finding that incorporating different emotions for different crisis types worked better for decreasing the individual’s negative word-of-mouth intentions. A study on stakeholders’ response to corporate social irresponsibility (CSI) found that individuals display emotional reactions (sympathy) to victims of CSI and that this leads to intentions for punitive actions toward the organization (Antonetti, 2016). Results from Ayoko and colleagues (2017) suggest that an organization’s crisis response messages—especially messages communicated by managers—have a profound effect on internal stakeholders’ emotions.

This highlights the need of organizations to proactively prepare for negative WOM. With the enhanced means to engage with messages and availability for one-to-many dialogue in social media communication (Gearhart & Zhang, 2015; Grunig, 2009), this possibly means that behavioral intentions on social media emerge more quickly than ever (L. Feng et al., 2015). As Benoit (2018) also notes with the United Airlines case, this points to the growing possibility of social media backlash occurring almost simultaneously with the crisis’ occurrence, making speedy crisis response a priority. As such, Brummette & Fussell Sisco (2015) found that Twitter users tend to share emotions in their posts, thus recommending that organizations could monitor the platform to gauge public sentiments to craft better messages.

Finally, we take note that no significant interaction effects were found between crisis type and PCM levels. We argue that this is because crisis message quality is important in any crisis. In other
words, a mere difference in crisis type does not warrant that participants will have particularly more (or less) favorable attitudes or behavioral intentions based on PCM level. Rather, our findings seem to indicate that participants overall gave more positive responses as PCM levels went up, regardless of crisis type.

**Conclusion and Practical Implications**

We acknowledge that this study is not without limitations, and also provide direction for future research on the topic. This study strictly focused on Twitter to better understand how users respond to messages in the social media setting; future studies comparing crisis responses on social media with other forms of online media or traditional media would help further understand the effectiveness of PCMs in various means of crisis response.

Additionally, this study collected data from college students, who are usually considered to be more homogenous than representative samples. While some researchers such as Lucas (2003) and Kardes (1996) have argued that using college students is appropriate for studies focusing on understanding basic psychological processes, several studies (i.e., Peterson & Merunka, 2014) have noted the limitations of using convenience samples of college students, especially in generalizing the results to non-student populations. Consequently, future studies with different samples are needed to determine whether the results vary with other populations.

Our goal was to assess if crisis types and PCMs affect how participants perceive crisis response message quality and their corresponding attitudes toward the organization, which includes post-crisis organizational reputation, emotions, perceived responsibility of the organization, and behavioral intentions. We believe that this study can contribute to professional practice with its interdisciplinary approach and findings. That is, we posit that research from interpersonal communication (PCMs) can be applied to practice in a key area of PR, crisis communication. This paper’s practical implications may be summarized in three aspects: (1) evaluating the crisis; (2) communicating the crisis; and (3) crisis management on social media.
First, evaluating the crisis refers not merely to measuring success or recovery, but assessing the crisis upon its occurrence. As soon as a crisis-like situation is monitored on social media, practitioners ought to first identify the type of crisis, assess the level of responsibility on the part of the organization, and, most importantly, ensure that the organization’s assessment of responsibility recognizes social media users. As we found in this study, users are quick to make judgments based on crisis type and their motivations to share negative feedback is affected as a result. Therefore, the severity of the crisis should be considered in executing a crisis management strategy.

There is more, however: PR practitioners should also carefully examine key stakeholder groups and pinpoint their psychographics, needs, and demands. Noteworthy here is that such activities should go beyond conventional definitions of “the affected.” Publics not only look at the organization’s responsibility level, but how well they exercise person-centeredness in dealing with stakeholders. Therefore, conducting ample research and vetting the crisis level plus all possibly affected publics (i.e., expanding the search and research of online stakeholders) are key. This points to the ever-more importance of properly handling the proactive and strategic phases of conflict management on social media. We recommend that organizations would benefit from putting a detailed proactive crisis plan in place, perhaps designating more members of the workforce to monitor and assess crises.

Similarly, pertinent work on social media and organizational communication emphasizes the importance of listening. MacNamara (2016) notes that while the importance of listening is noted enthusiastically throughout the interpersonal literature, it is “surprisingly and problematically overlooked in . . . organizational–public communication” (p. 133). Online activity has been dominated by “speaking up” (Crawford, 2009) rather than listening. Therefore, organizations should employ more canons of listening (see MacNamara, 2016), several of which reflect qualities of highly person-centered messages (e.g., giving consideration, responding, engaging in interpretation with the goal of understanding). Providing increasingly person-centered messages is one
way in which organizations can note that they are listening to publics’ concerns during times of crisis.

Second, in communicating the crisis on social media, PR professionals should rethink communicative competence in their response. Our key finding is that when engaged in crisis communication, PCM levels are a main factor in how participants respond in both their attitudes and behavioral intentions. Thus, crisis communication should be operated with a person-centered mindset, and each response should consider how the receiver would personally feel. PCM strategies such as assuming responsibility, putting the emotions of the receiver first, displaying apologetic gestures, offering support, and providing solutions should be adopted. These approaches will also be useful for image repair tactics (Gribas et al., 2018). Although we acknowledge that PCM and social support scholarship maintains all levels of PCM to be important (i.e., even LPC could be treated as a support attempt), we argue that enhancing message quality is about improving the level and skill of utilizing PCMs.

However, as Rains and colleagues (2016) note there is more development needed to explore how person-centered messages are used in computer-mediated communication (CMC) settings. As such, additional research is needed that examines how and when organizations choose to employ person-centered messages through mediated channels. While our study focused specifically on exploring three examples of crises within a hypothetical airline in social media communication, we suggest future scholarship should also explore if and how differences in person-centered messages can occur in online versus face-to-face crisis situations. Though increasing number of crises are occurring online (Coombs & Holladay, 2012b), scholars would benefit from understanding the implications of message quality in crisis settings and the differences that exist in relation to the channel(s) in which they are provided.

A caveat for employing PCMs would be that an organization should not misunderstand person-centered messages as mere friendliness, therefore lacking professionalism. Enhancing message quality through PCMs does not necessarily mean that formal
language and corporate-level communication should be discarded. Official statements and business communication materials should consistently adhere to showing authority and being factual. We also believe a meaningful challenge for practitioners would be to find the right balance. All in all, we still maintain that revamping the writing, editing, and reviewing process of messages with PCMs in mind will be helpful for practitioners in handling crises on social media.

Finally, we emphasize how all of this has been elevated to new dimensions in the rapidly developing digital landscape. PCMs should be considered with even more weight in crisis communication on social media because of the personal communication characteristics of social media and its users. In relation to the second aspect above, we might also add that social media serve as a useful channel for person-centered communication efforts since consumers feel at ease on social media—arguably, practitioners would be reaching out to stakeholders on their own turf, thereby enhancing the effectiveness of messages. Furthermore, we believe that existing thoughts on crisis types may need to be revisited, since accidental type crises were perceived just as crucial as preventable crises in the social media setting. Therefore, crisis threats (called “paracrisis” by Coombs & Holladay, 2012b, p. 408) online requires practitioners to take a more cautionary approach. Also, every organization should be prepared for social media backlash, big and small, and be ready to engage in two-way communication with stakeholders. This calls for the necessity of designated social media teams who are capable of proper research and incorporating quality in PCM in the writing, disseminating, and evaluating social media communication.

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How College Students Assess the Threat of Infectious Diseases: Implications for University Leaders and Health Communicators

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ABSTRACT

Higher education institutions and their students face a wide range of infectious disease threats (IDTs). However, there is a lack of theory-driven research on how to provide communication for multiple IDTs to motivate protective action taking. To close this gap, this study focuses on college students and two IDT types: respiratory and sexually transmitted infections. We tested an IDT appraisal model with data from an online survey conducted at two U.S. universities with 842 students. Findings indicate that IDT type led to different patterns of threat appraisal and protective action taking intentions. More specifically, participants perceived sexually transmitted threats as significantly more predictable and more controllable than respiratory threats. Participants also had higher intention to take protective action in response to respiratory threats than sexually-transmitted threats. We also found that external-attribution-dependent (EAD) emotions (i.e., anger, sadness, surprise, and confusion)
and an internal-attribution-dependent (IAD) emotion (i.e., hope) were sequential mediators in the relationship between IDT appraisal and protective action taking intentions for both infectious disease types. Implications for IDT communication research and practice are discussed.

