



Gender and Presence of Children: Examining Media Uses, Informational Needs, and Source Preferences during the Flint, Michigan, Water Crisis

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ABSTRACT

In 2014, a water crisis emerged in Flint, Michigan. Using uses and gratifications theory as the guiding framework, this study examines if crisis-related media uses, informational needs, and source preferences are related to respondents' gender and/or whether or not respondents had children. A random sample of 208 Flint residents yielded results that are largely consistent with extant research, although minor nuances were found. Media uses, preferred informational sources, and desire to receive future crisis-related health information varied between women and men. Women reported significantly higher use of Facebook and Instagram. However, there were *not* significant differences between genders or respondents with/without children regarding their future informational needs about crisis-related health topics. Results are discussed in relation to extant research, theory, and praxis. Limitations and future research are also discussed.

KEYWORDS: children, crisis communication, gender, informational needs, media use

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In April of 2014, the Municipal Water Department of Flint, Michigan, changed its water source from the treated water of the Detroit Water and Sewerage Department (DWSD) to the untreated water of the Flint River. Almost immediately there were issues with the water, resulting in several boil water advisories. For instance, fecal coliform bacterium was detected in August 2014 and total coliform bacteria in September 2014 (CNN, 2016). These bacteria are warning signs that can indicate the presence of *E. coli* and other disease-causing organisms (CNN, 2016). Furthermore, the Flint River water was highly corrosive and was not treated properly as anti-corrosion chemicals were not added to the water. The protective sedimentary layers of the water distribution system, known as the passivation layers, quickly dissolved (Masten et al., 2016). Subsequently, direct contact with both iron and lead pipes produced a variety of water contamination problems. Residents were exposed to a number of health threats including high levels of lead and disinfection by-products as well as bacterial contamination. Simultaneously, Flint experienced an outbreak of Legionnaires disease that was associated with the water (Masten et al., 2016). Although concerns about the water were expressed by Flint residents *and* independent researchers at the onset of the water switch, government officials were extremely slow to respond and some were accused of withholding information from the public (CNN, 2016; Gable & Buehler, 2017; Krings et al., 2019).

The City of Flint did not declare a state of emergency until December 2015. Genesee County and the State of Michigan followed suit with declarations of emergency in January 2016 (City of Flint, n.d.). However, by this time, the public had lost trust in government officials due to their slow response and overassurance about the water quality (CNN, 2016; Cuthbertson et al., 2016; Krings et al., 2019). The Flint Water Advisory Task Force (2016) concluded that, "The Flint water crisis is a story of government failure, intransigence, unpreparedness, delay, inaction, and environmental injustice," (n.p.). The crisis in Flint was further exacerbated by poor communication from public officials. As such, it is important to understand how communication processes functioned in this case, how affected residents used communication,

and how information seeking and media use varied among affected residents. Such understanding may shed light on the (in)effectiveness of communication strategies and inform theory and praxis.

This research queries the media uses, informational needs, and source preferences of Flint residents impacted by the city's water crisis. Specifically, gender and whether or not respondents had children are the central variables of focus. Lead—the principle contaminate in the Flint water crisis case—has a disproportional impact on the development of young children (Bellinger, 2016; Hanna-Attisha et al., 2016). For this reason, whether or not respondents had children was an important variable to consider for this research. To further elucidate the context of this research, a review of relevant literature is provided, which includes details on the grounding theoretical framework and presentation of hypotheses and research questions. Then, details of the methods are provided, followed by presentation of results. Based on the results, a discussion of theoretical and praxis-based implications follows. An acknowledgment of limitations concludes the paper.

Literature Review

Communication processes are instrumental during a crisis. They are used to manage emerging and ongoing threats and uncertainty, and educate the public about necessary protective actions (Sellnow & Seeger, 2013). Uncertainty can prompt information seeking behaviors, which are influenced by specific needs, especially during a crisis (Brashers et al., 2000). The public will typically seek crisis information from a variety of sources and will continue to do so throughout the crisis life cycle (e.g., Lai & Tang, 2018; Sellnow & Seeger, 2013; Sjöberg, 2018; Sommerfeldt, 2015). Prominent sources of information often include legacy mass media, social media, and interpersonal networks.

Numerous media types serve as sources of information during crises. Traditionally, legacy mass media have been primary sources of information surrounding crises and, in most cases, are considered valuable and timely sources of information (Park & Avery,

2018; Parmer et al., 2016; Savoia et al., 2017). In addition, social media—such as Facebook and Twitter—have emerged as important, flexible, and targeted channels for crisis communication (Eriksson & Olsson, 2016; Lin et al., 2016; Veil et al., 2011). As one may deduce, there are various perspectives on the utility and function of different media for crisis communication. One perspective suggests that “medium effects are stronger than the effects of crisis type,” on publics (Utz et al., 2013, p. 40). This claim warrants further investigation, especially because there are many other factors that influence publics’ media use and information seeking. For instance, the perceived credibility of informational sources during a crisis is imperative to consider, alongside medium effects and crisis type.

