THIS IS NOT A DRILL: Mobile Telephony, Information Verification, and Expressive Communication During Hawaii’s False Missile Alert

Rich Ling1O and Brett Oppegaard2O

Abstract
On Saturday, 13 January 2018, residents of Hawaii received a chilling message through their smartphones. It read, in all caps, BALLISTIC MISSILE THREAT INBOUND TO HAWAII. SEEK IMMEDIATE SHELTER. THIS IS NOT A DRILL. The message was mistakenly sent, but many residents lived in a threatened state of mind for the 38 minutes it took before a retraction was made. This study is based on a survey of 418 people who experienced the alert, recollecting their immediate responses, including how they attempted to verify the alert and how they used their mobile devices and social media for expressive interactions during the alert period. With the ongoing testing in the United States of nationwide Wireless Emergency Alerts, along with similar expansions of these systems in other countries, the event in Hawaii serves to illuminate how people understand and respond to mobile-based alerts. It shows the extreme speed that information—including misinformation—can flow in an emergency, and, for many, expressive communication affects people’s reactions.

Keywords
false Hawaii missile alert, emergency alerts, mobile communication, news verification, expressive interaction

Introduction
At 8:07 a.m.1 on a sunny Saturday morning, 13 January 2018, about 1.5 million people in the state of Hawaii received the following terse text message, in all caps, through their mobile phones.2

Emergency Alert:

BALLISTIC MISSILE THREAT INBOUND TO HAWAII. SEEK IMMEDIATE SHELTER. THIS IS NOT A DRILL.

Residents of the state had been on edge for months about the growing international tensions between the United States and North Korea, with Pearl Harbor-era sirens being tested and “ballistic missile preparedness” programs being offered. As a part of this program, people were told in broadcast messages that they had roughly 12–20 min from the time an alarm was sounded to the first potential impacts of a missile attack. The text of this 13 January alert contained many of the standard and significant elements of an alert message, that is, hazard, location, guidance, time, and source (Bean et al., 2015). The information also was sent to the state’s television stations, appearing as a scrolling banner on screens tuned to local, but not national, channels. Notably, the message that was sent in error was caused by a lone individual, pressing the “wrong button” during a system test.

Understandably, this alert caused strong reactions:

I was awake but in bed, when I heard the beeping from my iPhone. I was stunned for a moment and frozen. I read; then reread “This is not a drill.” I called for my husband. [. . .] I beckoned for him to come close, and I said, I love you. Goodbye. If I have wronged you in any way, I’m sorry. Thank you for all you have done for me. (Female, 61–70 years)

While some were deeply disturbed by the alert, others immediately found it implausible or instituted “fear control,” as described by Gutteling et al. (2018):

Corresponding Author:
Rich Ling, Wee Kim Wee School of Communication and Information, Nanyang Technological University, 31 Nanyang Link, Singapore 639626. Email: riseling@gmail.com

1Nanyang Technological University, Singapore
2University of Hawai‘i at Manoa, USA

Copyright © The Author(s) 2021
Article reuse guidelines:
sagepub.com/journals-permissions
DOI: 10.1177/2056305121999661
journals.sagepub.com/home/sms

Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-NonCommercial 4.0 License (https://creativecommons.org/licenses/by-nc/4.0/) which permits non-commercial use, reproduction and distribution of the work without further permission provided the original work is attributed as specified on the SAGE and Open Access pages (https://us.sagepub.com/en-us/nam/open-access-at-sage).
Heard the Ping, looked at the phone, noticed it was an “Emergency Notice.” Read it with mild interest, rolled my eyes, snorted a laugh, and went back to sleep. [...] After a few phone calls to assure people all is well, grab[ed] my book, couple of green bottle recreational beverages, and headed for the beach. If it was real, there’s no better place to be, to watch the “fireworks” and try to catch the 50+ foot wave that would result from the blast. (Male, 51–60 years)

While the alert seemed inconceivable for some, according to the report of the Federal Communication Commission, for many others, the message caused “38 minutes of confusion, fear, and uncertainty.”

Such media-induced anxiety is not uncommon at either the interpersonal or the social level (Gantt & Gantt, 2012). While disaster-induced panic is rare (Clarke, 2002), it can develop, particularly when there is the perception that opportunities for safety are closing (Gantt & Gantt, 2012; Slovic et al., 2007). The mobile phone has evolved into a conduit through which these messages are sent and received (Cohen & Lemish, 2005; Katz & Rice, 2002; Ling et al., 2018). The power and reach of mobile-based alert systems are growing, reverberated, and amplified by social media systems. In the United States, the Emergency Alert System allows the country’s president to text message—at one time—every reachable mobile phone in the nation. We, therefore, consider the specious alert in Hawaii as a harbinger of critical communication issues that will emerge in a state of such powerful and direct messaging. This event illustrates the extreme speed with which information (and disinformation/misinformation) can flow through a variety of personalized and intimate channels. These messages furthermore can have a significant impact on relationships in their closest social spheres.

Hawaii’s statewide Emergency Alert System is designed as a multimodal spray of immediate communication through private and public media channels. This bricolage includes text messaging (across carriers and devices), audible and visible television messages (as lower third graphics and text crawls), and radio warnings (interrupting broadcasts). As a legacy of the Second World War in Hawaii, this system even includes a network of public sirens that are regularly tested.

This broadly inductive study examines how people reacted to an urgent and widely diffused digitally mediated emergency message heralding an imminent—albeit false—catastrophe. It addresses questions about the message’s authenticity, residents’ verification strategies, and how the message played into issues of group cohesion. Other work has discussed these dynamics in trial or hypothetical situations. The work here instead provides a real-life study of an authentic public response to an alarm; albeit one that was ultimately false.

We examined how people reacted to the alert as well as how they used their devices or media channels to either verify or discount the information. We also consider here how people used their smartphones and social media networks to reach out to their closest loved ones during this unsettling event. This focus helps to illuminate how people react to emergencies and how mobile communication has restructured interactions within our closest social spheres. The analysis illuminates the efficacy of mobile-based emergency alerts (or lack thereof). Furthermore, it extends Randall Collins’ (2004) work regarding the role of crisis in the definition of the intimate sphere.

