

## Operant Subjectivity

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# Using Q Methodology to Identify Millennials' Media System Dependency During Mass Disruption Events

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**Abstract:** This research examined millennials' Media System Dependency (MSD) for response, mitigation and recovery during and after a mass disruption event (MDE). Q-statements examined traditional and social media preferences during MDEs for information sharing, information seeking, communication of emotion and opinions as well as coordination of action and assistance. Q-sorts took place following an earthquake in the region so researchers could study the actual preferences of millennials following a natural disaster. The use of Q-Methodology allowed for five MSD types to emerge among millennials, which will help researchers understand audience media selection and for what purposes media are used during MDEs.

**Keywords:** crisis communication, disaster communication, mass disruption events, media system dependency, Q methodology

## Introduction

Each year mass disruption events (MDEs) occur throughout the world, ultimately affecting millions of people, creating havoc and leaving inestimable destruction in their wake. To help aid in awareness and survival, it is increasingly important to examine and understand individuals' preferences regarding traditional and social media use during MDEs. MDEs were defined by Starbird, Muzny and Palen (2012) as, "event[s] affecting a large number of people that causes disruption to normal social routines" (p. 2). Possible sources of MDEs include extreme weather, natural disasters, political protests, terrorist acts, etc. MDEs contain what Loges (1994) described as the three levels of threat: "conjecture (uncertain probabilities), danger (exposure to loss or harm), and personal vulnerability (perceived harm to self or close others)" (p. 9). Thus, in order to cope and make sense during MDEs, individuals actively seek out accurate, reputable information (Sutton, 2012). This information search often involves both news media and interpersonal communication, as immediate community needs must be met (Dynes & Quarantelli, 1968; Wachtendorf & Kendra, 2005). Computer-mediated communication via Internet, more specifically social media, has recently been an important part of MDE information searches.

Lewis (2010) defined social media as computer-mediated communication technologies allowing individuals to connect, produce and share content. Social media technologies include blogs, forums, microblogging (e.g., Twitter), social networking sites (e.g., Facebook) and wikis (Osatuyi, 2012; Osatuyi, 2013). Social media have been

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envisioned as an inexpensive and efficient way for individuals to become aware of MDEs, distribute information, crowd-source information and support recovery (Sutton, 2012). Recent research suggests individuals coping with MDEs (specifically those directly affected by the event) prefer social media over traditional media for up-to-date, relevant information (Shklovski, Burke, Kiesler & Kraut, 2008). Thus, some researchers suggest that during MDEs the one-way communication model used by traditional mass media has given way to multi-way models allowed by social media (Heverin & Zach, 2012).

Quarantelli (1987) posited most disaster research indicates that during MDEs individuals do not receive the information they want. Media system dependency (MSD), a theory of media power to attain individual goals, suggests ambiguous situations and times of crisis such as MDEs “results in people becoming increasingly dependent on the media for information to resolve those ambiguities” (Ball-Rokeach, 1998; Hirschburg, Dillman & Ball-Rokeach, 1986; Lee, 2012, p. 459). Much of the previous research in media use and information seeking/sharing during MDEs has examined the nature of the communications. This study, however, focuses on the media system preference of audience members during MDEs, specifically, millennials’ use of communication in response, mitigation and recovery during and after an earthquake in Virginia. The two latter areas (i.e., mitigation and recovery) were noted by Quarantelli (1987) as lacking in studies of mass communication.

Millennials are individuals born from 1982 to 2001 who have grown up utilizing computer-mediated communication technologies for entertainment, surveillance and multi-tasking (Howe, Strauss & Matson, 2000; Junco, Mastrodicasa, & Upcraft, 2007). Vincent and Basil (1997) investigated uses and gratifications (U&G) theory among college students in relation to media and surveillance and found with each additional year of college, media use and surveillance needs increased. Their study justified sampling college students because they were engaged in an important stage of socialization, and implied news media habits developed during college may influence later usage of media throughout their lives (Henke, 1985). Recent research by PEW indicates the following in terms of millennial social media use: 87% use Facebook, 37% use Twitter, 53% use Instagram, 34% use Pinterest and 23% use LinkedIn. In addition, research suggests this wired generation is acutely socially conscious as activists, charity workers, organizers, volunteers and voters, thereby making millennials an interesting audience to study for disaster response (Greenberg, 2008; Burnstein, 2013; Saratovsky & Feldmann, 2013).

Using Q-Method, it is possible to segment audiences based on underlying attitudes, beliefs and usage strategies regarding preferences for traditional and social media used in information gathering and dissemination during an MDE. Specifically, this study evaluates whether millennials prefer to utilize social media (Facebook/MySpace, Twitter, texting and blogs) versus traditional media (radio, television, newspapers and magazines) in information gathering and dissemination during an MDE. This study is important as “we have very little knowledge of who listens or watches what...for what purposes during the emergency time periods of disasters” (Quarantelli, 1987, p. 25). Thus, this research helps identify millennials’ MSD types during MDEs.

## **Literature Review**

### **Media System Dependency**

Media System Dependency (MSD) theory posits individuals rely upon mass media to

satisfy goals (Ball-Rokeach, 1985; DeFleur & Ball-Rokeach, 1989). Media systems are information systems “necessary for development, maintenance, and change of modern societies” (Ball-Rokeach, 1998, p. 16) “central to the living of everyday personal and social life” (p.20). MSD makes a clear distinction between *media use* and *media dependency*, as previous media use informs individual perceptions of each media type and can predict later media dependency (Lowrey, 2004). However, Riffe, Lacy, and Varouhakis (2008) stated “dependency on a source or medium does not require exclusive use of that medium, nor even daily use, but regular use indicates whether the medium constitutes an important part of the individual’s information mix” (p. 1). The relationship between media systems and individuals is asymmetric as media systems control information distributed to individuals, while individuals find their personal goals met by different media; thus, MSD is a theory of media power and individual “problem-solving motivation” (Ball-Rokeach, 1985, p. 494; Ball-Rokeach, 1998; Ball-Rokeach, Rokeach & Grube, 1984). Usually, MSD studies examined traditional media (i.e., media’s ability to gather, create, process, disseminate), but recent research has begun examining new media platforms (Ball-Rokeach, 1985). Riffe, Lacy and Varouhakis (2008) suggested the “in-depth, specialized information” available from the Internet has influenced individual media dependency shifts away from traditional media (p. 12). Likewise, Lee (2012) stated social networking sites “may have changed the dependency relationship” by allowing individuals to produce, distribute and interact with information without mass media involvement (p. 460). We suggest social media use is part of interpersonal networks noted by Ball-Rokeach (1985) and communication focus changes in these networks alter MSD relations.