Perceived credibility of informational sources and media channels are important to consider in crisis contexts. Traditionally, legacy mass media have been perceived as more credible channels and sources of information during crises (Austin et al., 2012). Mass media sources, like major news outlets, often utilize eyewitnesses who provide viewers with recent, “front line” information during adverse events like crises (Westerman et al., 2014, p. 172). Recency of crisis-related information also impacts perceived source credibility, especially on social media (Westerman et al., 2014). Simply put, perceived source credibility is a key determinant in source evaluation for both legacy mass media and social media (Van Zoonen & van der Meer, 2015). In the context of the Flint water crisis, credibility of governmental sources may have been diminished due to slow response time and residents feeling as though their concerns about the water were ignored by governmental officials (Cuthbertson et al., 2016; Krings et al., 2019). Due to Flint’s unique crisis context and information environment, the perceived credibility of information forms (e.g., mass media, social media) and informational sources may have influenced residents to utilize new and/or different media or informational sources (e.g., Austin et al., 2012). As both legacy mass media and social media have been purported as channels that crisis-affected individuals utilize to gratify crisis-related informational needs, uses and gratifications theory is a relevant framework for this research.

Theoretical Framework

Uses and gratifications theory (UGT) is an applicable framework for examining media uses and informational needs during crises. According to UGT, audiences actively use media and seek information to become better informed about a particular topic or event, to identify with others in the situation, to entertain oneself, to enhance social interaction and/or, to escape or relieve stress (Katz, Blumler, & Gurevitch, 1974). As may be evident, UGT is based on the user's perspective and acknowledges that people consider their media uses based on awareness of their needs *and* the expectation that certain media will gratify those needs (Ruggiero, 2000). In essence, UGT focuses on "what people do with media" and suggests that media use is linked to personal identities (Blumler, 1979; Katz, Blumler, & Gurevitch, 1974), which may influence individuals' desired gratifications during a crisis. Media use may help crisis-affected individuals achieve multiple gratifications. For example, decreasing uncertainty and becoming better informed about the crisis event or associated health risks are two possible gratifications that can result from active, intentional media use(s) during crises (Houston et al., 2015; Lev-On, 2012; Macias et al., 2009). In using media to gratify crisis-related informational needs, users may perceive certain media to be more useful than others and, in this way, UGT posits that media compete with one another.

Media compete with other sources that help individuals fulfill their desired gratifications (Katz, Haas, & Gurevitch, 1973). When certain media or informational sources (i.e., government officials) do not help individuals gratify their needs, they may turn to alternative media and seek information from other sources (Katz, Haas, & Gurevitch, 1973). These (alternative) media uses can help individuals make informed decisions in crisis contexts. However, there is wide variation in publics' media use and informational needs during crises, which is why it is essential to empirically query *crisis-affected* publics' media uses and desired gratifications (e.g., Lachlan, Spence, & Seeger, 2009; Lu, 2018; Spence, Lachlan, & Griffin, 2007). Specifically, UGT suggests that individuals may receive, interpret, and use media in different ways depending on *their* specific needs and desired gratifications, which can be impacted by personal characteristics, demographic variables, identities, past

experiences, and so forth (Day et al., 2019; McQuail, 1984; Ruggiero, 2000). Gender is one variable that may impact media uses, informational needs, and desired gratifications. Extant research has highlighted differences among genders regarding media uses and informational needs in crisis contexts.

Gender and Crises

Gender can influence information seeking during crises (Seeger et al., 2002; Spence, Lachlan, & Burke, 2007, 2011; Spence et al., 2005). However, most extant research on gender and crises presents gender in a binary fashion, highlighting differences between women and men in their needs and responses (e.g., Lachlan, Spence, & Nelson, 2010). While there is a need to diversify the approach toward gender within crisis communication research and it is important to note the limitations that exist with a binary conceptualization, useful and applicable knowledge has been derived from previous studies that have employed such conceptualization. For example, extant research suggests that women are more inclined to seek out information during a crisis (Lachlan, Spence, & Seeger, 2009; Spence et al., 2008, 2011), perhaps because information seeking can function as a coping strategy for women during crises (Spence, Lachlan, & Burke, 2007). During crises, women may also “translate a relational orientation (i.e., concern for relationships) into a problem-solving orientation (i.e., ‘what information do I need to minimize the harm to my family’),” a process that is facilitated through information seeking (Burke et al., 2010, p. 34). Based on such findings, the following hypothesis (H) for this research is forwarded:

H1: Women are more likely than men to seek information about the Flint water crisis.

The type of information that women and men seek during a crisis also varies. In past crisis events, women have placed greater importance on information concerning specific mitigation resources and strategies, such as food and water resources, evacuation options, shelters, rescue efforts, the larger impact of the

crisis, connecting with friends and family, and locating healthcare or medicine (Seeger et al., 2002; Spence, Lachlan, & Burke, 2007; Spence et al., 2005). Women appear to be more concerned with socially positive responsibilities during crises, such as food and water distribution and shelter (Spence, Lachlan, & Burke, 2011). Men tend to place greater importance on issues related to crisis response and understanding the scope of the damage (Spence et al., 2011). These differences may be better explained through gender-related social roles and activities.