These findings, all gathered within a month of the event, allow examination of authentic responses in a real setting (Bean et al., 2015). In addition, we were able to examine the velocity of information flow during this alert period. The comments of the informants show that the information was posted and re-posted to media channels, especially social media networks, throughout the state in a matter of minutes. Bruns et al. (2012) suggest that verified crowd-sourced information often emerges during disasters. Such a verification process, however, can take time. The simple velocity with which this situation unfolded precluded this. Relatedly, the event shows how each of us has our own particular “information flora.” That is, in our highly mediated world, we each have a somewhat unique—but also an overlapping—set of information channels. The information we receive can be broadly consistent, but it is nonetheless multifaceted and individually tailored. This can lead to inconsistencies that are amplified when we, for example, give more credence to messages from our closest ties. Finally, in a contribution to the theory of social solidarity, we consider how dramatic social situations can become crystallized into emotionally charged legacy events that mark and shape our interpersonal relationships.

**Literature Review and Research Questions**

A disaster is “a potentially traumatic event that is collectively experienced, has an acute onset, and is time-delimited; disasters may be attributed to natural, technological, or human causes” (McFarlane & Norris, 2006, p. 4). Disasters can be “acts of God” or human-caused. They can have a wide or narrow impact and have different temporal dimensions (Berren et al., 1980; see also Quarantelli, 1988). The false missile alert in Hawaii clearly was human-caused; it came and passed quickly but had widespread and diverse impacts during its eruptive moment; despite it ultimately being a faux event.

Scholars across disciplines have studied the effects of disaster media coverage on subsequent stress (Houston et al., 2018) and on communication during disasters (Figley & Jones, 2008; Vieweg et al., 2008). The false missile alert in Hawaii had several unique dimensions, including its immense potential consequences (a nuclear explosion) and the nature of the warning that was simultaneously and unexpectedly spread to all mobile devices in a large area. Also, we can see...
and document links between the more broadcast-like dimensions of the alert system and the secondary diffusion effects, through social media, including the relaying of information to remote family and friends (DeYoung et al., 2019).

The material that follows focuses on individuals’ patterns of information seeking, emotional responses, and intimate disaster response, including social media (Correa et al., 2016; DeYoung et al., 2019; Monahan & Ettinger, 2018). We identify the following three often overlapping questions, namely, (1) the believability of the mobile-mediated alert ipso facto, (2) the subsequent verification activities, and (3) the socio-expressive reaction to the alert. These are not mutually exclusive categories, rather they represent different foci in the comments of the informants.

Believing the Alert

An immediate question is whether people believed the mobile alert. Indeed, the effectiveness of the mobile alert system is founded on the idea that people will accept or believe the information (DeYoung et al., 2019; Gow & Waidyanatha, 2009; McGee & Gow, 2012). The literature on mobile alerts shows that initial reactions to mobile emergency messages can include confusion (Bean et al., 2016), disbelief, worry, fear (Wong et al., 2018), and skepticism.

In research settings, people report that they generally believe mobile alerts from public authorities (Quinn et al., 2013; Wong et al., 2018) and that belief will improve if confirmed through TV, radio, or the internet. Using focus groups, Bean et al. (2016) found that mobile message composition and length are critical when considering the effectiveness of mobile alerts. Longer messages were taken more seriously (Wood et al., 2018), and they reduced the tendency to “mill” (DeYoung et al., 2019). Furthermore, mobile messages that outline the nature of the hazard and specific locations also are more effective (DeYoung et al., 2019; Wong et al., 2018). Following Mileti (1999), effective messages include source, guidance, hazard, location, and time. Thus, our first research question is What factors led people to believe (or discount) that the missile-alert was a legitimate message ipso facto?

The Social Dimensions of Alert Confirmation

Moving beyond the alert itself, we asked, how do people confirm and act on the information being shared? Mileti (1999; see also Bean et al., 2016; Drabek, 1969; Gow et al., 2009; Mitchell et al., 2010) argued that there is a fundamental human need to confirm emergency alerts. The response to alert messages typically emerges from either confirming or refuting the message using other information—for example, legacy news, ambient cues (e.g., sirens), trusted social ties—or their own sense of the situation (Cantril, 1940; Vihalemm et al., 2012). Wood et al. (2018) suggest that there is a social process associated with receiving mobile alerts that includes understanding and verifying the situation followed by associating the information to one’s situation before deciding on an action.

Drabek and Stephenson (1971) noted that an important part of our reaction is taking into consideration our primary group, an activity that is enhanced by mobile telephony. This plays on the idea of social validation as described by Milgram et al. (1969). Calls to close social ties during emergencies are used to share real-time information and news (Cohen & Lemish, 2005; Dutton & Naiona, 2003; Katz & Rice, 2002), to communicate expressive messages, and to make sense of the situation in real-time. Ling et al. (2018) found that people called their strongest ties in the immediate wake of a bombing in Oslo. In combination, victims of disasters are interested in receiving information directly from their loved ones as well as information provided by authorities.

People put high importance on immediately interacting with their closest sphere during disasters perhaps even before making other decisions. Weick (1988, 1993) sees this response as the mechanism with which people determine whether (or not) to dramatically mobilize. This leads to our second research question: How did people verify the missile alert? And, in more specificity, how did they use local interaction, broadcast, social media, and mobile-mediated information to verify the missile alert?