MSD further posits as personal goals are met, MSD increases, resulting in increases in attention and post-exposure communication, as well as changes in attitudes and behaviors (Ball-Rokeach, Rokeach & Grube, 1984; Lowrey, 2004). MSD differentiates itself from other goals theories, such as Uses and Gratifications (U&G), by suggesting the individual is a “problem solver” rather than a “content molder” in a media system controlling essential information (Ball-Rokeach, 1998, p. 26). MSD research focuses on individual goals of *orientation* (action and interaction), *play* (social and solitary) and *understanding* (social and self) (Ball-Rokeach, 1985; Ball-Rokeach, 1998; Hirshburg, Dillman & Ball-Rokeach, 1986; Loges, 1994; Loges & Ball-Rokeach, 1993; Morton & Duck, 2000). However, individuals with similar goals and social systems exhibit differing MSD tendencies based on (a) social environment, (b) media system activities, (c) interpersonal network activities and (d) individual characteristics (Ball-Rokeach, 1985, p. 499; Loges, 1994).

Thus, Micro-Media Systems Dependency theory focuses upon individual factors and how time and situation influence MSD (Ball-Rokeach, 1998). Micro-MSD examines individual-level factors influencing reliance upon media during time of MDEs, including demographics, media use patterns and goals, social context and threat perception (Lowrey, 2004). However, to a greater extent, MSD research examines how natural or social environments intensify media system dependency relations (Loges, 1994). “We expect that most individuals will experience heightened dependency on the media system’s information resources when salient aspects of their environs are ambiguous – insufficiently predictable or interpretable” (Ball-Rokeach, 1985, p. 500). Ball-Rokeach (1998) posited *problematic environs* such as MDEs change Micro-MSD relations as threat and ambiguity increase “motivational investment” in individual goals (p. 20). Information is “an essential resource for survival of the human species and its societies” (Ball-Rokeach, 1998, p. 16). This was supported by Loges (1994), who found threat

produced escalated desires for information and more intense media system dependency, and later work by Lowrey (2004), who found that during MDEs individuals used mass media for timely and adept information and to make sense of issues.

Consequently, a number of studies have examined Micro-MSD during MDEs, finding that mass media surpassed interpersonal communication during a volcano eruption (Hirschburg, Dillman & Ball-Rokeach, 1986), local radio use increased during a flood (Hindman & Coyle, 1999) and television and newspaper use increased (followed by interpersonal communication, radio and Web) during the Sept. 11 attacks (Lowrey, 2004). Research by Lowrey (2004) indicated level of threat and previous media use influenced MSD, as during MDEs individuals who experience high threat rely more heavily upon media they had previous experience with. Following MDEs, however, DeFleur and Ball-Rokeach (1989) suggest individuals may revert to normal media use.

### **Media Information Sharing Differences**

Recent research suggests social media are timely, effective sources of information that allow publics to make sense of the world around them (Zhang & Gao, 2014; Osatuyi, 2013). Moreover, social media require minimal time and effort for audience members to take part in information sharing (Osatuyi, 2013). In contrast, traditional media gatekeeping – processes journalists go through to verify, edit and substantiate information in stories – delays information sharing. Though this gatekeeping process is “truncated” during times of MDEs (Quarantelli, 1996), it still lags behind the immediacy of social media. Hart, Brewster and Shaw (2012) discuss the sluggish response times of traditional media during MDEs, as they must verify information accuracy and fight rumors.

Early work by Quarantelli (1996) on mass media coverage of MDEs indicates inconsistencies in depth and patterns of coverage and, in some cases, complete lack of disaster coverage. What coverage does exist relies upon traditional “beats” and the “command post model,” wherein official/emergency sources are used for stories, thereby marginalizing nontraditional sources (Quarantelli, 1996, p. 8). In addition, the command post view results in media accounts focusing on highly positive (usually organizational) or negative (usually individual) behaviors associated with the disaster and on what has been accomplished (instead of what needs to take place to alleviate problems) (Quarantelli, 1987; Quarantelli, 1999). Work by Watson (2014) on the BP oil spill found local journalists were more favorable toward BP in their coverage. Later work comparing news media coverage to Twitter responses found local journalists were more positive than journalists from larger metro areas but that local coverage did not differ significantly in tone from Twitter responses (Watson, 2015). This is another issue noted by Quarantelli (1987, 1999) as most MDE coverage is done by local mass media and not addressed by regional or national media. Thus, Watson (2015) suggests news media’s coverage is influenced by social and economic factors – factors that do not impede computer-mediated communication technologies (p. 5). Nevertheless, many individuals still rely upon the “live” in-depth coverage of television and radio, as well as the “post-impact” coverage of newspapers (Quarantelli, 1996).

Though seemingly displeased with mass media coverage of MDEs, Quarantelli (1997) posited in later work, “information overload and quickness of the message flow [from computer-mediated communication technologies]...does not necessarily lead in itself to a better exchange of knowledge and intelligence, and/or a greater understanding of what is occurring” (p. 101). Research suggests approximately 85% of journalists feel social media information is less credible due to lack of reporting standards (Cision &

Bates, 2009). However, the public — and in the case of MDEs, emergency responders — may be more concerned with “novel situational information” (i.e., information not able to be disseminated by traditional news) accessed on social media which provides marginalized accounts (Saleem, Xu & Ruths, 2014). In addition, during MDEs the public is “less amenable to the unified message conveyed by the traditional media” and more open to collective information sharing (Hart, Brewster & Shaw, 2012, p. 8).

This has led researchers to suggest social media information sharing is replacing traditional media (Hart, Brewster & Shaw, 2012; Osatuyi, 2013). Hermida (2010) posits social media allow for “ambient journalism,” wherein individuals add to the collective narrative about events by connecting with and responding to traditional news. Other research suggests social media should be combined with traditional media to “push messages” during MDEs to provide greater additional or more detailed information (Hart, Brewster & Shaw, 2012). Chew and Eysenbach (2010) found this to be the case during the 2009 H1N1 outbreak, as Twitter not only pushed official source information to the public, but the public added their own experiences and opinions to the narrative.

### **Social Media During MDEs**

Early work by Quarantelli (1990) suggested that during MDEs:

Recipients of warning messages do not normally respond directly as individual persons; they react instead in the context of interaction with other people who may or may not be physically present or involved...Warnings delivered directly by other people are more likely to be believed than when communicated by an impersonal medium. The more personal the manner in which a message is delivered the more it will be given credence. (p. 4)

This directly informs current research in the area of social media during MDEs in the burgeoning area of “crisis informatics” (Hagar & Haythornthwaite, 2005; Palen et al., 2010; Starbird, Muzny & Palen, 2012 p. 2). Much of this research has been based on the idea of “digital convergence,” wherein individuals distantly and directly affected converge online during MDEs (Kendra & Wachtendorf, 2003; Hughes et al., 2008), allowing for sense-making, “sight-seeing” or “disaster pilgrimage” (Shaw, Burgess, Crawford, & Bruns, 2013, p. 35). This research shows that during MDEs social media aid in victims seeking family members (Shklovski, Burke, Kiesler & Kraut, 2008), individuals requesting community support (Vieweg, Hughes, Starbird & Palen, 2010) and rebuilding sense of belonging (Qu, Huang, Zhang & Zhang, 2011; Starbird & Palen, 2012). The areas of response, mitigation and recovery are deemed essential periods for mass communication (Quarantelli, 1987). Based on this research and their own examining of the 2008 Sichuan earthquake, Qu, Wu and Wang (2009) developed a typology of primary categories for social media MDE messages, which consisted of action, information, emotion and opinion.