Social roles and activities, as well as culture and environmental upbringing, may help explain the impact of gender on risk perception and subsequent informational needs and media use (Gustafson, 1998; Peek & Fothergill, 2008). This notion is important to consider in crisis communication because risk perception can impact desired gratifications and subsequent media uses. Take, for example, Fothergill's (2004) finding that women generally view crisis warning messages as more credible, which may heighten their willingness to enact protective behaviors. It is possible that women's reception of warning messages and willingness to enact protective actions *could* be influenced by gender-related social roles and activities they fulfill. Women are often considered principle caregivers that are concerned about health-related issues and/or concerned about caring for the sick or injured (Enarson et al., 2006; Fothergill, 1999; Halvorson, 2004), which may influence their informational needs and subsequent media uses. Slow-moving water-related crises, like the Flint water crisis, often put "women's and children's health at risk and greatly expands the demands on mothers to keep children well," (Enarson et al., 2006, p. 136; also see Halvorson, 2004). Thus, gender may influence risk perception and subsequent informational needs and media uses during crises, which may be especially applicable to the Flint water crisis.

In Flint, 44% of children live in single-parent households and over 80% of all births in the city are to women who are not married (County Health Rankings, 2019; Mack, 2017). Additionally, "in Flint, the most common family type with children was that of a Female householder, with no spouse present (55.3 percent), while

the most common structure with children in the state [of Michigan] is the married-couple type with 65.4 percent," (Murembya & Guthrie, 2016, p. 10). Noting these statistics alongside Spence et al. (2008) suggestion that women's heightened relational orientation may evoke a problem-solving orientation that prompts information seeking during crises (previously mentioned in reference to H1) and the possibility that women are principle caregivers concerned about health (Enarson et al., 2006; Fothergill, 1999; Halvorson, 2004), it is possible that women in Flint may be more interested in health-related information than men. To further query the possible differences between women and men in terms of their crisis-related informational needs related to health, the following hypothesis is proposed:

H2: Women are more interested in gaining additional health-related information surrounding the Flint water crisis than men.

Research has noted differences in internet use between women and men during crises. Women have reported television, print media, and radio as more useful media during crises, while men have reported internet to be more useful (Lachlan, Spence, & Seeger, 2009; Spence et al., 2006). In contrast, women affected by Hurricane Katrina valued online expressive communication more than men (Procopio & Procopio, 2007). Specifically, women sought out information about family members, shared information with family and friends, and received emotional support through internet use (Procopio & Procopio, 2007). Thus, women's internet use in the context of Katrina was not *solely* to retrieve information about the disaster. Drawing from these findings, the following hypothesis is proposed:

H3: Men are more likely than women to want continued information about the Flint water crisis through internet sources.

Research regarding gender and social media use during crises is a growing area of scholarship. A study of Chinese internet users reported that women are more likely to utilize social media to communicate during a public emergency event than men (Xie et al., 2017). Similarly, women affected by Hurricane Sandy were

more inclined to seek information through Facebook than men (Hamama-Raz et al., 2015). Although hurricanes and Flint's crisis are different types of crises, they share attributes that are typical to most crises, such as evoking high levels of uncertainty, violating expectations, threatening goals and well-being, and each require a rapid response to mitigate harm (Sellnow & Seeger, 2013). However, "there are still many aspects of social media usage in crisis that are not adequately understood. One of these is the influence of gender on perception, attitudes and behaviour regarding usage of the new media," (Alexander, 2014, p. 730). Due to the lack of congruent research on gender and social media use *for information seeking* (rather than social support, for example) in human-caused crisis events, we propose the following research question (RQ):

RQ1: How do women and men report using social media for accessing information about the Flint water crisis?

Children and Crises

Individuals with children may exhibit different patterns of media use during crises than individuals without children (Hipper et al., 2018). Presence of children can also impact media use and preferred informational sources of caretakers/guardians/parents (hereby referred to as "parents"), which can vary depending on family characteristics. For example, parents of children with special healthcare needs prefer information from healthcare professionals, school personnel, and local government officials via in-person meetings, integrated in-person and online forums, or text messages and social media during emergencies (Hipper et al., 2018). Crisis type can also impact parents' information seeking and media use. During a terrorist attack, for example, parents have sought information from interpersonal networks and utilized social relationships to help them understand the crisis, gather information, and seek support (Rickwood et al., 2005; Tatar et al., 2011).

An important caveat related to the informational needs of parents is that they must first be *aware* of and understand their crisis-related informational needs (Archibald et al., 2015). Such

awareness and understanding is imperative during a crisis, especially for parents, because the effects of crises on children can be serious and, thus, may increase parents' desire to seek out crisis-related information. Children are more prone to experience psychological damage, post-traumatic stress disorder (PTSD), hindered development, and higher levels of fear and anxiety during and after a crisis (Abdeen et al., 2008; Allen et al., 2007; Martin, 2010). When considering the context of the Flint water crisis, it is important to understand children's increased vulnerability to lead due to "their greater fractional absorption of ingested lead and greater intake on a body-weight basis and because development of the central nervous system is easily derailed in ways that result in cognitive and behavioral abnormalities," (Bellinger, 2016, p. 1102). Therefore, the Flint water crisis had a disproportional impact on children (Hanna-Attisha et al., 2016), which may have heightened parents' risk perception, media use, and information seeking. For these reasons, the fourth hypothesis is proposed:

H4: Respondents with children will express higher levels of informational needs than respondents without children.

Although children may heighten parents' informational needs, desired gratifications, and subsequent media uses, they may also serve as positive facilitators to information seeking during crises. Public agencies' framing of crisis communication can also influence information seeking (Sjöberg, 2018). Overall, extant research posits that a range of media logics are used by parents to seek crisis-related information, which influences their expectations and evaluations of media and received crisis communication (Hipper et al., 2018; Sjöberg, 2018). In noting such findings, it is also important to recall that 44% of children in Flint live in single-parent households and the most common family type with children is female-headed households with no spouse present (55.3%) (County Health Rankings, 2019; Mack, 2017; Murembya & Guthrie, 2016). As such, we present the follow RQ:

RQ2: How do women without children, women with children, men with children, and men without children differ in their informational needs and patterns of media use?