**KEYWORDS:** infectious disease, threat appraisal, crisis emotions, higher education

Higher education institutions and their students have increasingly faced infectious disease threats (IDTs). These threats have included the 2009 H1N1 outbreak, Middle East respiratory syndrome (MERS-CoV) outbreaks, annual exposure to seasonal influenza (Y-I. Lee et al., 2018), and frequent exposure to sexually transmitted infections including human papillomavirus or HPV (Alsulaiman & Rentner, 2018; Yang & Pittman, 2017; L. Zhang et al., 2015). Notably, thousands of U.S. higher education institutions are currently navigating how to respond to the coronavirus pandemic, and early evidence suggests that these institutions are struggling in their risk communication about COVID-19 (Burke, 2020). Compared to research on active shooter incidents and natural disasters, students’ physical and emotional health during IDTs has not been extensively explored (Moerschell & Novak, 2020). This study builds on recent trends to develop and test a new theoretical model tailored for infectious disease crisis communication (Jin et al., 2020; Y-I. Lee & Jin, 2019; B. F. Liu et al., 2020).

In the field of health communication, there has been a substantial body of literature on sexually transmitted infections (STIs), often testing messages to promote healthy behaviors among college students (e.g., Boudewyns & Paquin, 2011; Lin & Lagoe, 2013; Yang, 2015). Indeed, every year almost half of the 20 million newly diagnosed STIs in the U.S. are among young adults aged 15 to 24 (CDC, 2016). Likewise, every year college campuses face the threat of seasonal flu outbreaks (Y-I. Lee et al., 2018). Accordingly, college student samples are ideal for research on IDTs. However, despite the prevalence of IDTs on campus, there is little research examining how college students can positively navigate these threats. Instead, the preponderance of research examines a single IDT (e.g., Best et al., 2018; Rubin et al., 2009; Taha et al., 2013; Yang & Pittman, 2017).
This study builds on prior research developing a new theoretical model tailored for infectious disease crisis communication (Jin et al., 2020; Y-I. Lee & Jin, 2019; B. F. Liu et al., 2020), factoring in the impact of negative and positive crisis emotions most relevant to IDTs (Jin et al., 2020; Jin et al., 2014; B. F. Liu et al, 2016; van der Meer & Jin, 2020). Our approach contributes to health risk and crisis communication research on at least two fronts. First, we examine how college students respond to different IDTs, controlling for individual differences. Second, we evaluate affect, integrating discrete emotions, and affective dimensionality into the health risk communication literature.

We focus on college students and two types of IDTs: (1) respiratory infectious diseases, given the enormous impact of COVID-19 on campuses around the world, and (2) the long-standing threat of STIs among this population. We tested the proposed model with data from an online survey conducted at two U.S. universities with 842 students conducted in 2017. Findings reveal that IDT type (i.e., respiratory diseases versus STIs) led to different patterns of IDT appraisal and protective action taking intentions. Moreover, among identified IDT attribution-dependent emotions, external-attribution-dependent (EAD) emotions (i.e., anger, sadness, surprise, and confusion) and internal-attribution-dependent (IAD) emotion (i.e., hope) were found to be sequential mediators in the relationship between IDT appraisal and protective action taking intentions for both IDTs.

Literature Review

Infectious Disease Threat (IDT) Appraisal

Grounded in Jin’s (2010) cognitive appraisal model of crises and risks and its three primary appraisal dimensions (i.e., perceived predictability, controllability, and responsibility), scholars have recently developed a new IDT appraisal model (Jin et al., 2020), containing three key dimensions of how publics appraise IDTs: perceived predictability, controllability, and responsibility. The initial empirical examination was based on a representative sample of U.S. adults. This prior study revealed that the IDT appraisal model helped explain and predict individuals’ cognitive, emotional, and
behavioral responses to sexually transmitted infections and threats from waterborne, foodborne, and vector borne diseases. The results supported the IDT appraisal model’s overarching proposition: Individuals’ assessments of predictability, controllability, and responsibility drive their affective responses, information seeking, and conative reactions to IDTs. This study builds on the initial IDT appraisal model research in multiple ways. First, this study investigates the role of discrete emotions beyond affective valence in the process of how individuals appraise IDTs and the impact of this appraisal process on behavioral outcomes.

Second, this study uncovers whether the IDT appraisal model can be applied to specific at-risk populations (e.g., college students) in the context of two threats: STIs and respiratory diseases. Therefore, this study applies the new IDT appraisal model (Jin et al., 2020) to examine how college students in the U.S. appraise some of the most challenging and common IDTs (i.e., respiratory and STIs). Findings reveal how students’ appraisals of IDT predictability, controllability, and responsibility predict students’ affective responses and intentions to take protective actions.

It is imperative for college students to take recommended actions to protect themselves against STIs (e.g., wear a condom, get vaccinated) and respiratory diseases (e.g., wash hands, maintain social distance, cover coughs/sneezes, get vaccinated). In this section, we review the growing body of literature linking IDT predictability, controllability, and responsibility to protective action taking in response to STIs and respiratory diseases.

**Perceived IDT Predictability**

Individuals’ risk perceptions vary by subjective judgment of different characteristics (e.g., whether a risk is dreadful or familiar) associated with risk issues (Ropeik, 2002; Slovic, 1987). In an IDT situation, perceived predictability is defined as the extent to which individuals perceive that they can predict what will happen (Jin, 2010; Jin et al., 2020).

A recent study found that individuals’ assessments of the predictability of an IDT situation drove their intentions to take protective actions (Jin et al., 2020). No prior research has examined the relationship between perceived IDT predictability and college
students’ intentions to take protective actions against respiratory diseases and STIs. However, research has consistently found that college students often display an optimistic bias in that they do not actively engage in preventative behaviors to mitigate their risk of contracting infectious diseases (Afifi & Weiner, 2006; Best et al., 2018). Given the dearth of prior research comparing college students’ responses to respiratory and sexually transmitted IDTs, this study asks:

**RQ1.1:** Do college students perceive IDT predictability differently across respiratory and sexually transmitted IDTs, and if so, how?

### Perceived IDT Controllability

Jin (2010) conceptualized control as individuals’ beliefs that human agency is present or available for a crisis or risk situation. In an IDT situation, perceived controllability is connected to a sense that treatments or prevention of an infectious disease are possible or available (Jin et al., 2020). For example, novel and severe infectious diseases may be seen by the public as low in controllability (Ropeik, 2002; Slovic, 1987) due to the lack of an available vaccine, evolving scientific knowledge, or disease containment uncertainty.

Risk perception has been linked to perceptions of the controllability of health and safety risks among college students (Inungu et al., 2009; Weinstein, 1984). Alarmingly, college students are unrealistically optimistic about their risk of contracting diseases that are perceived as preventable through personal action (i.e., controllable) (Weinstein, 1984). Research is mixed when it comes to whether risk perception of contracting a respiratory infectious disease predicts vaccination intentions among U.S. college students. Some research finds that students do not believe that an infectious disease threat is severe enough to merit vaccination (Cornally et al., 2013; Roberto et al., 2019). Other research finds that messages of self-efficacy that highlight benefits of vaccines can motivate college students to vaccinate (Agarwal, 2014; Yang, 2015).

In the context of STIs, one study found that college students were more likely to report taking protective actions (i.e., condom use) if they viewed STIs as having highly negative impacts on their health (Rintamaki & Yang, 2013). However, they only used...
condoms if they believed that condoms were effective at reducing their risk of contracting an STI (Rintamaki & Yang, 2013). Similarly, in the context of HPV, one study found that the shame of contracting HPV and perceptions of high controllability predicted intentions to vaccinate among college students if the vaccine was available immediately at no cost (Yang & Pittman, 2017). Given the mixed research record, this study further investigates how perceptions of IDT controllability influence college students’ decisions to take protective actions against respiratory diseases and STIs. Therefore, we ask:

**RQ1.2:** Do college students perceive IDT controllability differently across respiratory and sexually transmitted IDTs, and if so, how?

**Perceived IDT Responsibility**

As acknowledged in the development of the IDT appraisal model (Jin et al., 2020), there is a gap between how crisis and health scholars define and measure responsibility in different contexts (e.g., organizational crisis versus public health crisis). Crisis communication scholars have defined crisis responsibility as “the degree to which stakeholders blame the organization for the crisis event” (Coombs, 1998, p. 180), which can be observed by the degree of blame placed on an organization and can lead to negative organizational outcomes (e.g., Coombs & Holladay, 2005; W. Liu et al., 2018). Given that an IDT situation is in the domain of public health, it is critical to examine individuals’ perceived IDT responsibility perceptions through the lens of health communication.

According to the IDT appraisal model (Jin et al., 2020), IDT responsibility is based on the integration of public health and crisis communication literature and includes two facets of responsibility (Jin et al., 2020; Y. Zhang et al., 2015): the responsibility for the cause(s) of threats and the potential solutions. Regarding the organizational facet of IDT responsibility, although people are unlikely to hold a health authority responsible for actively spreading a virus (IDT cause), they are likely to hold authorities responsible for perceived lack of effective prevention and control of the disease (IDT solution) (Jin et al., 2020). We posit that this definition will apply
to the population of college students and the two specific IDT types we examine in this study.