**Information Sharing.** Recent research posits social media allow users to share, collect and synthesize information during MDEs, resulting in “collective intelligence” (Palen & Vieweg, 2008; Qu et al., 2009; Starbird et al., 2010). Osatuyi (2012, 2013) suggested information is either dynamic (i.e., generates dialogue) or static (i.e., information shared with no intent for dialogue). Acar and Muraki (2011) found most Twitter messages surrounding the Tokyo earthquake and tsunami were environmental reports (e.g., fires, sea level, explosions) and warnings (e.g., escape) which helped publics evacuate, find higher ground and survive during the aftermath. A seminal study by Heverin and Zach

(2012) examined three campus shootings and found microblogging helped in information sharing during the initial events and in opinion sharing immediately following. Their research suggested social media allowed for a “complete view of a constantly changing reality” that helped in sense-making (p. 36). Furthermore, the ability of users to purposively add hashtags to aid in information sharing/gathering was noted as aiding in “collective knowledge” (p. 42).

Information control or “information negotiation” (Heverin & Zach, 2012, p. 42) is also observed as studies suggest social media allow individuals to correct misrepresentations, dispel myths and assuage gossip (Sutton, 2010; Shaw, Burgess, Crawford & Bruns, 2013; Panagiotopoulos, Bigdeli & Sams, 2014; Starbird et al., 2014). Mendoza et al. (2010) found rumors about the Chilean earthquake in 2010 were dispelled by others in the social media community, thus aiding in collective intelligence. Additionally, Shaw, Burgess, Crawford and Bruns (2013) posit individuals make sense of MDEs by sharing personal experiences, placing events in context to other issues and linking to other historical narratives.

**Information Seeking.** Research also suggests social media allow users to check the status of friends/family, let people know about their own safety/issues and seek out information about damages (Shklovski, Burke, Kiesler & Kraut, 2008; Acar & Muraki, 2011; Qu et al., 2011). When information is sought, channels/users that step in to fill information needs are rewarded. Shaw, Burgess, Crawford and Bruns (2013) saw thanks and gratitude emerge in social media disaster content as authorities filled in information gaps. This appreciation, the authors suggested, was because content was produced specifically for user needs (i.e., user centered). The appreciation also filled a normative role as shows of gratitude indicated appropriate forms of participation in the social media MDE dialogue.

**Emotions and Opinions.** In the wake of MDEs, research has indicated communication of feelings aids in “talking cure” (Heverin & Zach, 2012, p. 43). This occurs without expectations of dialogue, but simply as a way to verbalize emotions. Heverin and Zach (2012) noted this type of message “does not add to the collective understanding of crisis ...Instead, the tweet provides the individual a method for voicing his or her inner thoughts and feelings” (p. 43). Emotional responses to situations range from grief and support (Palen & Liu, 2007; Hjorth & Kim, 2011) to anger, fear, hope, relief and shock (Heverin & Zach, 2012). In addition, many individuals seek the “why” of the MDE (Heverin & Zach, 2012) and may try to fill in this hole with their own opinions as to why bad things occur.

**Action and Assistance.** Work by Stallings and Quarantelli (1985) was among the first to suggest individuals, instead of or supplemental to those of response agencies, should act during MDEs. Later work by Quarantelli (1997) posited “groups” form during MDEs to organize disaster responses. Heverin and Zach (2012) suggest actions help individuals feel connected during MDEs. Research also indicates social media influence *situational awareness*, defined as a heightened state of knowledge wherein emergency management agencies need to assess conditions to know how, and where, to deploy services and supplies (Saleem, Xu & Ruths, 2014). Individuals seeking assistance are able to utilize social media to connect with those coordinating action (Vieweg et al., 2010; Sarcevic et al., 2012). Social media have been shown to help with self-organization efforts (Qu et al., 2009; Starbird & Palen, 2011), volunteer efforts (Starbird & Palen, 2011), clean-up efforts (Panagiotopoulos, Bigdeli & Sams, 2014) and seeking or offering assistance (Palen & Liu, 2007; Acar & Muraki, 2011; Qu et al., 2011; Starbird &

Palen, 2011; Mark et al., 2012).

### **MSD and Surveillance Types During MDEs**

As noted by Quarantelli (1987), "it would be very helpful if profiles were developed of mass media audiences during major community crises" (p. 25). This study seeks to address that continuing void. Research by Starbird, Palen, Hughes and Vieweg (2010) posits individuals fill various roles during MDEs, ranging from detection to information updates to recovery with each of these roles enabled or magnified by social media (Glasgow & Fink, 2013). Osatuyi (2012) suggests individuals differ in their social media use during MDEs based on the type of information shared (i.e., personal, sensational, political, casual), how they want the information consumed (i.e., dynamic vs. static) and who they share the information with. Shaw, Burgess, Crawford and Bruns (2013) suggest individuals take part in MDEs via social media through amplification, identifying errors and information sharing. Also, Glasgow and Fink (2013) identified behaviors as talking about, talking to or quoting. Each of these points to individual differences in MSD during MDEs. However, we cannot assume individuals use social media solely during MDEs; we therefore must simultaneously examine their traditional media use. Thus, our overall research question is, What MSD typologies exist in regard to millennials' social media and traditional media preferences during MDEs in terms of sharing information, seeking information, communicating emotions and opinions and organizing in terms of volunteering, donating, etc.?

### **Method**

The goal of the present study was to identify MSD among the millennial population based on media preferences during and following an MDE. In order to accomplish this, Q Methodology was utilized and took place immediately following an earthquake in Virginia. Originally developed by William Stephenson in 1935 (Brown, 1993), Q Methodology "allows for exploratory understandings of people's attitudes" (Singer et al., 1996). Q Method enables the researcher to measure subjective preferences by respondents' rank-ordering opinion statements (e.g., from those that are "most consistent with their viewpoint" to those that are "most inconsistent with their viewpoint") (McKeown & Thomas, 1988).

In addition to being present at the time of an MDE, this age group is in an important period of socialization to news media habits that may influence media usage later in life (Henke, 1985). It is therefore important to understand their subjective preferences regarding both media types during MDEs. Future disaster communication plans may be designed to reflect media preferences from emerging groups, ultimately allowing for MDE information to reach different groups more efficiently and with greater effectiveness.