In sum, this investigation of media uses, informational needs, and source preferences is set within the context of the Flint, Michigan, water crisis. Specifically, gender and whether or not respondents had children are queried as related to media uses, informational needs, and source preferences. Such phenomena are important to consider to ensure the relevancy of and accurate placement of crisis communication. Relevancy and accurate placement are important criteria for supporting core functions of crisis communication and meeting the informational needs of affected populations—especially vulnerable populations, like women and children with low socioeconomic status (Spence & Lachlan, 2016). Such populations are omnipresent in Flint (County Health Rankings, 2019; Mack, 2017; Murembya & Guthrie, 2016; U.S. Census Bureau, n.d.; U.S. Census Bureau, 2010).

Methods

Data were collected using a version of the Media Uses and Informational Sources survey. The survey was adapted to match the research setting; however, the scales and basis of the questions were not modified (see other uses of the measure in Day et al., 2019; Lachlan, Spence, & Seeger, 2009; Spence et al., 2006; Spence, Lachlan, & Griffin, 2007). The survey is grounded in UGT and media dependency theory, and designed to assess media uses and informational needs related to crisis events. Using five-point scales ranging from “strongly agree” to “strongly disagree,” respondents’ (1) feelings about the crisis, (2) current information gaps surrounding the crisis, and (3) desire to receive additional information about specific crisis-related topics were assessed. Reliability analyses yielded coefficients (Cronbach’s alpha) of 0.786, 0.927, and 0.953 for the scales, respectively. Another five-point scale ranging from “never” to “always” was used to record where respondents got information about important events in the Flint community, which yielded an alpha coefficient of 0.637. The lower alpha for this scale may be due to poor interrelatedness of the items when considering the context of this study (Tavakol & Dennick, 2011), as sources of information included various types

of traditional media, social media, and personal networks versus types of sources for only one medium per scale.

Once Institutional Review Board approval was granted, data collection began. Researchers used a random table of numbers (RTN) to select respondents for participation. Computer-generated, printed copies of RTNs were used to approach potential respondents. For example, a starting point was randomly identified for each point of data collection. If the first number in the identified RTN sequence was "7," the seventh individual that came through the water distribution site was asked if they were willing to complete a survey. Surveys were collected from June to November of 2016. Between June to August, collection occurred approximately twice per week and decreased to every other week between September and November as weather conditions and scheduling became more complicated during these months. Respondents were approached at the Flint Farmer's Market (June only) and at state-operated bottled water Points of Distribution (June through November). These locations were selected as points of data collection largely due to these locations affording access to the target population and permitting the researchers' presence.

A sample of 210 Flint residents was collected. However, only 208 surveys were usable as two respondents did not indicate their age on the survey. Respondents had to be 18 years of age or older to participate. Most respondents took the survey on their own. A small number of respondents (< 10) asked one of the researchers to read them the survey questions and record their answers. Less than 35 individuals that were approached declined to participate, most did not provide an explanation for their declination; however, at least two individuals at the bottled water Points of Distribution stated that they did not have time to complete a survey. Relevant programs in SPSS (version 24) were used in making statistical analyses for testing the research hypotheses and research questions. Over half of respondents were female and had child(ren) (see Table 1A, Table 1B, & Table 1C). While the focus of this study is on gender and whether or not respondents had children, race is an important variable to consider in the context of Flint's crisis. A majority of respondents identified as White, which is not representative of the demographics in Flint. The majority of

TABLE 1 Respondents' Demographic Information

1A Gender of Respondents		
Gender	N	%
Female	125	60.1
Male	82	39.4
No response	1	0.5
Total	208	100

1B Respondents with/out Children		
Children	N	%
Yes	136	65.3
No	65	31.3
No response	7	3.4
Total	208	100

1C Racial Identity		
Race	N	%
African American	74	35.6
White	107	51.4
Other races	24	11.5
No response	3	1.4
Total	208	100

Flint residents identify as Black/African American (U.S. Census Bureau, n.d., 2010); thus, the sample is not fully representative of Flint's population.

Results

Gender and Information Seeking

Results regarding the first hypothesis were mixed (H_1). Women ($M = 0.64$, $SD = 0.48$) were less likely than men ($M = 0.49$, $SD = 0.5$) to get current information about the water crisis from friends face-to-face $\chi^2(1, N = 206) = 4.51$, $p = 0.034$, $V = 0.148$ (see Table 2). Women ($M = 0.66$, $SD = 0.48$) were also more likely than men ($M = 0.89$, $SD = 0.32$) to get current information from a government website $\chi^2(1, N = 206) = 13.89$, $p < 0.01$, $V = 0.26$.