In terms of the IDT responsibility facet, research connects personal responsibility with protective actions in the context of STIs (Best et al., 2018; Boudewyns & Paquin, 2011; Cheah, 2006; Vorpahl & Yang, 2018) and respiratory infectious diseases (Panda et al., 2015). One study found that patients aged 17 to 27 displayed difficulty connecting HPV and their cancer diagnosis. Consequently, they rarely made connections between preventative behaviors they could take in the future and actions that they could recommend to their friends and family members (Best et al., 2018). Other research has echoed these findings, noting a “tremendous lack of awareness by college students about the sexual realities that they face” (Afifi & Weiner, 2006, p. 49).

To improve awareness, one study found that college students believe that campus health centers have a responsibility for educating them about STIs (Cheah, 2006). Campaigns might be most effective when they persuade college students that getting tested for STIs would show respect for their sexual partners and prevent the spread of an STI to someone else (Boudewyns & Paquin, 2011). Conversely, U.S. college students may be receptive to messages that attribute the cause of HPV infection as external (i.e., others can pass HPV on to you) rather than internal (i.e., you can pass HPV on to others), and messages with external attributions led to a higher vaccine intentions (Vorpahl & Yang, 2018).

In regard to responsibility perceptions associated with respiratory infectious diseases, the global community has witnessed people blaming individuals living in the region where a new infectious disease was first reported (Schram, 2003; Washer, 2004) and being suspicious about transparency and credibility of the guidelines provided by their governments and other health institutions (Lau et al., 2003; Pickles & Goodwin, 2006). Given the highly uncertain and more easily spreading nature of respiratory infectious diseases, the public expects governments and health authorities to take responsibility for providing prompt and appropriate guidelines (Smith, 2006). Indeed, a lesson learned from past management of respiratory IDTs (e.g., SARS, MERS-CoV) was that responsibility,
authority, and accountability should be clearly communicated to effectively respond to IDTs (Smith, 2006). Also, public health professionals have emphasized that it is critical to create an atmosphere of mutual trust and solidarity when communicating respiratory IDT information for the public to follow health authorities’ guidelines with confidence (Kotalik, 2005; S. I. Lee, 2015).

Based on the literature reviewed above, it is important to understand individuals’ perceived responsibility for the cause and solution of an IDT in order to effectively intervene. Therefore, this study examines how attributed blame to at-risk individuals, health professionals, and health authorities might impact protective action decisions. Therefore, we ask:

**RQ1.3:** Do college students perceive IDT responsibility differently across respiratory and sexually transmitted IDTs, and if so, how?

### IDT Appraisal and Protective Action Taking

The recent development of the IDT appraisal model based on a general U.S. adult sample suggests that individuals’ perceived IDT predictability, controllability, and responsibility impact how they respond to an IDT situation across different IDT types (Jin et al., 2020). For example, Jin and colleagues (2020) found that more predictable but less controllable IDTs led to increased information seeking on specific media channels (e.g., government social media) as well as protective behaviors. Furthermore, IDTs that were less predictable and less controllable were associated with more information seeking and protective behavioral intentions.

When individuals have a good understanding about an IDT (high predictability) and feel that they have volitional control over the situation (high controllability), the overall perceived threat is likely to be low (de Zwart et al., 2009; Weinstein, 1984). Given the low perceived threat, individuals may become optimistic about their susceptibility to a given infectious disease and are less likely to engage in protective behaviors (e.g., de Zwart et al., 2009; Inungu et al., 2009). Studies have found that protective action taking is more likely to occur when the perceived threat is high and an individual has self-efficacy or the belief that one has volitional control over a situation (Floyd et al., 2000; Kim & Hawkins, 2020; Witte, 1992).
STIs are probably perceived as being more predictable and controllable, compared to respiratory infectious diseases, which are often newly emerging diseases with causes and treatment unknown. When exposed to respiratory IDTs, especially during the initial phase, individuals’ anxiety for unknown risks is likely to increase and, consequently, they may engage in protective action taking (Lau et al., 2003; Leung et al., 2005; Rubin et al., 2009). However, little is known about how responsibility perceptions are related to protective actions taken in response to different IDTs. The relationship between the way an IDT is perceived in multiple ways and protective action taking needs to be further examined across different IDTs.

Applying the IDT appraisal model to understand U.S. college students’ responses, we further focus on the protective actions that college students intend to take against respiratory and sexually transmitted IDTs, as protective action taking is among the most important responses to predict in order to save lives (Jin et al., 2020). We ask:

**RQ2**: Do college students’ intention to take protective actions differ across respiratory and sexually transmitted IDTs, and if so, how?

**The Role of Emotions in Responding to IDT**

Emotions play a critical role in crisis and risk communication. Studies have found that emotions impact how individuals process crisis information (Jin, 2010; Jin et al., 2010) and individuals’ protective action decision-making (B. F. Liu et al., 2020). Initial testing of the IDT appraisal model has found that individuals’ affective responses varied by different levels of IDT appraisal dimensions (Jin et al., 2020). These affective responses further predicted behavioral outcomes (Jin et al., 2020). Affective responses may also mediate the relationship between college students’ IDT appraisal and behavioral intentions in the context of respiratory and sexually transmitted IDTs.

The connection between IDT appraisal dimensions and affective responses was observed in Jin and colleagues’ (2020) study. Specifically, the more predictable or controllable an IDT was perceived to be, the less likely individuals were to feel negative about
the situation. Furthermore, total affective negativity increased toward an unpredictable IDT situation when a person or organization was viewed as being responsible for what happened. Jin and colleagues (2020) pointed out that a sense of losing control of an IDT situation could contribute to increased feelings of negative affect. To extend the affective front of the new IDT appraisal model, this study further explored how the three IDT dimensions of predictability, controllability, and responsibility might connect with discrete emotions (Jin et al., 2014).

Furthermore, a variety of studies have shown a connection between certain emotions and individuals’ protective actions taken against respiratory infectious diseases. Specifically, research has connected fear to protective action taking, such as reduced contact with friends, avoidance of social gatherings, and intentions to vaccinate among adults (Cowling et al., 2010; Guo et al., 2005; Leung et al., 2005). Another study with U.S. college students found that media consumption predicted protective behaviors, such as hand-washing and vaccination intentions in response to respiratory infectious diseases, mediated by fear and knowledge (L. Zhang et al., 2015). Research has also demonstrated a positive relationship between anxiety and protective action taking (Leung et al., 2005; Rubin et al., 2009). For example, a longitudinal study among Hong Kong residents found that anxiety of contracting SARS predicted reported adoption of personal protective measures, such as wearing a face mask (Leung et al., 2005). Other research also has found a link between hope and reaching personal health choices such as the selection of sexual partners (Barnett et al., 2015; Snyder et al., 1996).

However, not all research links emotions to effective protective action taking. For example, research has found that Canadian adults who engaged in emotion-focused coping versus problem-focused coping were less likely to report intentions to obtain the H1N1 vaccine (Taha et al., 2013). Likewise, in a survey of Hong Kong adults during the H1N1 outbreak, higher anxiety was associated with greater social distancing, but less use of hygienic measures (Cowling et al., 2010). In terms of STIs, a meta-analysis found that anxiety was strongly and positively correlated with uncertainty of STI risk; also, uncertainty was significantly associated with
avoidance behaviors, such as not taking appropriate protective actions (Kuang & Wilson, 2017). Therefore, more research is warranted to uncover how emotions affect decisions to take protective actions in response to respiratory diseases and STIs.

**IDT Emotions by the Locus of Attribution**

The level of responsibility attributed to an event (e.g., a health crisis) is associated with the types of emotions the individual feels about the event (Coombs & Holladay, 2005; Jin et al., 2010). Choi and Lin (2009) suggested that attribution-independent and attribution-dependent emotions may coexist during a crisis by examining emotional responses to Mattel’s product recall in 2007. Jin and colleagues (2014) further identified three types of crisis emotions based on the presence and direction of attribution: (1) attribution-independent (AI) emotions (i.e., anxiety, fear, apprehension, and sympathy); (2) external-attribution-dependent (EAD) emotions (i.e., disgust, contempt, anger, and sadness); and (3) internal-attribution-dependent (IAD) emotions (i.e., guilt, embarrassment, and shame). These crisis emotions (negative and positive) co-exist and exert varied levels of influence at a given point of time as well as evolve and change over time sequentially or concurrently (Jin et al., 2014). Later crisis emotion studies suggested additional discrete emotions (e.g., surprise, confusion, hope) to affective measures, especially examining emotional responses to disasters (e.g., Jin et al., 2016) and health communication (e.g., Nabi & Prestin, 2016; van der Meer & Jin, 2020). In light of the new IDT appraisal model (Jin et al., 2020), we further examine IDT emotions, which are selected from Jin et al.’s (2014) crisis emotion inventory. This inventory identified the positive and negative emotions that individuals are likely to feel according to whom they hold responsible for a crisis.