Instrumental versus Expressive Interpersonal Communication

As noted earlier, for some people, communication with their intimate sphere was unusually emotional and intense during the missile alert. Indeed, people often feel that these interactions are more important than interpreting communications broadcast from public authorities (Sorensen & Sorensen, 2007). The primacy of these interactions and their potential to interfere with official information is a central issue. Because of their very ubiquity, mobile phones provide immediate access to the broader society (through which the emergency alert was broadcast), through social media, as well as to our closest social sphere (Cohen & Lemish, 2005; Ling et al., 2018). This dynamic can facilitate the distribution of public information. Importantly, it is also a channel through which we can contact trusted loved ones during troubling times. Drabek and Stephenson (1971), as well as Ling et al. (2018), note that these strong ties are of special importance. Drawing on Durkheim (1995) and Goffman (1967), Collins has described how crises and disasters, and the resultant interpersonal interaction within the closest social sphere, can become a catalyst for group cohesion. Indeed, it can become a defining element in the social group. However, this urge can also impede the efficacy of the emergency information. Thus, the third research question is How did people use their mobile devices during the alert for expressive interactions?
Method

The data for this analysis were collected through an online questionnaire with a large portion of open-ended questions sent to a non-random, convenience sample of residents in Hawaii. The sample was based on a sampling frame from Qualtrics. The data collection began on 28 January and continued through 28 February 2018. The primary focus during data collection was to capture the qualitative experience of residents as quickly as possible in the wake of the event. Because of its consequential nature and, for many, the high degree of emotion, the missile alert likely resulted in “flashbulb memories” (Brown & Kulik, 1977; see also Conway, 2013). Nonetheless, we were interested in capturing the recollections of the respondents as quickly as possible.

We do not claim generalizability for the material examined here. We were interested to hear the stories of the respondents, as freshly as possible, as they recalled them and wove them into their life narratives. The overriding methodological consideration was to capture the immediate thoughts and memories of the event among people who experienced it firsthand and in closest proximity to the threat, with the intention of carrying out an inductive analysis of the material. In addition, some basic demographic material was gathered (see Table 1).

The questionnaire contained largely open-ended questions. The first substantive question (open response) in the questionnaire, for example, was “How did you react when you received the warning? Can you walk me through the period between when you received the information until you received the ‘all clear’, with as much detail as possible?” This question allowed the respondents to relate their immediate response, which also addresses the first research question. However, the narratives also often described verification strategies that were used and their social or psychological intertwining with other reactions. Respondents also were asked closed and binary yes–no questions, such as whether they believed the emergency message when they received it.

The second research question was examined by using an open response question asking the respondents whether they had been in touch with “others during the alarm-scare period?” We asked them to tell us about this interaction in as much detail as possible.

A total of 418 valid and completed responses were recorded. Despite our efforts to seek diversity, there is an overrepresentation of 31- to 40-year-olds and an underrepresentation of people 61 years and above, when compared to the general population of Hawaii. In terms of sex, 44.2% were male and 55.7% were females. Asian Americans (38.5%), European Americans (33.5%), and Polynesians (10.5%) were the major ethnic groups. For educational levels, 60.5% of the respondents had an associate degree or higher, and 26.8% had some college experience.

The closed-category questions were examined using SPSS, while the open qualitative questions were read in their entirety and examined for emerging categories. Then, we used an iterative inductive coding process (Glaser & Strauss, 1967), whereby each utterance was examined and eventually coded into one of the concepts that inductively emerged from the data. As new dimensions of the concepts arose, they were compared to previous material to eventually refine the concepts. These conceptualizations and categorizations form the core of the next section. We then examined the various concepts in greater depth to develop broader insights that are noted in the concluding discussion (e.g., the velocity of information flow, individualized information flora, and the quiddity of the crisis event).

Findings

“What’s Going on?”—Reactions to Receiving the Message

The first research question asks what factors led people to believe the missile alert “when they first received the information”? For most residents, the alert was first received directly through their smartphones. Some informants did not get the message directly because they were in an area

Table 1. Overview of the Respondents by Age Category.

| Age   | Gender | Educational level | Evaluation of the alert |
|-------|--------|-------------------|-------------------------|
|       | Male   | Female            | Some high school | High school degree | Some college | Assoc. degree | Bach. degree | Adv. degree | Real | Somewhere in-between | Not real |
| 18–30 | 32     | 27                | 0                  | 7                  | 28            | 0            | 20          | 6          | 17   | 26               | 18        |
| 31–40 | 51     | 82                | 2                  | 16                 | 32            | 12           | 36          | 33         | 41   | 63               | 30        |
| 41–50 | 33     | 60                | 1                  | 13                 | 20            | 10           | 26          | 22         | 25   | 48               | 21        |
| 51–60 | 51     | 45                | 1                  | 8                  | 30            | 10           | 22          | 24         | 27   | 33               | 36        |
| 61–70 | 10     | 12                | 0                  | 1                  | 2             | 0            | 6           | 12         | 6    | 9                | 7         |
| 71–80 | 4      | 2                 | 0                  | 2                  | 0             | 0            | 1           | 2          | 1    | 4                | 1         |
| Total | 181    | 228               | 4                  | 47                 | 112           | 32           | 111         | 99         | 117  | 183              | 113       |
without wireless coverage, were away from their phones (e.g., paddling in a canoe), had their phone in “airplane” mode, or they did not own a mobile phone. Aside from these few cases, informants mostly described the process of coming to terms with the alert through mobile media.

The material in the questionnaire shows that 28% of the respondents said their initial response was to believe the alert. Another 45% were unsure, and 27% said that they did not believe it. That is, about one-quarter of the sample did not believe what appeared to be an official and urgent message from authorities, and slightly less than half were unsure. Interestingly, the people who reported being unsure were more likely to check the information by, for example, searching through social media. Half of this group checked other sources, while only 26% of the group who thought it was real and 23% of the group who thought it was not real reported checking other sources.

The qualitative material shows that in some cases people simply ignored the message, as seen in the case of the 18- to 30-year-old male, who said that he “looked at my phone and went back to sleep.” In other cases, the first steps in legitimating the event came when the informants started to think through the content of the message:

I was going to sleep in a little longer [. . .]. I heard the noise on my phone for what I thought was a flash flood warning so instead of grabbing my phone, I rolled over and ignored it but then realized it was perfectly sunny and dry outside which is when I decided to grab my phone and look at the alert. I think I read the sentence “this is not a drill” 5 times until I went into full panic mode. I ran downstairs [. . .] crying and hyperventilating. (Female, 18–30 years)

In other cases, it was the alert along with the reaction of others that caused worry:

I was in the bathroom, getting ready to go to work. The alarm came on and I hesitated after reading it. I reread it and flung open the bathroom door. As soon as I stepped out of the bathroom my older sister came bolting out of her bedroom. I looked at her, “What’s going on?! Where’s mom?!?” (Male, 18–30 years)

An 18- to 30-year-old male who was getting his car serviced said,

I initially thought that it was a test. However, the last sentence of the alert read “THIS IS NOT A DRILL.” I began to look at the strangers around me and realized that they all started to panic. I immediately called my auntie who lives on Waialae and asked if she got the message. She said she would come and pick me up and we would go to our other relatives’ house.