TABLE 2 Respondents' Current Sources for Information about the Water Crisis, by Gender

Current Sources of Information about the Water Crisis: 0 = yes, 1 = no				
Source	Gender	N	Mean	Std. Deviation
Twitter	Female	124	0.92	0.27
	Male	82	0.93	0.26
Facebook	Female	124	0.44	0.50
	Male	82	0.56	0.50
Instagram	Female	124	0.90	0.31
	Male	82	0.98	0.16
Face-to-face conversation with friend	Female	124	0.64	0.48
	Male	82	0.49	0.50
Media—Radio	Female	123	0.65	0.48
	Male	82	0.67	0.47
Media—TV	Female	124	0.30	0.46
	Male	82	0.34	0.48
Media Website	Female	124	0.65	0.48
	Male	82	0.65	0.48
Government Website	Female	124	0.66	0.48
	Male	82	0.89	0.32

Gender and Health-Related Information

Analyses did not support the second hypothesis (H₂) as there were not significant differences between women's and men's future informational needs about crisis-related health topics (see Table 3). Specifically, there were *no* significant differences between genders as related to their desire to receive additional health-related information about the municipal tap water as a possible source of Legionnaires disease; E. coli contamination of the municipal tap water; the source of lead contamination in the municipal tap water; diet as a way to possibly reduce lead contamination; and paint, soil, and dust as possible sources of lead contamination.

TABLE 3 Respondents' Desire for Future Crisis-Related Health Information, by Gender

Desire for Future Crisis-Related Health Information: 0 = do not agree at all, 4 = strongly agree				
Health Topic	Gender	N	Mean	Std. Deviation
Legionnaires disease	Female	118	3.22	1.32
	Male	78	3.1	1.39
E. coli	Female	118	3.31	1.24
	Male	78	3.2	1.27
Source of lead contamination of tap water	Female	117	3.35	1.18
	Male	78	3.17	1.31
Paint as a possible source of lead contamination	Female	117	2.75	1.56
	Male	78	2.7	1.56
Soil as a possible source of lead contamination	Female	116	3.11	1.34
	Male	77	2.92	1.37
Dust as a possible source of lead contamination	Female	117	2.96	1.37
	Male	78	2.56	1.57
Diet as a way to reduce lead contamination	Female	115	3.01	1.42
	Male	78	2.86	1.49

Gender and Internet Sources

Partial support for the third hypothesis (H₃) was found as men ($M = 0.17$, $SD = 0.38$) were more likely than women ($M = 0.3$, $SD = 0.46$) to want to receive *future* information about the crisis from general media sources versus other sources (e.g., phone call, text), $\chi^2(1, N = 197) = 4.65$, $p = 0.03$, $V = 0.15$ (see Table 4). This result is interesting considering that men ($M = 0.65$, $SD = 0.48$) did not report media as top sources to receive *current* information about the water crisis (see Table 2). Further, while men ($M = 0.89$, $SD = 0.32$) indicated that they rarely got *current* information about the

TABLE 4 Respondents' Preferences for Receiving Future Information about the Water Crisis, by Gender

Preferences for Receiving Future Information about Water Crisis: 0 = yes, 1 = no				
Channel	Gender	N	Mean	Std. Deviation
Email	Female	120	0.83	0.37
	Male	78	0.77	0.42
Text	Female	120	0.95	0.22
	Male	78	0.91	0.29
Social media	Female	120	0.75	0.44
	Male	78	0.74	0.44
Media (general)	Female	119	0.30	0.46
	Male	78	0.17	0.38
Website (general)	Female	119	0.40	0.49
	Male	78	0.47	0.50
Media website	Female	120	0.65	0.48
	Male	78	0.71	0.46
Government website	Female	120	0.63	0.49
	Male	78	0.71	0.46
Public officials via social media	Female	120	0.75	0.44
	Male	78	0.74	0.44

crisis via governmental websites, they indicated greater preference to receive *future* information about the crisis from governmental websites ($M = 0.71$, $SD = 0.46$).

Gender and Social Media

Findings for the first research question (RQ₁) revealed that women ($M = 3.39$, $SD = 1.52$) used Facebook more than men ($M = 2.78$, $SD = 1.6$) to gather information about important events in the Flint community $t(162) = 2.45$, $p = 0.016$, $d = 0.394$ (see Table 5). Women ($M = 0.9$, $SD = 0.31$) were also more likely than men ($M = 0.98$, $SD = 0.16$) to get *current* information about the water crisis via Instagram $\chi^2(1, N = 206) = 4.73$, $p = 0.03$, $V = 0.152$ (see Table 2). There were *no* statistically significant differences between

TABLE 5 Respondents' Preferences for Receiving Information about Important Events in Flint, by Gender

Preferences for Receiving Information about Important Events: 1 = never, 5 = always				
Channel	Gender	N	Mean	Std. Deviation
Radio	Female	98	3.05	1.52
	Male	64	3.17	1.44
Television	Female	109	4.21	1.02
	Male	73	4.14	1.19
Newspapers	Female	100	3.21	1.47
	Male	64	3.13	1.63
Friends and neighbors	Female	97	3.70	1.21
	Male	59	3.42	1.24
Facebook	Female	101	3.39	1.52
	Male	63	2.78	1.60
Twitter	Female	90	1.62	1.30
	Male	56	1.68	1.35
Websites	Female	101	3.54	1.55
	Male	59	3.46	1.50
Family members	Female	97	3.78	1.28
	Male	62	3.58	1.29

women ($M = 0.75$, $SD = 0.44$) and men ($M = 0.74$, $SD = 0.44$) in their desire to receive *future* information about the water crisis from public officials via social media $\chi^2(1, N = 198) = 0.01$, $p = 0.92$, $V = 0.007$ (see Table 4). Additionally, there were *no* statistically significant differences between women ($M = 0.55$, $SD = 0.5$) and men ($M = 0.64$, $SD = 0.48$) in their preference to receive *future* information about the water crisis from sources on social media $\chi^2(1, N = 198) = 1.61$, $p = 0.2$, $V = 0.09$ (see Table 4).