As Jin and colleagues (2020) uncovered, IDT appraisal dimensions and individuals’ affective responses are connected. When individuals strongly believed that someone or an organization is responsible for an IDT, they were more likely to experience stronger negative emotions (Jin et al., 2020). Additionally, an IDT with higher predictability or higher controllability lowered negative
feelings about the situation, while a sense of losing control of an IDT situation increased negative affect (Jin et al., 2020). These new insights in IDT appraisal research seem to point to the unique nature of IDT attribution, jointly affected by IDT responsibility as well as IDT predictability and controllability.

In this study, emphasizing the appraisal process and the unique nature of IDT attribution, we propose the following two attribution-dependent IDT emotions to be used in assessing college students’ affective responses to respiratory and sexually transmitted IDT situations. First, EAD emotion (i.e., anger, sadness, surprise, confusion) is a predominately negative affect resulting from attributing IDT responsibility externally. For example, one is angry with a responsible party other than oneself, one feels sad because of the uncertainty of the situation, and one is surprised or confused by the situation. Second, IAD emotion (i.e., hope) is a positive affect resulting from attributing IDT responsibility internally. For example, hope has been associated with stronger self-efficacy and stronger acceptance of HPV vaccine messages among college students (Nabi & Prestin, 2016). When it comes to infectious disease outbreak communication, a recent study found that U.S. adults are more likely to take recommended protective actions when they feel more optimistic about public health crisis situations (van der Meer & Jin, 2020). Therefore, after initial health message exposure, if one is hopeful and optimistic that a situation can be dealt with by taking one’s own responsibility, one may be more likely to take protective actions as recommended. In this way, hope as an IAD emotion can function as a mediator between health messages and intended behavioral outcomes, as in previous health studies.

**IDT Emotions as Sequential Mediators**

According to the Centers for Disease Control and Prevention (CDC, n.d.), infectious diseases are illnesses caused by germs that enter the human body and cause an infection. Additionally, the CDC (n.d.) has stated that some infectious diseases are contagious and spread from one individual to another; other infectious diseases are spread in the air, water, or food. People can feel threatened when they face any infectious disease threat, which can trigger negative attribution-based emotions (Jin et al., 2020). This
study tests emotions because emotions shift in response to health messages (Nabi, 2015). Individuals experience different emotional shifts as they appraise and reappraise messages (Nabi, 2015; Nabi & Myrick, 2019). Hope, in particular, has been identified as a positive emotion to explain how emotions flow in response to information about health risks, but negative emotional flow also occurs (Nabi, 2015). Based on attribution-based crisis emotions (Jin et al., 2014) and emotional flow (Nabi, 2015), this study examines whether and how people’s negative emotions (e.g., anger, sadness, contempt, and disgust) and positive emotions (e.g., hope) flow in an IDT context. A recent study reported both positive and negative affect among individuals varied as a function of their IDT appraisal (i.e., IDT predictability and controllability), which further predicted other response outcomes such as information seeking and following recommended protective actions (Jin et al., 2020). Based on this prior research, we posit that both EAD emotions (i.e., anger, sadness, surprise, confusion) and IAD emotion (i.e., hope) function as mediators for the relationship between college students’ IDT appraisals and their protective action taking intentions.

Additionally, the literature suggests a sequential relation between EAD and IAD emotions. According to Jin et al.’s (2014) argument, EAD emotions in general are generated due to the negative outcomes of a crisis event, which result in publics’ efforts to seek the cause of these negative outcomes (Choi & Lin, 2009; Jin et al., 2014; Weiner, 1986). IAD emotions are typically triggered according to “how individuals felt about themselves as publics associated with a given organization after learning about the crisis situation” (Jin et al., 2014, p. 512), which indicates the importance of personal identification with crisis responsibility. Given that an IDT situation is triggered by an external threat, which is likely to drive external attribution first (thus EAD emotion) and then trigger internal attribution (thus IAD emotion), we posit the following set of hypotheses, delineating an EAD-IAD sequential mediation model in the current study:

**H1:** EAD emotion (i.e., anger, sadness, surprise, confusion) and IAD emotion (i.e., hope), respectively, function as sequential mediators in the relationship between college students’ appraisal of a respiratory IDT and protective action taking intention.


H2: EAD emotion (i.e., anger, sadness, surprise, confusion) and IAD emotion (i.e., hope) respectively, function as sequential mediators in the relationship between college students’ appraisal of a sexually transmitted IDT and protective action taking intention.

Method

An online survey was conducted to investigate how college students from two universities differently appraise the levels of predictability, controllability, and responsibility of two types of IDTs. This study also examined the hypothesized sequential-mediator roles of EAD and IAD emotions, respectively, in the relationship between college students’ IDT appraisals and intentions to take protective actions.

Participants and Procedures

A total of 842 U.S. college students participated in the online study, via a participant pool system at a large Eastern public university and a large Southeastern public university in the U.S. The data collection was completed in 2017, prior to the COVID-19 pandemic. There were 299 males (35.5%), 531 females (63.1%), six who identified as other (0.7%), and six preferring not to answer (0.7%). Among participants who reported their race/ethnicity, there were 591 Caucasian (70.2%), 83 Asian/Pacific Islander (9.9%), 71 African American/Black (8.4%), 59 Hispanic/Latino (7.0%), 25 who identified as other (3.0%), and 13 preferring not to answer (1.5%).

Participants read a set of scenarios about two hypothetical IDT types (i.e., respiratory disease and STI). The presentation order of the scenarios was randomized as well. Participants were told about how the given disease is spread (e.g., people with the disease expel droplets of the pathogen into the air when coughing, sneezing, or talking, and others nearby may breathe in or inhale these pathogens) and that the disease could cause mild to severe illness, and at times could lead to death. A list of signs and symptoms were also provided. Although each scenario was written in a slightly different manner to prevent the participant from recognizing the experimental manipulation, disease descriptions (e.g., severity
level, symptoms), other than the IDT type, were consistent across the two scenarios. After reading each scenario, participants completed a questionnaire that contained the measures detailed in the following section.

The study protocols were approved by the Institutional Review Boards where college student participants were recruited via the SONA system, an existing participant pool system that included all students enrolled in undergraduate classes that would grant extra credit for their research participation at the two universities. Students logged onto the SONA system to learn about potential research opportunities, where they saw our recruitment script and decided whether to participate. Students must have been 18 years of age or older to be eligible for this study. After checking a box to indicate they have read the consent form, participants then began the online survey, including scenario reading and questionnaire responding. All students who participated in this study received extra credit for their participation from their enrolled classes.

**Measures**

The questionnaire included items to assess participants’ perceived predictability, controllability, and responsibility of each IDT, and protective action taking intentions, respectively. Participants answered the same set of questions separately for respiratory and sexually transmitted IDTs.

**Perceived IDT Predictability**

Perceived predictability was assessed using five items adapted from previous studies (Brummette & Sisco, 2015; Jin, 2010) on a 7-point Likert scale, ranging from 1 “strongly disagree” to 7 “strongly agree.” Participants reported to what extent different agencies would be able to predict what will happen in the given IDT situation, including individuals, federal health organizations (e.g., CDC), state health organizations (e.g., state departments of health), local health organizations (e.g., county departments of health), and medical and health professionals (e.g., physicians, nurses, and/or pharmacists). An index of perceived IDT
predictability with averaged scores was created for respiratory IDT ($\alpha = .87, M = 4.45, SD = 1.36$) and for sexually transmitted IDT ($\alpha = .86, M = 4.72, SD = 1.33$).

**Perceived IDT Controllability**

Perceived controllability was assessed using five items adapted from previous studies (Brummette & Sisco, 2015; Jin, 2010) on a 7-point Likert scale, ranging from 1 “strongly disagree” to 7 “strongly agree.” Participants reported to what extent different entities would be able to influence what will happen in the given IDT situation, including individuals, federal health organizations (e.g., CDC), state health organizations (e.g., state departments of health), local health organizations (e.g., county departments of health), and medical and health professionals (e.g., physicians, nurses, and/or pharmacists). An index of perceived IDT controllability with averaged scores was created for respiratory ($\alpha = .87, M = 4.62, SD = 1.36$) and for sexually transmitted IDTs ($\alpha = .83, M = 4.82, SD = 1.30$).