### **P Sample**

A magnitude 5.8 earthquake occurred in Virginia on August 23, 2011. The quake was felt in more than a dozen states and was reportedly experienced by more people than any other quake in U.S. history (Ruane & Arantani, 2012). The week immediately following the quake, researchers recruited 117 undergraduate college students from two introductory journalism courses at a large, Mid-Atlantic university to take part in this study.<sup>1</sup> The courses consisted of students from a variety of disciplines also likely to

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<sup>1</sup> The earthquake was felt at the Mid-Atlantic university where the study took part.

have diverse backgrounds, which reduced the likelihood of recruiting individuals with similar beliefs and attitudes toward preferred media. Participants received extra credit for their participation in the study.

### **Q Sample**

Forty-two opinion statements were taken from extant literature, news accounts regarding social media usage during disaster/crisis communication and academic research on disaster/crisis communication during MDEs. The structured sample statements were structured to include the main themes of traditional and social media usage during natural disasters; 17 statements corresponded to social media in the form of Facebook/MySpace, Twitter, online blogs and text messages, while 25 statements corresponded to traditional media in the form of newspapers (print/online), television, radio and magazines. It is important to mention that because newspapers are increasingly offered online – sometimes exclusively – statements regarding newspapers included print and online. Since magazines are most often offered only monthly or weekly, statements were in “after the disaster” tense.

The statements were constructed by the researchers to reflect the extant literature; therefore, six sub-themes within the traditional and social media themes were included: information seeking, opinion sharing, technology commentary, emotion expression, action taking and uninformed/dispassionate/disinterested. The initial five sub-themes were based on findings by Heverin and Zach (2010). The sixth sub-theme was added to include people who may be disinterested, dispassionate or prefer to remain uninformed in regard to MDEs.

### **Q Sorting**

Participants took part in the sorting process at one of five sessions throughout one week. The Q sort pack was sorted into an 11-point scale, ranging from +5 (strongly agree) to -5 (strongly disagree). The number of statements sorted into each part of the scale was 2, 3, 4, 5, 6, 7, 6, 5, 4, 3, 2, creating a forced bell curve. At the end of the sorting process, participants were asked to comment on the statements they most and least agreed with. The qualitative data provided by college students during the open-ended comments provided rich information representative of their beliefs, allowing for the researcher to better understand their subjectivity. After sorting Q sample statements, participants were asked to create a code name that allowed for confidentiality while analyzing the data. Finally, participants were instructed to complete a questionnaire containing demographic and subject characteristics questions.

### **Data Analysis**

After all participants completed the Q sorting process and answered questions regarding demographics and subject characteristics, PQMethod was used to conduct Q factor analyses. Statement reporting errors caused the researcher to omit over 30 Q sorts, with the final analysis examining 87 participants' Q sorts (of these, only 53 loaded into factors described below).<sup>2</sup> The Centroid Analysis was adjusted to examine eight

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<sup>2</sup> Typical Q Method studies traditionally use fewer participants than used in this study. More sorts were collected as participants did not report statements correctly on the research forms. Misinterpretation and questionnaire errors hindered the results of demographic and subject characteristics; therefore, many of those results were not considered in the interpretation of the factor types.



maximum (the total PQMethod allows) factors; however, after Varimax rotation, only five factors included enough individuals to interpret (Brown, 1980). The five types accounted for 16, 10, 6, 7 and 10 percent of the explained variance, respectively (49% total). The five resulting factors were similar regarding participant demographics.

**Table 1**  
**Demographic information by factor**

	<i>Factor 1</i> <i>N=18</i>	<i>Factor 2</i> <i>N=11</i>	<i>Factor 3</i> <i>N=6</i>	<i>Factor 4</i> <i>N=6</i>	<i>Factor 5</i> <i>N=12</i>
<i>Gender</i>					
Male	4	4	3	3	4
Female	14	7	3	3	8
<i>Age</i>					
18-20	16	10	5	4	12
21-23	2	1	1	2	0
<i>Ethnicity</i>					
African-American	1	0	1	1	0
Asian	1	0	0	0	0
Caucasian	16	11	5	4	12
Middle Eastern	0	0	0	1	0
<i>Education</i>					
Freshman	10	6	3	0	7
Sophomore	5	3	2	4	4
Junior	2	2	1	1	1
Senior	1	0	0	1	0
<i>Major</i>					
Business	2	2	0	0	0
Communication	8	3	2	2	7
Education	0	0	0	0	0
Engineering	0	0	0	0	2
Science	2	2	1	3	0
Technology	2	0	0	0	0
Other	4	4	3	1	3

Interpretation of the five factors was completed by using the factor arrays from the Q sorts and individual comments made about the statements most and least agreed with in regard to preferred communication methods during natural disasters. Each type explained was assigned a label to give a general summary of the type's usage preferences regarding traditional and social media during MDEs. Types 1 through 5 were named Media Cognizant Utilitarians, Unbiased-Information Seekers, Apathetic Minimalists, Social Media Neophytes and Avid News-Gatherers and Contributors, respectively (see Appendix 1).

## Factor Interpretation

**Type 1 – Media Cognizant Utilitarians.** The first type, Media Cognizant Utilitarians, were adroit media consumers who recognized each media vehicle’s strengths and utilized each media efficiently during the MDE. Television remained their chief source for complete information; however, they were social media enthusiasts, which influenced them to join in the conversation by sharing feelings (+4,  $z=1.257$ ), views (+4,  $z=1.682$ ) and opinions (+4,  $z=1.314$ ) on social forums. They were continuous information-seekers who appreciated social media because it provided them with fast updates (-5,  $z=-2.003$ ). “Twitter is instant and constant. There are easy ways to keep up with info, like tags,” one participant stated. Another participant pointed out, “Facebook allows access to instant information, much faster than waiting on reporters.” Although social media performed a significant function in their natural disaster involvement, television reports supplied these individuals with access to complete coverage (+5,  $z=1.905$ ), as well as rich accounts of peoples’ emotional stories (+5,  $z=1.682$ ). “On television you can see/hear the people’s faces, voices and images of the disasters. TV reports can show it all,” asserted one participant. Another suggested, “Although social media is taking over media, I still believe the best and most believable news comes from television.” As self-aware individuals, Media Cognizant Utilitarians were sympathetic and cared about others affected by the MDE. Their compassionate disposition stimulated their desire to continuously seek and stay abreast of current information, even if the disaster did not directly affect their lives’ (-5,  $z=-2.179$ ). “I definitely am not apathetic toward natural disasters or anything else that affects many people – I’m very emotional,” said one participant. “Just because the disaster is not happening to me does not mean I don’t care about the information. I still would like to know what is happening,” another stated. (See Table 2.)