These comments indicate that some people either used an abbreviated verification and/or following the suggestion from Milgram et al. (1969) took the cue from others nearby when accepting or denying the validity of the alert. If this had been a true alert, the findings indicate that authorities need to carefully consider how to avoid panic while also ensuring that the message is believed. These comments indicate that the message created openings for skepticism as well as mass confusion.

**Confirmation Activities**

The second research question examines how people verified the mobile alert. Upon receiving the alert, many informants started a confirmation process. Among those who thought the alert was real, 30% did not check another source. Also, 34% of those who did not believe the alert to be real did not check another source. That is, about a third of both groups relied on only the text message to decide. Among those who were unsure, far fewer (only 20%) did not check another source. Thus, a significant number of people reacted to the alert by either accepting or rejecting it without troubling to verify their decision.

“I Did Not Take It Seriously”—Internal Verification

Scholarly literature reports that when corroborating emergency messages, people draw from their internal sense of consistency (Cantril, 1940; Vihalemm et al., 2012). In the case of the false missile alert, comments show that some of the informants used their inner compass to judge the validity of the alert. Some considered whether the political situation between North Korea and the United States was so precarious that there would—or even could—be a missile attack. For example, “I did not take it seriously. I don’t believe North Korea has the technology to hit Hawaii with a ballistic missile with any accuracy at this point in time, let alone being dumb enough to attempt such a thing” (Male, 61–70 years)

“It’s on TV Now”—Visiting Formal Information Sites

Most respondents (73%) reported either immediately or eventually checking the alert against other information sources. Informants checked a variety of media channels, including broadcast TV, radio stations, and online legacy news sources, for example, CNN, as well as official online sites, including through their social media channels. In most cases, informants said that they were not able to confirm the alert through TV or radio. Informants said there was only normal programming, suggesting it was a false alert. However, occasionally, informants noted that a local TV broadcast served to confirm the mobile-based text messages since the alert also mistakenly had been sent to some local TV stations. For example, a 41- to 50-year-old woman said, “My husband got the message first and just looked up to me...
and didn’t say a thing. Then I got it . . . tried to find other info. I said, ‘it’s on TV now, not a drill, this is real’.”

As noted earlier, 45% of the respondents were not immediately sure of the validity of the message. This “unsure” group needed to somehow confirm or deny the validity of the alert. Among this “unsure” group, slightly more than a third (15% of the total sample) said that TV and radio were their main verification source, 29% (13% of the total sample) said online news websites, and 13% (6% of the total sample) said social media, specifically mentioning Facebook and Twitter. The remaining 25% (11% of the total sample) included people who reported calling public service offices, for example, civil defense, government offices, police stations, and so on, for verification, often encountering busy signals or a lack of response from overloaded civil servants, which led some to consider a non-response as verification of validity. Thus, formal information sites (broadcast media and authoritative websites) were a core source of information but also not an exclusive means of understanding what was happening.

“Everyone Started Calling”—Interpersonal Verification

In the mobile-enabled world of the informants, many noted that they had called close family and friends to check on the validity of the missile alert. Echoing the work on social validation (Milgram et al., 1969), these had the effect of validating the individual’s sense of the situation. The calls—which were often a mixture of information, plus sharing and expressive interaction—served to confirm the validity of the alert. Upon receiving the alert, for example, a 31- to 40-year-old woman noted, “I texted and called a few family members who were not with me to see what they thought if they thought the alert was real or not.” Another woman in the same age group said, “At first we didn’t think it was real until everyone started calling.” There was a bandwagon effect in these calls. A 61- to 70-year-old woman who was texting with her sisters said,

The words, “This is not a drill.” That it must not have been a prank since my husband and other family members received the same message. When my sister informed me that the clinic staff were being evacuated, the situation became more real for me and I started to cry.

In other cases, the interpersonal contacts had the opposite effect of dampening anxiety. This was the situation for a 41- to 50-year-old woman who said that she “Called parents to see if they got alert. But they were saying nothing was on TV, so they weren’t going to do anything.”

Other online interpersonal-verification venues were social networks. In some cases, the first notice of the alert came through screenshots, as in the case of this woman: “I actually did not get the warning on my phone. My boyfriend screen-shoted his warning sign on his phone to me” (Female, 18–30 years). Others said that they were quick to take a screenshot of the alert and post it to their social networking sites. “After I received the alert, I took a snapshot of the alert and posted it to Facebook” (Female, 51–60 years). This type of behavior, in effect, transformed the broadcast alert into social media and speeded its diffusion. It also added weight to the validity of the message and doubtlessly further fanned people’s anxiety, as in the case of the 31- to 40-year-old woman who reported receiving a screenshot of the alert from her husband. She noted,

I freaked out. [. . .] I frantically refreshed both devices every few seconds as I couldn’t find anything. I talked on the phone to my husband and felt like I was going to be physically sick from panic and fear.

Many of the comments emphasized interactions with the closest social sphere. This finding illuminates how people use their phones to reach out to this social sphere in times of stress (Vriens & van Ingen, 2018). Thus, the reaction to the situation was in some ways shaped by these moderated and emotionally infused interactions. The fact that the mobile phone now allows us to instantaneously reach out to this group of people means that this technology can have a hand in shaping our reaction to emergency events. This may—or may not—encourage an appropriate response.

“I Called My Wife Over and Over Again”—Verification by Chaos

As with earlier examples of widely broadcast or shared emergency events (Cantril, 1940), blocked telephone lines, and lack of information had the effect of confirming the validity of the emergency. For example, a 41- to 50-year-old male who noted that his first concern was his family said, “I called my wife over and over again until I could get through. It took me a long time because the calls kept being dropped . . .” These comments suggest that the surge in network activity served to indirectly amplify the validity of the alert.