**Perceived IDT Responsibility**

Perceived IDT responsibility (i.e., whom to blame for the IDT situation), conceptualized as combined responsibility of individuals, health professionals, and health organizations at local, state, and federal levels, was assessed using five items adapted from Coombs and Holladay’s (2005) study on a 7-point Likert scale, ranging from 1 “strongly disagree” to 7 “strongly agree.” The statements included “the blame for the event of [respiratory/sexually transmitted] disease threat lies with”: “individuals in the circumstance,” “federal health organizations (e.g., CDC),” “state health organizations (e.g., state departments of health),” “local health organizations (e.g., county departments of health),” and “medical and health professionals (e.g., physicians, nurses, and/or pharmacists).” An index of perceived IDT responsibility with averaged scores was created for respiratory ($\alpha = .92, M = 3.50, SD = 1.63$) and for sexually transmitted IDTs ($\alpha = .88, M = 3.85, SD = 1.50$).
Protective Action Taking Intention
A 10-item measure of protective action taking intention adopted from Liu et al.’s (2016) study was presented for participants to respond using a 7-point Likert scale where “1 = strongly disagree” and “7 = strongly agree.” Some of the items included: “I would follow health organizations’ instructions step by step,” “I would seek medical professionals’ advice before deciding to follow any health organizations’ instructions,” and “I would listen for more information from health organization sources.” An index of protective action taking intention with averaged scores was created for respiratory ($\alpha = .87, M = 5.04, SD = 1.10$) and sexually transmitted IDTs ($\alpha = .88, M = 4.88, SD = 1.18$).

External-Attribution-Dependent (EAD) Emotion
Participants were asked to rate the extent to which they were likely to feel each discrete EAD emotion (if they were in the situation) (e.g., Jin et al., 2016; Jin et al., 2014; van der Meer & Jin, 2020), on a 7-point Likert scale ranging from “1 = very unlikely” to “7 = very likely.” An index of EAD emotion was created by computing anger ($M = 4.48, SD = 1.95$), sadness ($M = 4.61, SD = 1.81$), surprise ($M = 4.14, SD = 1.84$), and confusion ($M = 4.40, SD = 1.81$) for respiratory IDT ($\alpha = .83, M = 4.41, SD = 1.50$). An index of EAD emotion for sexually transmitted IDT was also created by averaging anger ($M = 4.50, SD = 1.91$), sadness ($M = 4.42, SD = 1.87$), surprise ($M = 3.81, SD = 1.85$), and confusion ($M = 3.98, SD = 1.90$) ($\alpha = .86, M = 4.18, SD = 1.57$).

Internal-Attribution-Dependent (IAD) Emotion
Participants were asked to rate the extent to which they were likely to feel the emotion of “hope” (the IAD emotion identified, see Jin et al., 2016; van der Meer & Jin, 2020), as measured on a 7-point Likert scale ranging from “1 = very unlikely” to “7 = very likely” for respiratory ($M = 3.44, SD = 1.78$) and sexually transmitted IDTs ($M = 3.75, SD = 1.81$).
Data Analyses

A General Linear Model (GLM) for Repeated Measures and a path analysis using a model-fit approach through Amos 24 were used to answer the study’s research questions and test proposed hypotheses. This study conducted a path analysis because the hope emotion was the only item that did not fit with the requirement of structural equation modeling. Structural equation modeling can use “at least two measured variables as indicators of the latent variable” (Meyers et al., 2013, p. 976).

Results

Based on the within-subjects experimental design, a GLM for Repeated Measures was run to examine how participants’ IDT appraisal (i.e., perceived predictability, controllability, and responsibility) and protective action taking intentions differed as a function of IDT type (i.e., respiratory vs. sexually transmitted). Mediation models through path analysis using a model-fitting approach examined the hypothesized roles of EAD and IAD emotion in mediating the relationship between IDT appraisal and protective action taking intention.

Perceived Threat Appraisal by IDT Type

RQ1.1 asked whether and how college students’ perceived IDT predictability differed by IDT type (i.e., respiratory versus STI). Results showed significant within-subject effects of IDT type on predictability, $F(1, 841) = 38.36, p \leq .001$, partial $\eta^2 = .04$. Participants perceived the sexually transmitted IDT as significantly more predictable ($M = 4.72, SE = .05$) than the respiratory ($M = 4.45, SE = .05$).

RQ1.2 asked whether and how college students’ perceived IDT controllability might differ by IDT type (i.e., respiratory vs. STI). Significant within-subject effects of IDT type on controllability were detected, $F(1, 841) = 20.17, p \leq .001$, partial $\eta^2 = .02$. Participants perceived the sexually transmitted IDT as significantly more controllable ($M = 4.82, SE = .05$) than the respiratory IDT ($M = 4.62, SE = .05$).
RQ1.3 asked whether and how college students’ perceived IDT responsibility might differ by IDT type (i.e., respiratory versus STI). Significant within-subject effects of IDT type on responsibility were evident, $F(1, 841) = 54.20, p \leq .001$, partial $\eta^2 = .06$. Participants perceived higher combined responsibility (i.e., individuals; health professionals; government health organizations at local, state, and federal levels) for the sexually transmitted IDT ($M = 3.85, SE = .05$) than the respiratory IDT ($M = 3.50, SE = .06$).

**Differences in Protective Action Taking Intention by IDT Type**

RQ2 asked whether and how college students’ intention to take protective actions might differ by IDT type (i.e., respiratory versus STI). Results showed a significant within-subject effects of IDT type on intention to take protective action, $F(1, 841) = 29.05, p \leq .001$, partial $\eta^2 = .03$. Specifically, individuals had significantly higher intention to take protective actions for the respiratory IDT ($M = 5.04, SE = .04$) than for the sexually transmitted IDT ($M = 4.88, SE = .04$).

**Sequential Mediation Models by IDT Type**

According to the concept of emotional flow (Nabi, 2015), people’s emotions shift when they are exposed to health messages. Additionally, in terms of attributed-based emotions (Jin et al., 2014), this study further argues people’s emotional shifts occur when they attribute the responsibility for IDTs. To understand how emotional flow impacts the relationship between IDT appraisal and behavioral intentions, we examined the proposed sequential mediator role of EAD emotions (i.e., angry, sad, surprised, confused) and an IAD emotion (e.g., hope), respectively, in the relationship between college students’ IDT appraisal and protective action taking intentions for respiratory (H1) and sexually transmitted IDTs (H2). To do so, we ran mediation models through path analysis using the model-fit approach, which rendered the following results by IDT type.
Respiratory IDT

A variety of goodness-of-fit indices indicated that the estimated model fit the observed data, $\chi^2(4, N = 842) = 37.18, p \leq .001$, with root mean square error of approximation (RMSEA) = .099, which was higher than the acceptable good fit cutoff of .06 (Hu & Bentler, 1999), but less than .10; comparative fit index (CFI) = .97; goodness-of-fit index (GFI) = .99; and normed-fit index (NFI) = .97. The results indicated a good fit for the mediation model.

There were several significant results rendered by the path analysis of using a model-fit approach. First, the significant results from the standardized regression weights showed that perceived IDT predictability ($\beta = .17, p \leq .001$) and perceived IDT responsibility ($\beta = .09, p \leq .001$) were positive predictors for EAD emotions, although perceived IDT controllability ($\beta = .05$, n.s.) was not a significant predictor. Second, EAD emotions (i.e., anger, sadness, surprise, confusion) were a significant positive predictor ($\beta = 1.24, p \leq .001$) for the subsequent IAD emotion (i.e., hope). Lastly, the IAD emotion (i.e., hope) was a significant positive predictor ($\beta = .93, p \leq .001$) for participants’ protective action taking intentions. In sum, the mediation model showed that for the respiratory IDT type, EAD and IAD emotions, respectively, functioned as sequential mediators for the relationship between two key dimensions: participants’ IDT appraisal (perceived predictability and responsibility) and their intention to take protective actions (see Figure 1). Therefore, H1 was supported.

FIGURE 1  Sequential Mediation Model for Respiratory IDT

Note. (1) Overall model fit, $\chi^2(4, N = 842) = 37.18, p \leq .001$, CFI = .97, GFI = .99, NFI = .97, RMSEA = .099. Significant level, * $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$. (2) EAD emotion is an index by computing anger, sadness, surprise, and confusion. IAD emotion is hope.
Sexually Transmitted IDT

A variety of goodness-of-fit indices indicated that the estimated model fit the observed data, $\chi^2(4, N = 842) = 27.77, p \leq .001$, with RMSEA = .08, which was higher than the acceptable good fit cutoff of .06 (Hu & Bentler, 1999), but less than .10; CFI = .98; GFI = .99; and NFI = .98. Results indicated a good fit for the mediation model.