**Table 2**  
*Z-scores and Statements for Type 1 — Media Cognizant Utilitarians*

Statement Number	Statement	Z-score
6	I feel that I get the best natural disaster coverage from television reports.	1.905
27	I feel that during a natural disaster television allows me to best experience other peoples’ emotional stories.	1.682
11	I feel that Facebook/MySpace enable me to express my views about natural disasters.	1.384
9	I feel that the best way to express my opinions regarding natural disasters is to Tweet them on Twitter.	1.314
23	I feel that when I am nervous, scared or worried during a natural disaster Twitter allows me to share those feelings with others.	1.257
42	I don’t generally volunteer or donate following natural disasters.	-1.369
39	I don’t care to share my opinions regarding natural disasters with others.	-1.568
41	I don’t feel the need to express my emotions regarding natural disasters with others.	-1.753

Statement Number	Statement	Z-score
40	I just need the warning sirens to go off, after that I don't need fast updates or great links (e.g., videos, audio files, maps, photos) about natural disasters.	-2.003
38	I feel that when it comes to natural disasters, if it is not happening to me I don't care about getting information about it.	-2.179

\*Scores on this table do not include a full array. Instead only those 5 that the type had the most agreement with and those 5 that the type had the most disagreement with are listed

**Type 2 – Unbiased-Information Seekers.** The second type, Unbiased-Information Seekers, were traditional media advocates who preferred to only acquire information and did not care to share personal reactions concerning MDEs. These detailed-information seekers wanted credible information without biases or opinions – a key distinction for these individuals. Much like Media Cognizant Utilitarians, Unbiased-Information Seekers believed television delivers the best MDE coverage (+5,  $z=2.327$ ) and a rich account of peoples' emotional stories (+5, 1.808). Moreover, they believed television provided the latest, up-to-date information (+4,  $z=1.754$ ). "I feel that I get the best natural disaster coverage from television because the television is constantly updating itself," said one participant. These individuals also felt newspapers (online and traditional forms) provided the most detailed information (+4,  $z=1.746$ ). One participant noted, "Newspapers seem to go in-depth and post things quickly and vividly." Though they did not care to share information, Unbiased-Information Seekers were empathetic and wanted to gain information about MDEs even when it didn't affect them personally (-5,  $z=-1.662$ ). "I do care. I'm not selfish. I want to know what's going on," one participant emphasized. "I definitely want to know about a natural disaster even if it's not happening to me," another said. Social media sites were perceived as too laden with opinionated and biased information according to Unbiased-Information Seekers. "I disagree about getting information from Facebook/MySpace because I think you get a lot of rumors off of those sites," one participant argued. "[T]weeting can get a lot of people in trouble and false, biased information comes off of Twitter." Another added, "I feel that blogs are too opinionated to be news." Traditional media, specifically television and newspapers, were these individuals' chief sources to satisfy their disaster communication needs: comprehensive, fast and unbiased information. (See Table 3.)

**Table 3**  
*Z-scores and Statements for Type 2 — Unbiased-Information Seekers*

Statement Number	Statement	Z-score
6	I feel that I get the best natural disaster coverage from television reports.	2.327
27	I feel that during a natural disaster television allows me to best experience other peoples' emotional stories.	1.808
19	I feel that television seems to be the only place to get fast updates and great links (e.g., videos, audio files, maps, photos) on natural disasters.	1.754

Statement Number	Statement	Z-score
5	I feel that traditional and online newspapers provide the most detailed information regarding natural disasters.	1.746
18	I feel that to get the fastest updates and the best links (e.g., videos, audio files, maps, photos) on natural disasters I use traditional and online newspapers.	1.386
1	I feel that Twitter is the best way to get immediate information regarding natural disasters.	-1.033
10	I like to provide commentary about natural disasters on online blogs addressing natural disasters.	-1.143
40	I just need the warning sirens to go off, after that I don't need fast updates or great links (e.g., videos, audio files, maps, photos) about natural disasters.	-1.162
16	I feel that Twitter seems to be the only place to get fast updates and great links (e.g. videos, audio files, maps, photos) on natural disasters.	-1.195
38	I feel that when it comes to natural disasters, it if is not happening to me I don't care about getting information about it.	-1.662

\* Scores on this table do not include a full type array. Instead, only those 5 that the type had the most agreement with and those 5 that the type had the most disagreement with are listed.

**Type 3 - Apathetic Minimalists.** The third type, Apathetic Minimalists, were remarkably unique compared to the other identified types, as they were only concerned with receiving initial, trustworthy information about MDEs in the form of television coverage (+4,  $z=1.316$ ). "Television reports give you live coverage with the whole, true story about what's happening," one participant stated. After the initial MDE warning, these individuals did not need or want fast updates or great links (+4,  $z=1.055$ ). Unlike the other identified types, who indicated their compassion for others, Apathetic Minimalists were unconcerned about individuals affected by MDEs. They did not generally volunteer or donate (+5, 2.424) and did not seem to trust organizations aiding in collecting donations. "I don't volunteer because usually I don't have time," one participant explained. "I usually don't trust organizations that give away money and even if I did, it's hard to feel compassion when you're not there," another said. In addition, Apathetic Minimalists did not care to express emotions regarding natural disasters (+5, 2.315), especially in the form of online blogging (-4, -1.601). "I don't think it is necessary to share my feelings about natural disasters," one participant stated. (See Table 4)

**Table 4**  
*Z-scores and Statements for Type 3 — Apathetic Minimalists*

Statement Number	Statement	Z-score
42	I don't generally volunteer or donate following natural disasters.	2.424
41	I don't feel the need to express my emotions regarding natural disasters with others.	2.315

Statement Number	Statement	Z-score
19	I feel that television seems to be the only place to get fast updates and great links (e.g., videos, audio files, maps, photos) on natural disasters.	1.316
27	I feel that during a natural disaster television allows me to best experience other peoples' emotional stories.	1.089
40	I just need the warning sirens to go off, after that I don't need fast updates or great links (e.g., videos, audio files, maps, photos) about natural disasters.	1.055
31	I feel that online blogs are a great way to show support (e.g. volunteering/donating) for natural disaster victims.	-1.363
37	I feel that following a natural disaster I prefer to act based on volunteering/donation information provided in magazines.	-1.532
24	I feel that online blogs allow me to share when I am feeling nervous, scared or worried during a natural disaster.	-1.601
22	I feel that online blogs are the best places to get fast updates and great links (e.g. videos, audio files, maps, photos).	-1.742
10	I like to provide commentary about natural disasters on online blogs addressing natural disasters.	-1.778

\* Scores on this table do not include a full type array. Instead, only those 5 that the type had the most agreement with and those 5 that the type had the most disagreement with are listed.