“I Crawled and Waited Under a Table”—Checking Multiple Sources

In our heavily mediated world, one striking dimension of the informants’ comments was their use of multiple verification sources. People reported using their mobile phones, laptops, television, and radio in different combinations. This is seen in the emotionally collected comments of a 31- to 40-year-old woman:

As soon as I received the message of the missile-alert, I paused for about 10 seconds to see if I was going to receive a subsequent message. Then, I asked everyone else in the family if they received the same message since we all are on the same family plan [all] but only 1 of the devices did not receive it. Then, I
proceeded outside to listen for an alert and waited, walked around outside looking up in the sky to see if there was some activity. After waiting around for 5 minutes, I heard no siren. Went back in the house and turned on the TV to see any broadcasting of the missile but nothing. I turned on the radio and heard nothing. All programs were ongoing as normal. [...] I was more concerned about my car appointment if it was still on, so I called the shop . . . . (Female, 31–40 years)

This woman was roused by the alarm. However, she reported methodically checking different information channels to either verify or falsify the alarm. When her fears were not confirmed, she returned to her normal daily routines. This type of multi-channel verification was a common theme. Slightly more than half of the respondents who used other verification sources said that their primary source was TV or radio. Almost 38% said that they used online sources. Those who were away from their homes commonly reported using their smartphones:

I was in a conference, I crawled and waited under a table in the conference room with my wife, like everyone else was doing. While there, my wife and I were searching websites on our smartphones to determine the validity of the alert. (Male, 41–50 years)

Another resource that informants noted was information directly from various official sources, sometimes through personal ties. For example, this 41- to 50-year-old woman said,

We were in shock. Luckily, we have family in HPD [Hawaii Police Department] we were able to listen to the dispatch radio. There was a lot of confusion for the first 5 minutes. Then someone came on the radio and said it was a drill. That person said the(y) just got a notice from Emergency management, but they were instructed to not make notice to the public. We texted and called everyone we knew to let them know. (Female, 41–50 years)

Another woman (31- to 40-year-old) noted that “Our HPD [Hawaii Police Department] friends also posted on Instagram and Facebook to let their friends know it was ‘a Drill’.” She, in turn, contacted family and friends to pass on this information.

Interestingly, in this era of high-speed digital connections, there were many people who noted the lack of audible sirens. Indeed, about four in 10 of the informants mentioned listening for sirens.7

Looking across all the confirmation strategies, the material shows that people used a variety of methods to confirm or reject the alert. The brevity of the message prompted people to use other sources, both public and interpersonal, in the process of information gathering and confirmation. Following the process discussed by Wood et al. (2018) allowed them to personalize the situation and decide on their line of action. In some cases, people were quick to make decisions and perhaps panic. In other cases, when people checked different sources and were unsure, there was what Blumer (1939) called “milling.” Thus, the palpability of the social context along with the brevity of the actual message did not seem to do an adequate job of guiding the public.

**Expressive Interaction**

The final research question asked how people used their mobile devices for expressive interactions. Indeed, this is some of the most gripping material from the survey. The material points to how crises can play into the social cohesion of the group (Collins, 2004). The degree to which the desire to be in contact with their closest social sphere could, in some instances, cloud the most effective response to the alert.

“I Dropped Everything and Jumped in My Truck”—Pragmatic, in the Moment, Definition of the Intimate Sphere. Perhaps, the most powerful theme in the material was the strong desire to reach out to close family. This can be seen in the comments of this 41- to 50-year-old woman:

I used my smartphone to call my daughter who lives on the island of Oahu unsuccessfully for the first 4 calls because she was asleep and didn’t hear the alert. At the same time, I was calling her boyfriend with no luck because he was at baseball practice on Oahu. I called my son who was at work at the time and he received the alert and at the moment was in a safe place. I called my sister who was at home with my 2 little nieces and she has received the alert and was hidden in the hallway of her house trying to find a safe area. I called my parents who had received the alert and were at a grocery store along with other people panicked and trying to figure out what items they may need if this wasn’t a test and was real.

This woman, who was driving with her husband when the alert came, illustrates how she prioritized her core family. Aside from her daughter’s boyfriend (who was perhaps an indirect link to her daughter), all the activity was directed toward family. The survey data show that approximately 70% of calls were to close family (i.e., partner, children, parents, and siblings). Another 31- to 40-year-old man noted, “I dropped everything and jumped in my truck and raced to be with [my ex-wife and kids] knowing I probably only had about 10 minutes at that point. I made it to their house in 8 minutes” (Male, 31–40 years). This reflects the findings of Ling et al. (2018) that in emergencies, calls go to the strongest ties. Indeed, this is one of the strongest themes arising from the material; the desire to reach loved ones.

“You Were a Great Dad”—Articulating Relationships. Given the existential nature of the alert, the material shows that people wanted to tell their feeling to loved ones. A 31- to 40-year-old man noted, “A moment like this provides clarity.” The infor-
ments of the woman noted earlier who drove to be with her boyfriend. Other respondents reported driving at high speed, ignoring traffic lights, and the like, to be together with loved ones. For example, a 31- to 40-year-old woman noted,

I remember being mad that my husband was driving the speed limit and stopping at stoplights. I told him to floor it, (not) stop at red lights, and continue on if nobody was coming, so that’s what he did.

The comments illuminate the primacy of the closest social sphere. They also point to how the veneer of social rules, for example, speed limits and traffic lights, lost their position in the chaotic period of the missile alert. The broader social contract was, in that extreme situation, at least to some degree, put into abeyance in favor of the closest social sphere. It is important to note that the missile alert not only provided information (albeit incorrectly) but for some, it tapped into a fundamental urge to be together with loved ones. Indeed, this is one of the unintended consequences of this type of alert system that bears further investigation.

**Concluding Discussion**

Several broader issues that arose from the analysis. The speed with which information flowed during the alert is one issue. Another is that the direct personal nature of the interaction during the event focused attention on the importance of personal ties. It underscored how the strength of these ties can, in some cases, interfere with the business of alerting the public.

**The Velocity of Information Flow in Digital-Era Disasters and the Difficulty of Fact-Checking**

The speed of the information flow in a compressed time-frame was an important characteristic of the false missile alert. Digital life has changed this dramatically (Figley & Jones, 2008; Palen et al., 2009; see also, Vieweg et al., 2008) when compared with “pre-digital” disasters (Erikson, 1976).