Several significant results were rendered by the path analysis using a model-fit approach. First, the results from the standardized regression weights showed that perceived IDT predictability ($\beta = .10, p \leq .01$), controllability ($\beta = .15, p \leq .001$) and responsibility ($\beta = .09, p \leq .001$) were significant positive predictors for EAD emotions (i.e., anger, sadness, surprise, confusion). Second, EAD emotions were found to significantly and positively predict ($\beta = .92, p \leq .001$) the subsequent IAD emotion (i.e., hope). Lastly, the IAD emotion significantly and positively predicted ($\beta = 1.30, p \leq .001$) protective action taking intention. In sum, for the sexually transmitted IDT type, the mediation model showed that EAD and IAD emotions, respectively, functioned as sequential mediators for the relationship between all three dimensions of participants’ IDT appraisal (i.e., perceived predictability, controllability, and responsibility) and their intention to take protective actions (see Figure 2). Therefore, H2 was supported.

**FIGURE 2** Sequential Mediation Model for Sexually Transmitted IDT

Note. (1) Overall model fit, $\chi^2(4, N = 842) = 27.77, p \leq .001$, CFI = .98, GFI = .99, NFI = .98, RMSEA = .08. Significant level, * $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$. (2) EAD emotion is an index by computing anger, sadness, surprise, and confusion. IAD emotion is hope.
Discussion

This study was launched and completed at two large research universities in the U.S. prior to the coronavirus (COVID-19) pandemic. Our findings provide a picture of how college students respond cognitively, affectively, and behaviorally to two hypothetical IDT situations, in which a respiratory disease and a STI were spreading and threatening students’ health and safety. These findings are valuable baseline evidence that add to the relatively scarce literature on IDT communication on college campuses despite its critical importance. Besides its practical value to health communicators, our study also contributes to risk and crisis communication theory by advancing the new IDT appraisal model (Jin et al., 2020) with a college student sample’s responses to two distinct IDTs.

Challenges and Opportunities for Sexually Transmitted IDT Communication

Our college student participants perceived STIs as significantly more predictable and more controllable than respiratory IDTs. These findings imply that college students tend to feel familiar with and sufficiently educated about STIs, probably due to public health information available on campus and via various channels as well as the availability of vaccines (e.g., HPV vaccine). The transmission mode of STIs is also likely to be perceived as more personally controllable than respiratory infections. This relatively higher sense of personal control over STI risk exposure may explain the higher level of blame our participants assigned to responsible parties for STI situations. It seems that for college students, STI causes and transmission routes are broadly familiar. Therefore, college students expect STI threats should be taken care of by people who themselves are at risk, together with health professionals and health agencies to control and prevent disease transmission.

However, compared to their responses to the respiratory IDT, our college student participants reported significantly lower levels of intentions to take protective actions against the STI. This finding echoes prior research on optimistic bias among college students (e.g., Afifi & Weiner, 2006; Best et al., 2018), which occurs when
individuals disconnect their disease prevention knowledge from preventative behaviors they can take. Therefore, when it comes to communicating about STIs to college students, the emphasis should lie in (a) conquering the optimistic bias caused unintentionally by existing knowledge and false confidence in one’s invincibility, (b) motivating college students to take preventive actions as early as possible, and (c) shifting the blame from others for disease prevention and control responsibility to having students take personal responsibility for a controllable event.

**Challenges and Opportunities for Respiratory IDT Communication**

Before the COVID-19 pandemic, our college student participants perceived a respiratory IDT as significantly less predictable and less controllable than a STI. This indicates that the transmission mode of the disease itself evokes high uncertainty and higher risk perception, compared to STIs. We speculate that the unpredictability and uncontrollability of respiratory IDTs are perceived as even higher now given the COVID-19 situation and the high uncertainty as well as high inconsistency of COVID-19 communication (e.g., Bogel-Burroughs, 2020; Kafka, 2020).

Our participants also perceived lower levels of IDT responsibility (or much less blame assigned to at-risk individuals, health professionals, and government health organizations) for the respiratory IDT than for the sexually transmitted IDT. This finding sheds light on the importance of providing timely and accurate information on the disease itself and who is in charge of disease prevention and control (Seeger, 2006), as well as how college students themselves can participate effectively and confidently in the prevention process (Lee et al., 2018). For example, to increase adherence to protective behaviors against the spread of COVID-19, experts have encouraged decision makers to “use clear, consistent, and transparent messaging” and to “foster a sense of efficacy and avoid fatalism” (National Research Council, 2020, p. 1). In light of current COVID-19 crisis and future respiratory IDTs, university leaders and health officers should focus on lowering uncertainty (thus increasing college students’ perceived predictability
and controllability of the situation). For example, they can provide information about free or low cost COVID-19 testing, contact tracing, and other efforts to mitigate the disease threat.

University leaders and health officers also can foster a sense of self-responsibility among college students so that they can better protect themselves and help protect others when possible. For example, communication may convey information regarding social disapproval of failure to comply with recommended guidelines for disease prevention, such as wearing masks and maintaining social distancing, and strategies to present preventative behaviors as part of students’ habitual responsibilities (e.g., placing hand sanitizer near the door and encouraging hand sanitizing each time people enter the room) (National Research Council, 2020).

Compared to sexually transmitted IDT responses, our participants indicated significantly higher intentions to take protective actions against a respiratory IDT. For health communicators and university leaders, this high motivation for self-protection is a solid base for effective respiratory IDT (e.g., COVID-19) communication. To capitalize on the momentum of college students’ desire to take timely and recommended actions, IDT messages should provide accurate information from credible sources, clear instructions conveyed in concise and engaging language, and provide consistent recommendations for college students to follow, as evidenced in prior research on HPV (Nabi & Prestin, 2016) and flu-vaccine communication (Lee et al., 2018) among college students. It might also be helpful to encourage college students to share information such as how to take proper protective actions with their peers who likely have similar respiratory IDT appraisals and need similar cognitive and behavioral support.

**Strategic Value of Emotional Sequencing in IDT Communication**

Across the two types of IDTs, we observed similar patterns that suggest the strategic value of emotional sequencing for IDT strategic communication. First, as Jin et al. (2014) argued, emotions and measures of emotions are highly context-specific. Built upon existing emotions identified by crisis and health scholars (e.g., Jin,
et al., 2016; van der Meer & Jin, 2020), our study advocates for the importance of identifying emotions and affective responses that are most relevant and especially pertinent to IDTs. As the first attempt, we focused on attribution-dependent emotions and created EAD and IAD IDT emotion clusters. For both IDTs, the “IDT appraisal → EAD emotion → IAD emotion → behavioral intention” sequential mediation model was supported. Such findings imply that, when confronted by these two IDT types, college students’ IDT appraisal will first lead to external-attribution-triggered affect, which can be a combination of anger, sadness, surprise, and confusion. From there, such negative emotions triggered by the situation motivate individuals to take control of the situation and foster a sense of hope, which subsequently triggers increased intentions to take protective actions. This observed pattern highlights the power of emotions in health risk and crisis communication and how affect, even when negative, can be channeled into a positive force (e.g., hope) that is future-oriented. Such future-oriented mental and emotional positions seem to pave a promising path for understanding college students’ protective action taking.

Comparing the two mediation models, we observed some differences in the way college students appraise respiratory and sexually transmitted IDTs. For the sexually transmitted IDT, all three appraisal dimensions (i.e., predictability, controllability, responsibility) tended to be positive predictors of EAD emotions. However, for the respiratory IDT, only predictability and responsibility led to EAD emotions. Perceived controllability of a respiratory IDT does not seem to impact EAD emotions, which merits future research to provide further evidence-based explanations.

The insights from our sequential mediation models, centering on the critical “connector” role different IDT emotions (EAD and IAD) play in triggering desired behavioral outcomes, provide practical recommendations for health communicators. To be effective and relatable to college students, IDT communication messages need to convey relevant information that is emotionally engaging and motivates individuals to make the connection between IDT appraisals and protective action taking. In addition to having only one focal emotion as the affective appeal throughout an
IDT communication campaign, health communicators can consider identifying multiple primary emotions to be embedded in their messages to first alert college students and then cultivate a sense of optimism and hope to motivate them to take protective actions. This is indeed a mixed-emotions approach for health persuasion, which can address some of the side effects of health risk message over-exposure (e.g., Kinnick et al., 1996; So et al., 2017). For example, in studying AIDS/HIV message effects, Kinnick et al. (1996) found that long-term exposure to issue-related messages led to apathetic feelings and emotional burnout regarding the health issue itself. So et al. (2017) reported that repeated exposure to obesity-related messages made individuals feel exhausted and bored, which consequently made them disengaged from and resistant to be involved in future messages regarding the same issue. By sequencing emotional appeals and anticipating sequenced affective responses, an IDT prevention message can avoid (a) creating emotional fatigue and (b) affective overload.