**Type 4 — Social Media Neophytes.** The fourth type, Social Media Neophytes, preferred live television coverage, but also utilized Facebook moderately during MDEs. Live television reports allowed these individuals to receive the best coverage (+5,  $z=2.141$ ) due to their yearning for experiential media. "Television is the best way because it shows live news and we hear live sounds too," one participant explained. "They show live, clear videos usually straight from the live location," another added. Social Media Neophytes were comfortable using Facebook; however, they did not want to employ Twitter in their social media usage. These individuals felt Facebook provided the fastest updates and best links (+5,  $z=1.883$ ) and enabled them to express views about MDEs (+4, 1.167). "I feel Facebook is the fastest updated media (due to smartphones) that I look at many times daily, and allows photos, videos etc. to be uploaded," a participant explained. Another participant described how Facebook/MySpace could be used to support and transmit information. "Facebook/MySpace allows everyone to set up support groups and make statuses about the event occurring." Much like other identified groups, Social Media Neophytes were benevolent and generally volunteered or donated following MDEs (-4,  $z=-1.663$ ). "I volunteer after disasters a lot," one participant noted. (See Table 5.)

**Table 5**  
*Z-scores and Statements for Type 4—Social Media Neophytes*

Statement Number	Statement	Z-score
6	I feel that I get the best natural disaster coverage from television reports.	2.141

Statement Number	Statement	Z-score
17	I feel that Facebook/MySpace provides the fastest updates and best links (e.g., videos, audio files, maps, photos) on natural disasters.	1.883
19	I feel that television seems to be the only place to get fast updates and great links (e.g., videos, audio files, maps, photos) on natural disasters.	1.551
27	I feel that during a natural disaster television allows me to best experience other peoples' emotional stories.	1.192
11	I feel that Facebook/MySpace enable me to express my views about natural disasters.	1.167
30	I feel that when it comes to showing support (e.g. volunteering/donating) for natural disaster victims I prefer to use Twitter.	-1.532
23	I feel that when I am nervous, scared or worried during a natural disaster Twitter allows me to share those feelings with others.	-1.556
42	I don't generally volunteer or donate following natural disasters.	-1.663
9	I feel that the best way to express my opinions regarding natural disasters is to Tweet them on Twitter.	-1.747
1	I feel that Twitter is the best way to get immediate information regarding natural disasters.	-1.839

\* Scores on this table do not include a full type array. Instead, only those 5 that the type had the most agreement with and those 5 that the type had the most disagreement with are listed.

**Type 5 – Avid News-Gatherers and Contributors.** The fifth type, Avid News-Gatherers and Contributors, were well versed about current events in their environment, enjoyed reading the news and felt the need to contribute in conversations as a coping mechanism. “I love being in ‘the know.’ I enjoy watching the news and reading newspapers about current events,” one participant stated. They felt television provided the best MDE coverage (+5,  $z=2.063$ ) and a rich account of peoples’ emotional stories (+5,  $z=1.650$ ). “Televised reports can be on the scene of a disaster, which gives you a better feel for it,” a participant said. As Avid News-Gatherers and Contributors, these individuals wanted detailed information and felt it is “ignorant” to not care about getting information regarding MDEs if it’s not happening to them (-5,  $z=-2.182$ ). “We are in the middle of a media revolution, and I want to know as much as I can about what is happening around me,” a participant explained. Another participant added, “It is ignorant not to care about something just because it doesn’t affect you personally.” Compassion toward others was a key characteristic of this type. These news-loving individuals felt the need to create their own content by expressing their views on Facebook/MySpace (+4,  $z=1.414$ ), share their emotions with others on Facebook/MySpace (+4,  $z=1.332$ ) and share their opinions regarding MDEs with others (-5,  $z=-1.685$ ). They felt contributing and participating in conversations helped them cope during MDEs. “Expressing my emotions about natural disasters is the only way I can cope with them,” one participant said. However, Avid News-Gatherers and

Contributors did not want to show support via Twitter (-4,  $z=1.175$ ) and did not feel Twitter was the best way to express their emotions (-4,  $z=-1.275$ ). They were social media users, but Twitter did not serve a purpose for their needs when MDEs occurred. (See Table 6.)

**Table 6**  
**Z-scores and Statement for Type 5 — Insatiable News-Gatherers and Contributors**

Statement Number	Statement	Z-score
6	I feel that I get the best natural disaster coverage from television reports.	2.063
27	I feel that during a natural disaster television allows me to best experience other peoples' emotional stories.	1.65
11	I feel that Facebook/MySpace enable me to express my views about natural disasters.	1.414
25	I feel that when I am nervous, scared or worried during a natural disaster Facebook/MySpace allow me to share those feelings with others.	1.332
29	I feel that following a natural disaster magazines allow me to best experience other peoples' emotional stories.	1.263
30	I feel that when it comes to showing support (e.g. volunteering/donating) for natural disaster victims I prefer to use Twitter.	-1.175
40	I just need the warning sirens to go off, after that I don't need fast updates or great links (e.g., videos, audio files, maps, photos) about natural disasters.	-1.244
9	I feel that the best way to express my opinions regarding natural disasters is to Tweet them on Twitter.	-1.275
39	I don't care to share my opinions regarding natural disasters with others.	-1.685
38	I feel that when it comes to natural disasters, if it is not happening to me I don't care about getting information about it.	-2.182

\* Scores on this table do not include a full type array. Instead, only those 5 that the type had the most agreement with and those 5 that the type had the most disagreement with are listed.

## Discussion

Q methodology is uniquely suited to studying Quarantelli's (1987) quest for profiles of how audiences perceive and utilize media during MDEs, an area imperative to understand as individuals must have access to accurate, reputable information to respond to, mitigate the damages of and recover from crises (Dynes & Quarantelli, 1968; Quarantelli, 1987; Loges, 1994; Wachtendorf & Kendra, 2005; Sutton, 2012). MSD suggests, during MDEs, individuals' information goals increase and their dependency upon media to meet those goals increases accordingly. Five factors emerged from the analysis of the Q sorts completed by participants, resulting in different MSD types: Media Cognizant Utilitarians, Unbiased-Information Seekers, Apathetic Minimalists, Social Media Neophytes, and Avid News-Gatherers and Contributors. Interestingly, our participants implied social media were not the preferred method of communication

during MDEs. Instead, four of the five MSD types (Media Cognizant Utilitarians, Unbiased-Information Seekers, Social Media Neophytes and Avid News-Gatherers and Contributors) relied heavily upon television coverage during MDEs. Recent research by Riffe, Lacy and Varouhakis (2008) and Lee (2012) suggests individual MSD shifts away from traditional media toward social media based on changes in ability to create and disseminate information as well as gather in-depth information quickly. The findings of this study suggest that, although millennials are perceived as avid consumers of social media, millennials do not entirely replace traditional media with new media when seeking and/or disseminating information about MDEs. Rather, new media and traditional media supplemented each other, a premise scholars continue to argue (Althaus & Tewksbury, 2000; Diddi & LaRose, 2006; Holbert, 2005; Stempel, Hargrove & Bernt, 2000).