The alert in Hawaii came unannounced, through a direct, simultaneous, population-wide alert, directly to each individual through their personal smartphones. In some cases, the information was rebroadcast using screenshots and messages by individuals to their social-networking ties. Different bits of information came from family and friends, messages through social media, screenshots of the alert, and information (and lack of information) through broadcast media, radio, websites, and so on. In some cases, this flood of information weighed in the direction of confirming the alert, and in other cases, against it. The empirical material gives us a mosaic of people piecing together and sharing the information that they had at hand. People were left with the task of working out the meaning of this diverse flow of information. As a result, critical thinking was not always easy to accomplish (Palen et al., 2009).
Thus, in a very short time frame, people had received a blast of rather sparse information. Some undertook a seemingly calm vetting of the information. For others, the information was layered onto a range of emotions, intense efforts to reach out to close ties, and efforts to seek shelter (Bean et al., 2015). All of this was compressed into the 38 frantic minutes of the actual event.

Much of the communication and information sharing was focused on the fundamental urge to make sense of a disaster (Palen et al., 2010). In this case, this was difficult given the disparate trajectories of the various information sources.

According to Bruns et al. (2012), information technology facilitates an emergent crowd-sourced “collective intelligence” (Bruns et al., 2012; Palen et al., 2010; Shklovski et al., 2010; Sutton et al., 2014). These social processes, however, require time and are perhaps easiest to accomplish in disasters that unfold over longer time spans, for example, hurricanes, floods, and wildfires (Berren et al., 1980; Weick, 1988). In the case of the missile alert, the simple speed and abruptness of the information, the breadth of the eventual impact, the existential intensity of the consequences, and the welter of information, made it difficult for the collective intelligence to establish itself. In sum, the hectic situation meant that some people delayed protective action until they reached the one person that they deemed most emotionally important. These considerations augur against the efficacy of the mobile alert system.

The Social Quiddity of Crisis Events and Their Effects on Interpersonal Cohesion

Another theme is that the false missile alert was a stark emotional event. It put peoples’ relationships with their family and friends into existential terms. The intensity of the need to contact one another for what could be the last time was clearly important to the informants.

For many, the central task during the event was to connect with their closest sphere as they tried to work out the dimensions and the nature of the situation. Indeed, the urge to call loved ones interfered with the practical need to shelter and evacuate. Informants describe putting aside everyday decorum in favor of expressing direct endearing assertions. In some cases, the interlocutors were co-present. However, since the mobile phone allowed informants to call loved ones who were not nearby, many of the comments described how people used the device to connect with these important ties.

Such dramatic moments, both face-to-face and in mediated form, produce a cohesion based on an indelible shared emotional experience (Collins, 2004). The memory of the event can become crystallized into a part of the relationship’s legacy. The urge to contact loved ones, and to express feelings show how, for some, the event stripped away pretense and illuminated the core of the relationship. The normal courtesies and social stratagems were dropped in the name of expediency. Exchanges were focused on mutual recognition of their bond. In normal life, these feelings and these declarations are most often more carefully contextualized, packed in, and apportioned. However, in what these people saw as an existential situation, they used what they thought was their remaining time to reach out and to concretize their relationship with their loved ones. In some cases, this rendering came at a critical point in the relationship:

We were currently facing some family issues, but it became minor in light of the warning we received. We decided it “could be it,” so we opened some whiskey we had saved for our anniversary and enjoyed a glass while talking about good memories. When we got the “all clear” we shook our heads in disbelief then proceeded to finish the bottle. (Male, 31–40 years)

In other cases, the event brought into focus missed opportunities for the informants. For example,

I feel tremendous guilt that I did not try to have my atheist son accept Jesus at what I thought were our last moments. I really feel that I failed a test as a mother and a Christian. Every time I think about it, I cry. (Female, 51–60 years)

Importantly, these emotional declarations did not disappear after the “all clear.” Indeed, they became a part of the relationship’s ballast. Thus, the false missile alert will play a role in the future lives of these people. The actual event lasted 38 minutes. However, from a psychological-trauma theory perspective (Houston et al., 2018) as well as a social cohesion perspective (Collins, 2004), the informants’ exchange of caring (and perhaps uncaring) feelings during that stressful event will be remembered, and will become part of the group’s legacy; a part of the way that they define themselves. It will have what can be called a social quiddity. As the individuals’ common reactions to the event are retold, and burnished, with time the stories take their place in the definition of the group. They become a way through which the individuals mark their bonds toward one another (Collins, 2004).

Issues Clouding the Clarity of the Alert

At the broadest functional level, one can ask whether the mobile alert in Hawaii was effective in delivering the alert as intended, regardless of its eventual lack of validity. In other words, what can be learned from the event that can be used to improve the system?

Confirming the theoretical work of Quinn et al. (2013), people worked to validate the alert. For many, the phone-based message, in itself, was not adequate. Those who were skeptical to the alert were quick to seek out verification through a variety of other information channels. For those who believed the alert at the point of departure, there was also the often-incorrect attribution of validity to, for example, the reactions of others, including on social media, and, for another example, the inability to complete calls due to
high traffic on the telephone network. These findings suggest that the mobile phone-based alert alone is not adequate. Reactions of informants show that information through several channels would both serve to validate the mobile-based message and draw attention away from false sources.

The other striking finding here is that, for some, the existential nature of the message brought strong emotions to the surface. The comments of the respondents show how the alert unleashed deeply held sentiments. The respondents felt the need to act on these feelings, for example, the need to be together with their closest family and friends. These feelings could cloud and color information about the situation, distract them from other official information, and lead them to dangerous actions, such as hazardous driving.

Limitations and Future Research
As with any research, there are limitations to the work. First, this analysis is limited to the sample of people who participated in the survey. Given the rapidly emergent situation, it was not possible to do a careful random sampling of the population. Furthermore, there are many untouched lines of research present. Again, because of the need to quickly get the instrument into the field, after a sudden and surprising event, there was not adequate time to reflect on many possible research questions. Even though we were able to quickly gather the data, there are likely issues of respondent recall and social desirability in that people were perhaps not prone to admitting that they had been tricked by the alert.