**Limitations and Future Directions**

This study has several limitations. First, survey participants were college students from two U.S. universities. Thus, the findings are not generalizable to other college students in other universities or in other countries or cultural contexts.

Second, we only examined two IDT types differentiated by the mode of transmission. How college students respond to other IDTs (e.g., foodborne, waterborne, and vector-borne) needs to be examined in the future.

Third, to improve the new IDT appraisal model, the interconnection and mutual influence between the three IDT dimensions (i.e., predictability, controllability, and responsibility) should be further investigated.

Fourth, this study only measured emotional responses to attribution-dependent crisis emotions. Future studies should measure attribution-independent crisis emotion as well as investigate how crisis emotions form and evolve over time. Future research also should investigate how to maximize emotions’ role in motivating behavioral changes.
Fifth, this study includes self-reported data, but the study design could only measure individuals’ intentions to take preventive action instead of actual behavior. Thus, future studies should consider conducting longitudinal research, as funding allows, to examine how people take action in response to IDTs over time.

Sixth, the study did not measure participants’ motivations to think about IDTs. The survey was not conducted during a flu season or amid the COVID-19 pandemic, and thus the stimulus outbreak messages may not have triggered as much motivations to read and respond to as health messages seen during serious IDT situations. Building on the model tested in this study, future research should consider devising more naturalistic study designs and adding motivational variables into the IDT appraisal model.

Seventh, our study did not ask participants whether they were sexually active. Future research should include such a measure and examine how the varied levels of college students’ sexual activity might impact their risk and threat perceptions. The history of STIs was not captured in our study but could have influenced our findings in terms of an optimism bias.

Lastly, how the COVID-19 pandemic and universities’ various communication efforts have impacted current and future college students’ responses to respiratory and other IDT types overall merits ongoing assessment and longitudinal examination. In particular, the COVID-19 pandemic is a unique opportunity to examine how college students and others respond to ever-present IDTs (e.g., STIs) during rarely-occurring threats (e.g., respiratory diseases).

**Conclusion**

Universities face frequent crises including natural disasters, active shooter incidents, scandals, and infectious disease outbreaks (Moerschell & Novak, 2020). A broad body of scholarship informs how college students cope with STIs (e.g., Lin & Lagoe, 2013; Vorpahl & Yang, 2018; Yang, 2015), but less is known about respiratory IDTs. Findings from this study contribute to our limited understanding of how college students respond to respiratory
IDTs, compared to STIs. In turn, these findings inform public health messaging during outbreaks.

Importantly, our findings indicate that communication about STIs must combat optimistic bias through early and repeated interventions that focus on students’ personal responsibility for a controllable, but frequent risk. Communication about respiratory IDTs should focus on lowering uncertainty, thereby increasing students’ efficacy to reasonably combat less frequent threats.

Communication about respiratory IDTs also must harness college students’ elevated intentions to take protective actions through providing clear, credible, consistent, and engaging information about the best mitigation actions to protect themselves and others. Communication about both IDT types needs to be cognitively relevant to students, emotionally engaging in a positive way, and motivating to connect students’ threat appraisals to reasonable protective actions they can take. While crises are frequent on college campuses, effective risk and crisis communication can mitigate negative outcomes.

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Editor’s Essay: Moving beyond Western Corporate Perspectives: On the Need to Increase the Diversity of Risk and Crisis Communication Research

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ABSTRACT

The field of crisis and risk communication research has experienced significant growth and increasing institutionalization in the past decades. However, there are still geographic and perspective blind spots. Up to date, by far the most research focuses on the U.S.; non-Western perspectives remain marginal. Moreover, the focus on organizational crises still clearly dominates. We therefore call for more research better reflecting the global environment and diverse crisis and risk contexts in which our field can make contributions. This argument is supported by the current pandemic mandating cross-cultural and multi-perspective approaches.

KEYWORDS: crisis communication, risk communication, internationalization, comparative research

In a reflection on his own experience in practice as a risk communication consultant to the WHO Health Emergencies Programme, Ben Duncan makes the argument that in his view crisis communication had evolved from being “corporate public relations” to a life-saving intervention (Diers-Lawson, 2020). In the last several years, we have seen good evidence of this evolution with crisis communication research and theory applied...
in the context: of post-Ebola epidemics in Africa (Tambo et al., 2017); communication challenges of terror crises (Ruggiero & Vos, 2015); natural disasters (Romascanu et al., 2020) including the role of social media during disasters (Dahal et al., 2020); industrial disasters (Utz et al., 2013) and other types of emergencies (Wukich & Mergel, 2015).

We are also seeing the field broaden in its geographic reach with research published addressing crises from different geographic and cultural experiences such as exploring the role of crisis and social media for social movements in Mexico (Sandoval-Almazan & Gil-Garcia, 2014); food safety in New Zealand (Galloway et al., 2019); news coverage of terrorism in Norway (Falkheimer & Ols- son, 2015); and an exploration of stakeholder engagement affecting the hospitality and tourism industry in multiphase disaster management in Africa (Granville et al., 2016). Despite these evolutions in the field broadening its scope beyond corporate-focused public relations, increasingly representing diverse geographic and cultural experiences, we acknowledge that there is still work to do. As we look ahead to our tenure as the editorial staff over the next two volumes, our aim is to continually critically reflect on the field and identify the areas of development needed as crisis and risk communication continues to be institutionalized. This is precisely what Seeger (2018) and Liu (2019) set out as priorities in establishing and developing this journal, and we aim to continue. We also argue that as the world faces increasing levels of uncertainty attributable to mega-crises like the COVID-19 pandemic or pan-regional and localized crises like the 2020 fires in Australia; continued refugee crisis in North Africa, the Middle East, and Europe; Brexit in the UK; water crises affecting countries across Latin America; or social and political volatility in the United States it is imperative that our field continues to broaden its scope to explore, understand, and help manage the problems affecting people around the world.

Therefore, in this editorial we:

1. Critically reflect on the growth and institutionalization of crisis and risk communication
2. Address existing geographic and thematic biases in crisis and risk communication
3. Call for more research better reflecting the global environment and diverse crisis and risk contexts in which our field can make contributions
4. Connect the contributions of this issue to the continued development of the field.

Growth and Institutionalization of Crisis and Risk Communication

Of course, the COVID-19 pandemic has underscored the importance of crisis and risk communication and, as a field, we are working to make sense of the contributions that we have and can make to that field with our research—like the journal’s forthcoming special issue on the COVID-19 pandemic edited by Dr. Yan Jin. However, before the COVID-19 pandemic, the field of crisis and risk communication was showing strong evidence of its global growth and institutionalization. We are a diverse and multidisciplinary field that is regularly published in hundreds of different journals using theories ranging from those developed for crisis and risk communication to traditional persuasion and communication, management, health, educational, cultural, media, and leadership theories to name just a few (Diers-Lawson, 2020). During specialty conferences like the bi-annual crisis series sponsored by the European Communication, Research, and Education Association or the annual International Crisis and Risk Communication Conference hosted by the University of Central Florida, in 2019 and 2020 colleagues from at least 20 different countries and all continents participated and presented their work. Across the journals publishing crisis communication research, there are more than 55 countries represented across the continents (Diers-Lawson, 2020). However, we need to acknowledge the field has both geographic and thematic bias and this is important to address both as a field and also as a journal.
Geographic and Perspective Bias

While the participation in the field, its global growth, and its increasing institutionalization and recognition is certainly worth celebrating we also know that there is more work to do to ensure the published research reflects more of the reality of the broad global participation we can evidence. For example, as Diers-Lawson (2020) documented there are significant geographic and perspective biases in the field that are also reflected in this journal as well.

**Geographic Bias**

Much of the early and foundational research in crisis communication came from the United States, spreading to Europe, and then Asia—especially China. In fact, from the 1950s to 2015 there was a disproportionate representation of the United States with about 67% of journal-based research published that was focused on American crises, organizations, or contexts (Diers-Lawson 2017; 2020). While the trends are changing and generally the field is seeing more research published in journals, books, and collections from other countries, there remains a focus on industrialized countries and especially the “Western” perspective. The global South is underrepresented. This is also true of the *Journal of International Crisis and Risk Communication Research* as well. In reviewing articles published across the first three volumes that used data, while the journal demonstrates more proportional geographic diversity compared to the whole field, we still have work to do to reduce the bias on crisis in industrialized countries and especially the United States (see Table 1).