Children and Informational Needs

Regarding the fourth hypothesis (H_4), respondents with children ($M = 2.94$, $SD = 1.42$), were more likely to want additional information about dust as a source of lead contamination than

respondents without children ($M = 2.47$, $SD = 1.54$), $t(187) = 2.07$, $p = 0.04$, $d = 0.321$. However, there were *no* other statistically significant differences between respondents with children and those without children regarding crisis-related informational needs.

Gender, Children, Informational Needs, and Media Use

Tests for RQ2 noted differences in the use of government websites to seek out *current* information about the crisis among women with children, women without children, men with children, and men without children, $\chi^2(3, N = 199) = 13.36$, $p = 0.004$, $V = 0.258$. Bonferroni post-hoc comparisons indicated the statistical difference was between women with children ($M = 0.64$, $SD = 0.48$) and men without children ($M = 0.91$, $SD = 0.3$) ($p = 0.015$) as well as between women with children ($M = 0.64$, $SD = 0.48$) and men with children ($M = 0.86$, $SD = 0.35$) ($p = 0.026$). Specifically, women with children were more likely to use government websites to seek out current information about the crisis. The four groups also differed in their preferences to seek out *current* information about the crisis via “other” websites (e.g., nongovernmental organizations’ websites, like community nonprofit websites or local faith-based organization websites), $\chi^2(3, N = 199) = 7.992$, $p = 0.046$, $V = 0.2$. Bonferroni post-hoc comparisons indicated the statistical difference was between men with children ($M = 1.0$, $SD = 0.00$) and men without children ($M = 0.84$, $SD = 0.37$) ($p = 0.039$), indicating that men with children were more likely than men without children to seek out current information about the crisis from websites *not* associated with government or media. Lastly, there was a significant difference among the four groups’ preference toward and use of phone calls from public officials to receive current information about the crisis $\chi^2(3, N = 198) = 12.455$, $p = 0.006$, $V = 0.251$. Bonferroni post-hoc comparisons indicated the statistical difference was between women without children ($M = 0.76$, $SD = 0.44$) and women with children ($M = 0.94$, $SD = 0.23$) ($p = 0.006$) as well as between women without children ($M = 0.76$, $SD = 0.44$) and men with children ($M = 0.95$, $SD = 0.21$) ($p = 0.012$). Simply put, results suggest a relationship between women without children and a preference toward receiving information about the

crisis from public officials via phone more than women with children and more than men with children.

There were *no* statistically significant differences between women without children ($M = 3.28$, $SD = 1.28$), women with children ($M = 3.37$, $SD = 1.15$), men without children ($M = 3.03$, $SD = 1.47$), and men with children ($M = 3.27$, $SD = 1.23$) regarding their *future* informational needs. Strikingly, there were *no* statistically significant differences among the four groups' desire to receive future crisis-related health information. There were also *no* statistically significant differences among the four groups' preferred media and preferred sources for receiving future information about the water crisis.

Implications and Discussion

Results of this study suggest relationships between media uses, informational needs, and source preferences among Flint residents as related to gender and whether or not individuals had children. Specifically, results suggest women and men varied in their preferred informational sources and some media uses, but there were not statistically significant differences between women and men in their desire to receive *future* crisis-related health information (e.g., Legionnaires disease). Respondents with children wanted more information about dust as a possible source of lead contamination compared to respondents without children. Women with children were more likely to prefer receiving current information about the crisis from government websites and, in general, women utilized Facebook and Instagram more than men to gather information about the crisis. To a greater degree than men without children, men with children were more likely to seek out current information about the crisis via "other" websites, such as nongovernmental organizations' websites. Surprisingly, there were not significant differences among women without children, women with children, men without children, and men with children regarding their desire for future crisis-related health information. This finding may be a function of the intense focus on the immediate needs for information related to the crisis, rather than focus on future informational needs. The pressing, immediate needs of the crisis

may have decreased respondents' focus on their speculative future informational needs. As such, it is important to discuss these findings in relation to extant research.

Many results of this study are consistent with extant research. During crises, women generally have higher informational needs and seek out information at higher levels than men (Spence et al., 2006). These results *may* be explained by roles women have traditionally taken on as caregivers, mothers, helpers for the injured, and general household managers, which often become more demanding during a crisis (Enarson et al., 2006; Fothergill, 1999; Halvorson, 2004). In Flint, this may be even more pressing as 44% of children live in single-parent households and over 80% of all births in the city are to unmarried women (County Health Rankings, 2019; Mack, 2017). Based on this information, being a mother may have increased respondents' need for crisis-related information and may have led to higher levels of information seeking on social media (Enarson et al., 2006; Hamama-Raz et al., 2015; Spence et al., 2008). Yet, men with children did indicate significantly high levels of information seeking on specific media, such as websites *not* associated with government or media (e.g., community nonprofit websites, local faith-based organization websites). Therefore, it is also possible that being a father may have increased respondents' crisis-related informational needs and may have led to higher levels of information seeking on specific media. To meet the crisis-related informational needs of parents, practitioners should consider how they can strategically place crisis communication messages to effectively reach this target audience (Seeger & Sellnow, 2019). Results from this study suggest that messages about current informational needs should be placed on government websites when trying to reach mothers and nongovernmental websites when trying to reach fathers. However, additional research is needed to confirm this suggestion as related to other crisis contexts and the relationship among gender, whether or not an individual has children, information seeking, and media uses during crises.