Future research in Hawaii can eventually examine the degree to which the false alert has degraded the legitimacy of the general emergency alert system. It also could address and examine other lasting effects, across a wide range of disciplines. The research here poses a question that does not fully get answered, in terms of which alert avenues (e.g., mobile-based with supplements through broadcast or online) are optimal and would result in the most appropriate reactions by the recipients. Longer-term, we could study how the experience of going through this alert has shaped the relationships of people in Hawaii. In other words, what are the long-term effects of the alert at the interpersonal or small-group level? These sorts of localized issues will have to be sorted out, over time, but with the expansion of Wireless Emergency Alerts nationally and around the world, what we can learn from this event about such mobile messaging may have dramatic consequences, especially with the growing consolidation and amplification of power in the people who can push the button.

Declaration of Conflicting Interests
The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding
The author(s) received no financial support for the research, authorship, and/or publication of this article.

ORCID iDs
Rich Ling https://orcid.org/0000-0002-6336-4050
Brett Oppegaard https://orcid.org/0000-0002-5778-1464

Notes
1. The timeline of the events is available at the state Department of Defense website: https://goo.gl/8Vs4gv.
2. Hyperlink to FEMA website: https://goo.gl/QZQ27t.
3. Hyperlink to the state Department of Defense report: https://goo.gl/Ct9zqa.
4. In some cases, it was clear from the metadata provided by Qualtrics that the individual was not in Hawaii at the time of the missile event (about 29% of the respondents). In other cases, the respondents noted only gibberish in the open questions. These were dropped from the analysis.
5. http://worldpopulationreview.com/states/hawaii-population/
6. There was a slight tendency for men to not believe the alert, F(1,406) = 3.439, p = .064.
7. There was a weak, but significant (albeit non-generalizable) correlation (.208, p < .01) between educational level and the number of sources checked.

References
Bean, H., Liu, B. F., Madden, S., Sutton, J., Wood, M. M., & Mileti, D. S. (2016). Disaster warnings in your pocket: How audiences interpret mobile alerts for an unfamiliar hazard. Journal of Contingencies and Crisis Management, 24(3), 136–147.
Bean, H., Sutton, J., Liu, B. F., Madden, S., Wood, M. M., & Mileti, D. S. (2015). The study of mobile public warning messages: A research review and agenda. Review of Communication, 15(1), 60–80.
Berren, M. R., Beigel, A., & Ghertner, S. (1980). A typology for the classification of disasters. Community Mental Health Journal, 16(2), 103–111.
Blumer, H. (1939). Collective behavior. In R. E. Park (Ed.), An outline of the principles of sociology (pp. 219–280). Barnes & Noble.
Brown, R., & Kulik, J. (1977). Flashbulb memories. Cognition, 5(1), 73–99.
Bruns, A., Burgess, J. E., Crawford, K., & Shaw, F. (2012). #qldfloods and @QPSMedia: Crisis communication on Twitter in the 2011 South East Queensland floods. ARC Centre of Excellence for Creative Industries and Innovation, Queensland University of Technology.
Cantril, H. (1940). The invasion from Mars: A study in the psychology of panic. Princeton University Press.
Clarke, L. (2002). Panic: Myth or reality? Contexts, 1(3), 21–26.
Cohen, A. A., & Lemish, D. (2005). When bombs go off the mobiles: Rituals of solidarity and security in the wake of terrorist attack. Sociological Theory, 22(1), 53–87.
Conway, M. (2013). Flashbulb memories. Psychology Press.
Correa, T., Scherman, A., & Arriagada, A. (2016). Audiences and disasters: Analyses of media diaries before and after an earthquake and a massive fire. Journal of Communication, 66(4), 519–541.
DeYoung, S. E., Sutton, J. N., Farmer, A. K., Neal, D., & Nichols, K. A. (2019). “Death was not in the agenda for the day”: Emotions, behavioral reactions, and perceptions in response to the 2018 Hawaii Wireless Emergency Alert. *International Journal of Disaster Risk Reduction, 36*, 101078.

Drabek, T. E. (1969). Social processes in disaster: Family evacuation. *Social Problems, 16*(3), 336–349.

Drabek, T. E., & Stephenson, J. S., III. (1971). When disaster strikes. *Journal of Applied Social Psychology, 1*(2), 187–203.

Durkheim, E. (1995). *The elementary forms of religious life*. The Free Press.

Dutton, W., & Naiona, F. (2003). The social dynamics of wireless on September 11: Reconfiguring access. In A. M. Noll (Ed.), *Crisis communication* (pp. 69–82). Rowman & Littlefield.

Erikson, K. T. (1976). *Everything in its path*. Simon & Schuster.

Figley, C. R., & Jones, R. (2008). The 2007 Virginia Tech shootings: Myths of panic. *Professional Safety, 57*(8), 42–49.

Glasier, B., & Strauss, A. (1967). *The discovery of grounded theory*. Aldine.

Goffman, E. (1967). *Interaction ritual: Essays on face-to-face behavior*. Pantheon Books.

Gow, G. A., McGee, T., Townsend, D., Anderson, P., & Varnhagen, S. (2009). Communication technology, emergency alerts, and campus safety. *IEEE Technology and Society Magazine, 28*(2), 34–41.

Gow, G. A., & Waidyanatha, N. (2009). Mobile phones and the challenge of sustainable early warning systems: Reflections on HazInfo Sri Lanka and opportunities for future research. LIRNEAsia.

Gutteling, J. M., Terpstra, T., & Kerstholt, J. H. (2018). Citizens’ adaptive or avoiding behavioral response to an emergency message on their mobile phone. *Journal of Risk Research, 21*(12), 1579–1591.

Houston, J. B., Spialek, M. L., & First, J. (2018). Disaster media effects: A systematic review and synthesis based on the differential susceptibility to media effects model. *Journal of Communication, 68*(4), 734–757.

Katz, J. E., & Rice, R. E. (2002). The telephone as an instrument of faith, hope, terror and redemption: America, 9-11. *Prometheus, 20*(3), 247–253.