**Perspective Bias**

Though the field of crisis and risk communication is multidisciplinary, most of the research has been published largely in traditional public relations, communication, management, and social science journals (Diers-Lawson, 2020). Not surprisingly, the field often focuses on organizational or public relations perspectives,
thus it has an organizational bias. The organizational bias often means that the objectives for analysis is how to better the organization’s ability to respond to a crisis, protect its reputation, and minimize the impact of the crisis on the organization. By extension, those interests can connect to interests of external stakeholders like media, politics, or health. This is also true in the context of the Journal of International Crisis and Risk Communication Research; however, the journal has developed a stronger balance between the organizational bias, stakeholder-focused research, hybrid or social media research, and non-organizational crises (see Table 2). We argue that crisis and risk communication has meaningful contributions to make to understanding and addressing “wicked” or persistent problems that are affecting people globally ranging from climate change, disasters, injustice, economic deprivation, globalization, politics, health epidemics and pandemics, as well as specific organizational crises. As the field continues to institutionalize, we argue that it should focus on studying issues of risk and crisis more than being a field that studies organizations in crisis. Especially important in this regard is the role of the broad media environment in understanding and influencing crisis and risk communication.

### TABLE 1 Geographic Distribution of Crisis Communication Research (by percentage)

<table>
<thead>
<tr>
<th>Region</th>
<th>Crisis Communication 1950–2015¹</th>
<th>JICRCR Vol 1–3</th>
</tr>
</thead>
<tbody>
<tr>
<td>North America</td>
<td>67.8%</td>
<td>64%</td>
</tr>
<tr>
<td>Europe</td>
<td>18.6%</td>
<td>11%</td>
</tr>
<tr>
<td>Asia &amp; Australasia</td>
<td>13.4%</td>
<td>11%</td>
</tr>
<tr>
<td>Africa</td>
<td>1.2%</td>
<td>6%</td>
</tr>
<tr>
<td>Central &amp; South America, Caribbean</td>
<td>.9%</td>
<td>6%</td>
</tr>
<tr>
<td>Middle East</td>
<td>.9%</td>
<td>3%</td>
</tr>
</tbody>
</table>

Notes: ¹Data about the field taken from Diers-Lawson, 2020
²North America includes 66.9% from the U.S. and .9% from Canada
TABLE 2 Perspective Focus in the *Journal of International Crisis and Risk Communication Research* (by percentage)

<table>
<thead>
<tr>
<th>Broad Perspectives</th>
<th>JICRCR Vol 1–3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organizational/Corporate Focused</td>
<td>42%</td>
</tr>
<tr>
<td>Media Focused</td>
<td>6%</td>
</tr>
<tr>
<td>Stakeholder Focused</td>
<td>19%</td>
</tr>
<tr>
<td>Hybrid (Social Media)</td>
<td>10%</td>
</tr>
<tr>
<td>Non-Organizational Crises (e.g., health, environment)</td>
<td>23%</td>
</tr>
</tbody>
</table>

**Broadening the Voices and Contexts for Research in 2021–2023**

Our call for research for the next two volumes—4 and 5—of the journal is to broaden the voices and contexts for research in crisis and risk communication. We have already broadened the editorial board, adding colleagues representing organizations in an additional seven countries, bringing the representation on the board to 17 countries from all continents. However, this is not enough, we also encourage high quality submissions reflecting the diversity of experience, geography, and research foci appropriate within crisis and risk communication research. In particular, we would invite more international or comparative research and more research reaching beyond the organizational perspective.

**Call for More International and Comparative Research**

As we consider the future of crisis and risk communication research, we posit three arguments for the value of increasingly international and comparative research. First, *the field will improve its theory building* when existing theories are applied in new cultural contexts. For example, in the first three volumes, the *Journal of International Crisis and Risk Communication Research* published 14% of multinational comparisons, which provided important analysis, for example, about how different countries communicate risk about crisis and war (Petridou et al., 2019). These types of comparisons provide stronger understanding of risk and crisis as
culture-sensitive concepts. However, we would encourage more of these comparisons over the next two volumes.

Second, expanding our understanding of different types of crisis across cultural and national settings provides epistemological value as well. There is no doubt that in the years to come there will be many pieces written about Trump’s America and about the ways that disproportionately negative effects of the pandemic have been felt on the poor and disenfranchised populations around the world. Similarly, there is a fundamental need to deepen research and understanding of crisis and risk communication across the global South—in particular, there is a fundamental dearth of research relevant to Central and South America and Africa in our field and this needs to improve. However, geographic and cultural blind spots occur even in North America, where crisis and risk communication research amongst indigenous communities is virtually nonexistent. Likewise, in Europe there are blind spots as well. For example, both Scotland and Catalonia have independence movements whose arguments for independence are cultural, are rooted in colonialism, deeply held identities, and where crises like Brexit and the pandemic bring to the fore inequalities and challenges within the countries. Moreover, exploration of these from the context of risk and crisis would explore the political and complex contexts and provide a deepening of our understanding of crisis and risk.

Third, it seems clear that more international and comparative research would provide important practical lessons to be applied in crisis and risk communication research. For example, Asia has seemingly more experience in managing pandemics like MERS and SARS and during the COVID-19 pandemic has been more successful in suppressing the virus compared to all other regions (see Figure 1), including Europe and North America (see Figure 2), which would suggest there are critical practical lessons in crisis and risk communication that should have already been learned, but were not. In looking ahead to future global crises, a stronger international and comparative approach in crisis and risk communication could improve the base level knowledge of those managing the crises.
FIGURE 1  Regional Comparison of COVID-19 Deaths

Total confirmed COVID-19 deaths

Limited testing and challenges in the attribution of the cause of death means that the number of confirmed deaths may not be an accurate count of the true number of deaths from COVID-19.

FIGURE 2  COVID-19 Deaths Comparison between Select Asian and Western Countries

Cumulative confirmed COVID-19 deaths

Limited testing and challenges in the attribution of the cause of death means that the number of confirmed deaths may not be an accurate count of the true number of deaths from COVID-19.
Call for Research Looking Beyond the Organizational Perspective

In considering crisis and risk communication research, there will always be a need for research and theory development that focuses on the organizational context; addressing, for example, issues of responding effectively to crises in order to protect an organization’s reputation, objectives, and stakeholders. As such, we strongly support the *Journal of International Crisis and Risk Communication’s* relative excellence in publishing research across multiple perspectives including stakeholder and social media. However, we would encourage more research on non-organizational crises (e.g., health or political crises). We would also welcome more research on the broad role of the media environment’s contribution to crisis and risk communication as this has been the perspective least explored in the previous three volumes. For instance, important yet understudied questions include: What is the role of media systems and journalism cultures in shaping the discourse on risk and crisis—and how is it affected by ad hoc publics and misinformation on social media? However, more than just considering traditional domains of communication research, we would also encourage the exploration of crisis and risk communication from genuinely multidisciplinary perspectives that might join computer scientists, the medical or scientific research communities, political expertise, or certainly sector-specific research providing insights into the communicative needs in crisis contexts.

Connecting the Contributions of Volume 4, Issue 1 to Our Calls for Research

The five pieces in this volume reflect an excellent starting point in meeting the calls for the impact and diversity in perspective, theme, and geography that we have discussed to this point. Each of the articles in this volume develop our understanding of the stakeholder perspective in different ways. Jin, Lee, Liu, Austin, and Kim’s analysis of infectious disease threat assessment by college students is a timely contribution as universities around the world are trying to manage the pandemic’s effects on their campus...
communities and delivery of courses. Jong and Brataas’s piece explores the importance of treating victims of crises as stakeholders with valuable interests in the resolution of crises of different types. Oh, Yoo, and Owlett take an organizational perspective, but one that focuses on the importance of using social media to focus on person centered messages in public relations. Miller, Collins, Neuberger, Todd, Sellnow, and Bouteman’s systematic review of the global CERC literature provides insights into the theory’s development and application that provides reflection and a future orientation on how crisis, emergency, and risk communication can be developed into the future. Finally, Jun and Jin’s risk toleration scale development provides a new tool for exploring people’s tolerance of health risks. Though each of these pieces provides value within the stakeholder perspective, they also connect social media, non-organizational, and organizational contexts to better explore the interconnections in crisis and risk communication research. Two of the pieces—Jong and Brataas and Miller et al.’s—also represent the international or comparative perspectives we are calling for as well.

We look forward to the excellence in the submissions, appreciate our editorial board and reviewers, supporting and encouraging the growth and diversity of interest in crisis and risk communication research.

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