Being a parent is an identity that can function to influence media use during crises. However, little support was found for the fourth hypotheses. The only topic that respondents with children

wanted additional information about at significantly higher levels than respondents without children was dust as a source of lead contamination. Furthermore, the second hypothesis asserted that women would be more interested than men in gaining additional health-related information about the crisis. However, data did not support this hypothesis. Extant research has also reported similar findings. In a study about the I-35W bridge collapse in Minneapolis, Minnesota, Lachlan, Spence, and Nelson (2010) did not discover gender differences related to information seeking.

There are several possible explanations as to why there were not significant differences among respondents' informational needs based on gender and whether or not they had children. First, *all* members of the Flint community may have been similarly concerned about health-related topics and the impact of lead contamination on children. Other familial relationships, like siblings, aunts, uncles, and grandparents may have had similar informational needs about lead and other health-related topics. In addition, lead was only *one* of several health issues and risks associated with Flint's water crisis (Day et al., 2019; Hanna-Attisha et al., 2016; Masten et al., 2016; Zahran et al., 2018; Zahran et al., 2017). The crisis created a wide variety of public health threats that impacted the entire community. Finally, because water is a universal need, residents of all genders, with/out children, and other demographics were impacted by this crisis and their informational needs were likely similarly distributed.

There were notable difference among genders in their media uses. Women, for instance, utilized Facebook and Instagram more than men to seek out current information about the crisis. Regarding *general* social media use, women tend to use these platforms at higher rates than men (Pew Research Center, 2019). Yet, less is known about patterns of use related to newer social media—like Instagram—for seeking information during crises. In particular, scholars have suggested that Instagram may aid crisis communication efforts due to its growing popularity, its large user base with over one billion monthly active users, its ability to dialogically engage publics, and its ability to support visual imagery and graphics (Guidry et al., 2017; Instagram, 2019). Together, study results *and* general social media use trends suggest that Facebook

and Instagram may be suitable outlets for crisis communication, especially when attempting to reach individuals who identify as a woman.

Social media continue to grow in popularity as places for individuals to gather and share crisis-related information. People use social media to gather personal information and check in with family/friends during a crisis, whereas legacy mass media are historically associated with educational uses and sources for information confirmation (Austin et al., 2012; Jurgens & Helsloot, 2018; Sellnow & Seeger, 2013). As there were high levels of distrust toward public officials and governmental agencies in Flint (Morckel & Terzano, 2018), residents may have turned to non-governmental or non-traditional sources, such as those available on social media. It is extremely important to consider how perceptions of public officials and governmental agencies may have impacted respondents' media uses, informational needs, and source preferences. Extant research, along with results from this study, suggests that practitioners consider affected populations' perception(s) of public officials and governmental agencies when crafting and disseminating crisis communication. Some crisis-affected publics may be hesitant to seek information from government-associated sources due to distrust in these entities. In Flint, distrust toward government officials and agencies likely influenced residents' media uses, informational needs, and source preferences.

Early in Flint's crisis, government officials denied and ignored residents' concerns about the water. According to some reports, officials withheld information from the public which likely evoked distrust in official messages about the water crisis (Morckel & Terzano, 2018). In Flint, distrust even broadened to include the scientific community and nongovernmental experts (Carrera et al., 2019). Thus, distrust in official crisis communication could have impacted respondents' media uses, informational needs, and source preferences. In fact, the Michigan Civil Rights Commission (MCRC, 2017) alleged the presence and role of systemic racism within Flint's crisis, the crisis response, and crisis recovery efforts. The MCRC report could have further promoted low levels of trust in government officials, especially as Flint's population is primarily Black/African American and most residents live at or below the federal poverty line (U.S. Census Bureau, n.d., 2010). Making

this situation even more problematic is that people living in poverty, female-headed households, and ethnic and racial minorities are considered vulnerable populations (De Chesnay & Anderson, 2016; Nsiah-Kumi, 2008; Spence & Lachlan, 2016). Vulnerable groups are more susceptible to the adverse effects of crises. To clarify, vulnerability is:

the result of several factors, including physical proximity to a risk, individual characteristics such as education, financial assets, constraints, physical abilities, and choices made by an individual. It involves both environmental and social components such as structural issues, gender, race, socioeconomic status, occupation, resources, social dependence, and social networks. (Spence & Lachlan, 2016, p. 215)

Vulnerable populations make up a significant portion of Flint's demographic. Thus, understanding their media uses, informational needs, and source preferences is critical to constructing effective crisis communication. It has been suggested that race may influence informational needs and source preferences surrounding the Flint water crisis. Specifically, extant research has suggested that Black/African Americans' media uses, informational needs, and source preferences differed from other racial groups within the context of Flint's crisis (Day et al., 2019). Trust also plays an important role in crisis communication, especially among vulnerable populations that have been systemically disadvantaged and mistreated, like much of the population in Flint (MCRC, 2017).