Ling, R., Palen, L., Sundsday, P. R., Canright, G., Bjelland, J., & Engo-Monsen, K. (2018). Safety, sensemaking & solidarity: Mobile communication in the immediate aftermath of the 22 July 2011 Oslo Bombing. In J. A. Bell & J. C. Kuipers (Eds.), *Linguistic and material intimacies of mobile phones* (pp. 169–189). Duke University Press.

McFarlane, A. C., & Norris, F. (2006). Definitions and concepts in disaster research. In F. H. Norris, S. Galea, M. J. Friedman, & P. J. Watson (Eds.), *Methods for disaster mental health research* (pp. 3–19). Guilford Press.

McGee, T. K., & Gow, G. A. (2012). Potential responses by on-campus university students to a university emergency alert. *Journal of Risk Research, 15*(6), 693–710.

Mileti, D. S. (1999). *Disasters by design: A reassessment of natural hazards in the United States*. Washington, DC: The National Academies Press. http://books.google.com/books?hl=en&lr=&id=bkNPihhK1fgC&oi=fnd&pg=PR1&dq=Disasters+by+Design:+A+reassessment+of+natural++and+evacuations+in+the+United+States&ots=kQVIEGeAqg&sig=ZEJEhRPYSWoCBZxNSJtGFhRvo

Milgram, S., Bickman, L., & Berkowitz, L. (1969). Note on the drawing power of crowds of different size. *Journal of Personality and Social Psychology, 13*(2), 79–82.

Mitchell, H., Johnson, J., & LaForce, S. (2010). The human side of regulation: Emergency alerts. In *Proceedings of the 8th international conference on advances in mobile computing and multimedia* (pp. 180–187). https://dl.acm.org/doi/abs/10.1145/1971519.1971551?download=true

Monahan, B., & Ettinger, M. (2018). News media and disasters: Navigating old challenges and new opportunities in the digital age. In H. Rodriguez, W. Donner, & J. E. Trainor (Eds.), *Handbook of disaster research* (pp. 479–495). Springer. https://doi.org/10.1007/978-3-319-63254-4_23

Palen, L., Vieweg, S., & Anderson, K. M. (2010). Supporting “everyday analysts” in safety- and time-critical situations. *The Information Society, 27*(1), 52–62.

Palen, L., Vieweg, S., Lui, S., & Hughes, A. (2009). Crisis in a networked world: Features of computer-mediated communication in the April 16, 2007 Virginia Tech event. *Social Science Computer Review, 27*, 467–480.

Quarantelli, E. L. (1988). Disaster crisis management: A summary of research findings. *Journal of Management Studies, 25*(4), 373–385.

Quinn, S. C., Parmer, J., Freimuth, V. S., Hilyard, K. M., Musa, D., & Kim, K. H. (2013). Exploring communication, trust in government, and vaccination intention later in the 2009 H1N1 pandemic: Results of a national survey. *Biosecurity and Bioterrorism: Biodefense Strategy, Practice, and Science, 11*(2), 96–106.

Shkolovski, I., Burke, M., Kiesler, S., & Kraut, R. (2010). Technology adoption and use in the aftermath of hurricane Katrina in New Orleans. *American Behavioral Scientist, 53*(8), 1228–1246.

Slovic, P., Finucane, M. L., Peters, E., & MacGregor, D. G. (2007). The affect heuristic. *European Journal of Operational Research, 177*(3), 1333–1352.

Sorensen, J. H., & Sorensen, B. V. (2007). Community processes: Warning and evacuation. In *Handbook of disaster research* (pp. 183–199). https://link.springer.com/chapter/10.1007/978-0-387-32353-4_11

Sutton, J., Spiro, E. S., Johnson, B., Fitzhugh, S., Gibson, B., & Butts, C. T. (2014). Warning tweets: Serial transmission of messages during the warning phase of a disaster event. *Information, Communication & Society, 17*(6), 765–787.

Vieweg, S., Palen, L., Liu, S. B., Hughes, A. L., & Sutton, J. N. (2008). Collective intelligence in disaster: Examination of the phenomenon in the aftermath of the 2007 Virginia Tech shooting. University of Colorado.

Vihalemm, T., Kiesel, M., & Harro-Loit, H. (2012). Citizens’ response patterns to warning messages. *Journal of Contingencies and Crisis Management, 20*(1), 13–25.

Vriens, E., & van Ingen, E. (2018). Does the rise of the Internet bring erosion of strong ties? Analyses of social media use and changes in core discussion networks. *New Media & Society, 20*(7), 2432–2449.

Weick, K. E. (1988). Enacted sensemaking in crisis situations. *Journal of Management Studies, 25*(4), 305–317.
Weick, K. E. (1993). The collapse of sensemaking in organizations: The Mann Gulch disaster. *Administrative Science Quarterly, 38*, 628–652.

Wong, D. J., Jones, E., & Rubin, G. J. (2018). Mobile text alerts are an effective way of communicating emergency information to adolescents: Results from focus groups with 12- to 18-year-olds. *Journal of Contingencies and Crisis Management, 26*(1), 183–192.

Wood, M. M., Mileti, D. S., Bean, H., Liu, B. F., Sutton, J., & Madden, S. (2018). Milling and public warnings. *Environment and Behavior, 50*(5), 535–566.

**Author Biographies**

Rich Ling (PhD, Nanyang Technological University, Singapore) is the Shaw Foundation Professor of Media Technology. For the past three decades, he has studied the social consequences of mobile communication. He has written *The mobile connection* (Morgan Kaufmann, 2004), *New Tech, New Ties* (MIT, 2008), and *Taken for grantedness* (MIT, 2012). He is the editor-in-chief of the *Journal of Computer-Mediated Communication* and is a founding co-editor of *Mobile Media and Communication* (Sage) and the Oxford University Press Series *Studies in Mobile Communication*. He is a fellow of the International Communication Association, Academia Europaea and Det Norske Videnskaps-Akademi (the Norwegian Academy of Arts and Letters).

Brett Oppegaard (PhD, University of Hawai‘i at Mānoa) is an associate professor. He studies intersections of Technical Communication, mobile technologies, and media accessibility. His research has been supported by US federal agencies—such as the National Endowment for the Humanities, the National Endowment for the Arts, and the National Park Service—but also by private foundations and corporations, such as Google.