Several goals noted in recent research on social media use during MDEs include *sharing information* (Palen & Vieweg, 2008; Qu et al., 2009; Mendoza et al., 2010; Starbird et al., 2010; Sutton, 2010; Acar & Muraki, 2011; Heverin & Zach, 2012; Shaw, Burgess, Crawford & Bruns, 2013; Panagiotopoulos, Bigdeli & Sams, 2014; Starbird et al., 2014), *seeking information* (Shklovski, Burke, Kiesler & Kraut, 2008; Acar & Muraki, 2011; Qu et al., 2011; Shaw, Burgess, Crawford & Bruns, 2013), *communicating emotions and opinions* (Palen & Liu, 2007; Hjorth & Kim, 2011; Heverin & Zach, 2012) and *organizing action and assistance* (Palen & Liu, 2007; Qu et al., 2009; Vieweg et al., 2010; Acar & Muraki, 2011; Starbird & Palen, 2011; Qu et al., 2011; Mark et al., 2012; Sarcevic et al., 2012; Heverin & Zach, 2012; Saleem, Xu & Ruths, 2014; Panagiotopoulos, Bigdeli & Sams, 2014). Thus, this study examined millennials' preferences regarding use of traditional and social media during MDEs for each of these goals.

In terms of information seeking, Media Cognizant Utilitarians felt television and Twitter were the best media for detailed and immediate disaster information, whereas Unbiased-Information Seekers felt traditional and online newspapers provided the best disaster coverage. Three of the five MSD types (Unbiased-Information Seekers, Apathetic Minimalists and Social Media Neophytes) preferred television for information sharing. Media Cognizant Utilitarians felt Twitter and Facebook/MySpace were the best ways to share opinions, while television allowed them to experience (not share) emotions. Avid News-Gatherers and Contributors felt television and magazines were the best media for experiencing emotions, but when it came to sharing opinions noted Facebook/MySpace was their preferred media. Interestingly, none of the typologies indicated media were central to taking action (volunteering/donating) for disaster victims following an MDE.

Another remarkable finding was Apathetic Minimalists indicated they didn't want media information (just warning sirens) during an MDE and had no desire to express emotions about MDEs. Furthermore, they noted they generally didn't volunteer or donate following MDEs. Overall, it seems this millennial group preferred to be uninformed, disinterested and dispassionate about MDEs – a far cry from the depiction of the millennial generation as socially conscious activists and volunteers dedicated to improving society (Greenberg, 2008; Burnstein, 2013; Saratovsky & Feldmann, 2013). Moreover, their lack of MSD following initial reports of MDE threat is worrisome, as subsequent evacuation or damage control (e.g., boil water) messages may not reach this audience. Thus, disaster communication professionals will need to discover ways other than media to get mitigation and recovery messages to this apathetic audience.



### Theoretical Implications

MSD suggests individuals regularly use certain media to attain goals of orientation, play and understanding (Ball-Rokeach, 1985, p. 496; Ball-Rokeach, 1998; Hirshberg, Dillman & Ball-Rokeach, 1986; Loges, 1994; Loges & Ball-Rokeach, 1993; Morton & Duck, 2000). However, MSD can be greatly influenced by changes in social environment (Ball-Rokeach, 1985; Loges, 1994). For example, during MDEs reliance upon media systems increases as individuals deal with threat and ambiguity (Ball-Rokeach, 1998; Loges, 1994; Lowrey, 2004). Our study showed Media Cognizant Utilitarians and Avid News-Gatherers and Contributors wanted to seek information as well as share information during MDEs, turning to television for the former and social media for the latter. Their statements suggested that during the event they were sense-making (i.e., want to keep up, see/hear, know what's happening) and coping (i.e., express emotions, get a feel for things).

Unbiased Information Seekers explained their MSD on traditional media (i.e., television and newspapers) during the MDE as looking for the most up-to-date, edited and detailed information. They were not interested in "false, biased" information from Twitter, "opinionated" news from blogs or "rumors" from Facebook/MySpace. The command post model proposed by Quarantelli (1996) suggests official/emergency sources provide information during times of crisis. Millennials, familiar with television as a good way to get this viewpoint – rather than sift through ambiguous and irrelevant posts – may have defaulted to dependence upon this medium. Thus, rather than reading a string of "what happened" questions and "sending prayers" responses on their social media sites, millennials may have turned to television for sense-making information. As noted by Quarantelli (1997), the "open gates" model of computer-mediated communication technologies may not increase audience members' intelligence, knowledge or understanding during MDEs.

We suggest that, during the *problematic environ* of an earthquake, millennials' threat levels escalated, and audiences reevaluated their media systems. In some cases, this may have changed millennials' reliance upon different media; in others, it may have made them seek out different types of information (sharing emotions and opinions or organizing for activism) they would not use their media systems for everyday. For example, Social Media Neophytes indicated they were using Facebook/MySpace to create support groups and monitor statuses of those affected by the MDE. In everyday life, these millennials likely use Facebook for play, but during the MDE, Facebook became a way of organizing and acting.

Thus, although many of these millennials utilize social media constantly in their daily lives (Duggan, Lampe, Lenhart & Madden [2015] suggest social media users frequent the following on a daily basis: Facebook, 70%; Instagram, 49%; Twitter, 36%; Pinterest, 17% and LinkedIn, 13%), when the earthquake occurred, millennials turned to a medium – television – they trusted to provide credible, reliable information about the MDE. This coincides with research suggesting mass media usage surpasses social media and interpersonal communication during MDEs (Hirschburg, Dillman & Ball-Rokeach, 1986; Hindman & Coyle, 1999; Lowrey, 2004).

### Caveats and Future Research

Unfortunately, this study had some limitations that must be considered. Questionnaire and self-reporting errors hindered the demographic and subject characteristics data; thus, valuable media usage information was not reported. Use of a college-educated millennial sample is also problematic, as MSD may differ between this audience and a

non-college-educated millennial audience. Thus, future research should use a broader millennial sample. Additionally, there was a chance of error in the creation of the Q statement used to explore preferences. Social media statements reflected the nature of individuals participating in the MDE conversation and becoming content producers. Traditional media statements also reflected this theme; however, traditional media does not readily allow for individuals to participate or become content producers as efficiently as social media. In addition, the factors produced by Q method only explained 49% of the respondents' Q sorts, leaving 51% of the variance unexplained. This may mean millennials prefer to use media differently than the statements presented during the sorts. Finally, these statements were based on crisis communication themes found in social media studies. Future research should use interviews to gather statements reflecting media system usage traits before MDEs and compare them to after MDEs.

### Conclusion

Millennials preferred television reports because of the experiential nature of the media; it allowed them to view and experience MDEs and aftereffects first-hand. On the other hand, social media were used as a coping tool wherein students were able to express their emotions, views or opinions about MDEs. This suggests that, although millennials are familiar with social media and employ it during MDEs, they prefer to receive information about these events from professional news outlets such as television news broadcasts (e.g., command post model). Findings may indicate that millennials still prefer what they consider to be "trustworthy" sources (i.e., traditional media sources that go through the gatekeeping process, described by Shoemaker [1996]).