Trust is linked to source credibility and message consistency. Trust, source credibility, and message consistency impact message reception and the likelihood of an individual enacting protective actions (Drottz-Sjöberg, 2000; Maeda & Miyahara, 2003; Nsiah-Kumi, 2008; Richards et al., 2015). With low levels of trust, source credibility, and message consistency in the ecological context of Flint's crisis, it is possible that respondents modified their "typical" media uses and source preferences to meet their informational needs surrounding the crisis context, which supports propositions advanced by UGT (Katz, Blumler, & Gurevitch, 1974; Katz, Haas, & Gurevitch, 1973). Simply, distrust is a major inhibitor to crisis and risk communication. When crisis-affected individuals do not trust government officials who are handling the crisis,

important messages about protective actions may be ignored, misinterpreted, or questioned (Cordasco et al., 2007; Wachinger et al., 2013). Context and the local perspective are crucial to consider during crises (Sellnow & Seeger, 2013), especially as Flint has a unique demographic makeup and complicated history as related to race and economics (MCRC, 2017; Morckel & Terzano, 2018).

Nearly 30% of Flint's population is under the age of 18 and living with a parent or guardian (U.S. Census Bureau, n.d.). Lead contamination and subsequent bacterial contamination—like those documented in Flint's water crisis—are associated with long-term, serious health issues in children and adolescents, such as developmental delays and behavior issues like attention deficit/hyperactivity disorder (Hanna-Attisha et al., 2016; Zahran et al., 2017). These serious crisis-related health implications are prominent reasons why crisis-affected individuals' media uses, informational needs, and source preferences must be understood. Such knowledge is imperative to ensuring that crisis communication is effective and relevant to affected publics.

Limitations

This project is subject to several limitations. First, the sample for this study, although random, is not entirely representative of Flint's population (U.S. Census Bureau, n.d., 2010). The primary difference is with the representation of race (U.S. Census Bureau, n.d.). While the City of Flint is 53.9% Black or African American, the sample for this study was 35.6% Black or African American and had overrepresentation of White residents when compared to U.S. Census Bureau (n.d.) data (see Table 1C). A possible reason that there is underrepresentation of Black/African American individuals in this study may be due to the sampling sites and time of day (i.e., during traditional work hours). The water distribution sites were set up like "drive-thrus," which required the use of a vehicle (Flint Cares, 2016). The city was mandated to arrange water delivery for residents that could not pick up water at the distribution sites and neighbors may have picked up water for one another too (Kennedy, 2016). Another reason that the sample may lack representativeness is due to the random, in-the-field sampling procedure, which utilized RTNs.

The validity of the survey questionnaire is another important limitation to acknowledge. The questionnaire has not been formally tested, though it has been used in several other studies with similar results, suggesting its reliability (Day et al., 2019; Procopio & Procopio, 2007; Spence et al., 2011; Spence, Lachlan, & Griffin, 2007; Spence et al., 2006; Spence et al., 2005). Questions about validity are partially addressed through the survey's reference to communication processes and channels that have clear referents, such as "face-to-face conversation," "Facebook," and so forth. The survey instrument's validity and reliability, however, should be addressed in future research.

Another limitation of this study involves the way gender was measured as a binary construct. Though crisis-focused research has traditionally measured gender as a binary construct (e.g., Lachlan, Spence, & Seeger, 2009; Sheldon & Antony, 2018; Spence et al., 2006; Xie et al., 2017), this is not representative of how gender identities are increasingly reflected in society. Moving forward, crisis and risk-related research should allow participants to identify their gender in an open-ended response format when completing surveys to more accurately reflect the fluid nature of gender identity. In ways, this study also represents women as primary caregivers due to the high rate of single mothers in Flint, Michigan (County Health Rankings, 2019; Mack, 2017); however, this assumption should be considered a limitation of this study and carefully considered when interpreting results. While in some contexts, women may serve as principle caregivers to children, this is highly contextual and changing. To help alleviate limitations related to gender, future research should consider the crisis-related informational needs of caregivers/parents of children in general, regardless of their biological relationship to the child.

Finally, several limitations are associated with the context of the investigation. The Flint crisis was highly politicized and collecting data in a timely manner did not allow for control over all variables. High levels of distrust, ongoing issues of social justice, history of environmental racism, and high rates of poverty—although not the focus of this investigation—cannot be discounted (MCRC, 2017; Robinson et al., 2018). Although collecting data within the context of an actual crisis event is challenging, studies such as this

one can provide important insights that are garnered from *affected publics* versus that of experimental designs or hypothetical crisis scenarios that sample from student populations.

Conclusion

Communication plays a central role in managing crises. As water-related risks and crises are projected to increase in frequency in the near future (Centers for Disease Control and Prevention [CDC], 2016; Masten et al., 2016), crisis communication will become even more important. However, in the case of Flint's water crisis, it can be argued that the lack of trustworthy and timely crisis communication prompted respondents to utilize specific media and sources in an attempt to gratify their informational needs. Surprisingly, gender and whether or not respondents had children was not significantly related to respondents' desire to receive *future* crisis-related health information. There were, however, some notable differences in respondents' media uses. As related to future research and praxis, these results should be interpreted cautiously especially since Flint's crisis is context-dependent, complex, and exacerbated by systemic issues. Although this study offers some perspective into the dynamics of crisis-related media uses, informational needs, and source preferences, future research is needed to address the contextual, communicative exigencies of crisis-affected publics.

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