Overall, knowledge from this study can improve disaster communication by providing profiles of millennials' media use during crises (Quarantelli, 1987). Understanding which media are being used by this audience in response, mitigation and recovery during and after an MDE may provide important insight into where to direct messages for coping, sense-making and organizing. Additionally, communication professionals may benefit from this understanding of audience members and which media they are likely to use to help spread accurate MDE information and to address rumors. Whether millennials were seeking information via television news reports for experiential purposes and trustworthy information or using social media to express emotions and opinions during MDEs, media continuously served specific purposes for millennials' disaster communication needs. Therefore, disaster communication plans must acknowledge the strengths of each media outlet, and disaster messages must play to those strengths.

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**Appendix**  
**Statements and Factor Arrays**

No.	Statement	Factor				
		1	2	3	4	5
<b>Seeking Information</b>						
1	I feel that Twitter is the best way to get immediate information regarding natural disasters.	+4	-4	+1	-5	-1
2	I feel that online blogs are the best way to access detailed information regarding natural disasters.	-2	-2	-2	-1	+2
3	I feel that I get better information regarding natural disasters from my friends and colleagues on Facebook/MySpace.	+1	-3	-2	+3	-1
4	I feel that texting is the best way to get immediate information regarding natural disasters.	+2	0	+2	+3	-2
5	I feel that traditional and online newspapers provide the most detailed information regarding natural disasters.	0	+4	0	0	+2
6	I feel that I get the best natural disaster coverage from television reports.	+5	+5	+3	+5	+5
7	I feel that radio gives me the best immediate information regarding natural disasters.	0	+3	-1	+1	+1
8	I feel that when it comes to detailed information regarding natural disasters, magazines provide the best overall reporting.	-1	0	0	-1	-3
<b>Sharing Opinions</b>						
9	I feel that the best way to express my opinions regarding natural disasters is to Tweet them on Twitter.	+4	-3	+3	-5	-4
10	I like to provide commentary about natural disasters on online blogs addressing natural disasters.	-2	-4	-5	-2	+3
11	I feel that Facebook/MySpace enable me to express my views about natural disasters.	+4	-2	+2	+4	+4
12	I feel that when it comes to sharing opinions about natural disasters I prefer to write in to traditional and online newspapers (either through comments online or a letter to the editor).	-3	+1	-2	-2	+3
13	I feel that calling in or e-mailing	-1	+1	-3	-1	-3

No.	Statement	Factor				
		1	2	3	4	5
	television news stations are the best ways to share my opinions about natural disasters.					
14	I feel that I can share my views about natural disasters by calling into radio stations.	-3	+1	-3	+1	+1
15	I feel that after natural disasters occur I can best express my opinions by writing a letter to a magazine.	-4	0	-2	-3	-2
<b>Sharing Information</b>						
16	I feel that Twitter seems to be the only place to get fast updates and great links (e.g. videos, audio files, maps, photos) on natural disasters.	+2	-5	-1	-3	-3
17	I feel that Facebook/MySpace provides the fastest updates and best links (e.g., videos, audio files, maps, photos) on natural disasters.	+3	-1	0	+5	-1
18	I feel that to get the fastest updates and the best links (e.g., videos, audio files, maps, photos) on natural disasters I use traditional and online newspapers.	-2	+3	-1	+1	+2
19	I feel that television seems to be the only place to get fast updates and great links (e.g., videos, audio files, maps, photos) on natural disasters.	+2	+4	+4	+4	0
20	I feel that to get the fastest updates and the best links (e.g., videos, audio files, maps, photos) on natural disasters I use radio.	-3	+2	-2	0	-2
21	I feel that magazines provide the most detailed updates and best links (e.g., videos, audio files, maps, photos) after natural disasters.	-2	-1	0	0	-3
22	I feel that online blogs are the best places to get fast updates and great links (e.g. videos, audio files, maps, photos).	0	-2	-5	+2	0
<b>Expressing Emotion</b>						
23	I feel that when I am nervous, scared or worried during a natural disaster Twitter allows me to share those feelings with others.	+3	-3	+3	-4	0
24	I feel that online blogs allow me to share when I am feeling nervous, scared or	+1	-2	-4	0	+2



No.	Statement	Factor				
		1	2	3	4	5
	worried during a natural disaster					
25	I feel that when I am nervous, scared or worried during a natural disaster Facebook/MySpace allow me to share those feelings with others.	+3	-3	+2	+3	+4
26	I feel that traditional and online newspapers allow me to find out about emotional stories experienced by others during natural disasters.	+1	+3	+1	0	+3
27	I feel that during a natural disaster television allows me to best experience other peoples' emotional stories.	+5	+5	+4	+4	+5
28	I feel that radio allows me to find out about emotional stories experienced by others during natural disasters.	0	+3	-1	+2	-2
29	I feel that following a natural disaster magazines allow me to best experience other peoples' emotional stories.	0	+1	+1	0	+4
<b>Taking Action</b>						
30	I feel that when it comes to showing support (e.g. volunteering/donating) for natural disaster victims I prefer to use Twitter.	+3	-1	0	-4	-4
31	I feel that online blogs are a great way to show support (e.g. volunteering/donating) for natural disaster victims.	-1	0	-4	+1	+1
32	I feel that when it comes to showing support (e.g. volunteering/donating) for natural disaster victims I prefer to use Facebook/MySpace.	+1	-1	+3	+2	+1
33	I feel that text-based donations are a great way to show support (e.g. volunteering/donating) for natural disaster victims.	+2	+2	+1	+3	0
34	I feel that traditional and online newspapers are a great way to show support (e.g. volunteering/donating) for natural disaster victims.	0	+2	-1	+1	+1
35	I feel that when it comes to showing support (e.g. volunteering/donating) for natural disaster victims I prefer to call-in to televised events (i.e. telethons, charity concerts).	-1	+1	-3	-1	-1
36	I feel that radio fundraisers are a great way to show support (e.g.	+1	+3	+1	+2	0

No.	Statement	Factor				
		1	2	3	4	5
	volunteering/donating) for natural disaster victims.					
37	I feel that following a natural disaster I prefer to act based on volunteering/donation information provided in magazines.	-1	+2	-4	-1	0
<b>Uninformed/ Disinterested/ Dispassionate</b>						
38	I feel that when it comes to natural disasters, it if is not happening to me I don't care about getting information about it.	-5	-5	0	-3	-5
39	I don't care to share my opinions regarding natural disasters with others.	-4	0	+2	-2	-5
40	I just need the warning sirens to go off, after that I don't need fast updates or great links (e.g., videos, audio files, maps, photos) about natural disasters.	-5	-4	+4	-2	-4
41	I don't feel the need to express my emotions regarding natural disasters with others.	-4	-1	+5	-3	-1
42	I don't generally volunteer or donate following natural disasters.	-3	0	+5	-4	+3