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Does compassion go viral? Social media, caring, and the Fort McMurray wildfire

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ABSTRACT

In May 2016, an enormous wildfire threatened the city of Fort McMurray, Alberta and forced the evacuation of all of the city's residents. Outpourings of support teemed in from all across Canada and over the world, prompting the largest charitable response in Canadian Red Cross history. This paper examines Albertans' response to the wildfire by exploring caring and helping behaviors as well as the role of social media in facilitating these remarkable charitable efforts. The paper uses mixed methods including an analysis of the most popular Tweets related to the wildfire and an Alberta survey collected months after the disaster. The analysis of tweets reveals that care, concern, and invitations to help were prominent in social media discourse about the wildfire. The analysis of survey data demonstrates that those who followed news about the wildfire on social media express higher overall levels of care and concern for those affected, which led to helping those impacted by the wildfire. The findings provide important insights about the role of social media in disaster relief and recovery as well as citizens' civic engagement.

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Introduction

On 3 May 2016, 90,000 residents of Fort McMurray, Alberta fled their homes with little notice, as a wildfire burned out of control and threatened the city. The fire also forced the evacuation of First Nation and Métis communities in and around the Fort McMurray region, which is located in the northwestern part of Canada. People posted messages and photos on social media illuminating the struggle to flee as the wildfire burned across the few major roadways connecting this city to other municipalities. Government and disaster management groups also used social media to communicate about where to take shelter; updates that changed hourly as the wildfire burned toward assigned shelters. News media used Twitter and other social media to provide updates on evacuation efforts. The wildfire was the biggest story of 2016 in Canada according to the news media (Krugel, 2016) and public opinion polls (Minsky, 2016). In the weeks after the fire, Canadians broke records in their outpouring of support for those impacted by the wildfire. The Fort McMurray

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wildfire of 2016 activated the largest charitable response in Canadian Red Cross post-war history, with over a million Canadians donating over \$136 million in funds (CBC, 2016). The Alberta Wildfire Donation Centre sent over 850 pallets worth of donations to Fort McMurray (Clancy, 2016). What lessons can we learn about human caring, community involvement, and how we engage with each other in our mediated and material world?

This paper examines how people express caring through social media, how social media use impacts care, and finally how social media use and care translate into helping behavior. To study these questions, we use original survey data ($n = 1208$) gathered two months after the 2016 wildfire and an analysis of Twitter data ($n = 15,000$) collected one month after the event. Specifically, this paper examines the most popular tweets related to the wildfire, illustrating recurring themes about care, invitations to help, and recognition of the charitable responses of others. Using social media encourages care and concern for those impacted by the wildfire, leading to charitable responses. The research challenges popular depictions of disaster in media. In disaster management and relief, social media differs in its use and impact, compared to traditional media. The research advances understanding about the social-psychological mechanisms by which helping takes shape during community disasters and the role of social media in disaster relief. The research addresses a clear gap in the field of social media use and engagement in civic and political life.

Caring, concern, and disaster: what is the role of social media?

Media coverage of disasters

Popular depictions of disasters on television and in movies fuel ongoing notions that disasters trigger panic (at best) or prompt widespread anti-social behavior (at worst). These popular depictions turn disasters into a media spectacle, viewed out of both fascination and for pleasure (Gotham, 2007; Recuber, 2013). After disasters, media coverage focuses heavily on the anti-social aspects of public response, such as looting, violence, and rioting; coverage that both spreads misinformation and delays response and recovery (Tierney, Bevc, & Kuligowski, 2006). The vast majority of the time, however, this narrative and the misleading perceptions it provokes are false. Tierney (2007) calls the perpetuation of the disaster-provokes-disorder frame as ‘the disaster mythology,’ as it is the most durable and prevailing understanding of human response to a catastrophe.

How do people actually respond to disasters? As Drabek (1986) first argued disasters provide a ‘strategic research site’ for better understanding the conditions under which organizations, institutions, and value systems emerge and change. This strain of disaster social science teaches us that, on the whole, affected people and those in surrounding areas engage largely in pro-social behavior (Dynes, 2006; Rodríguez, Trainor, & Quarantelli, 2006); they care for others, volunteer, donate money, and otherwise support those in struggle. People also create new, emergent social network ties and organizations aid in the disaster response and recovery (Murphy, 2007), leaving the post-disaster community stronger, in many ways, than the pre-disaster community – a place that Solnit (2010) calls ‘a paradise built in hell.’ In short, altruism and care-work are defining features of disasters. A missing thread within this growing disaster literature, however, is the extent to which social media affects people’s ability to display pro-social and caring behavior.

Social media and caring

The literature on donating and media use requires some re-thinking to examine how social media operates in a different context and has unique characteristics compared to traditional media. In international disasters, print and television news coverage are critical to raising awareness (Bekkers & Wiepking, 2011; Martin, 2013b; Murthy & Longwell, 2013; Oosterhof, Heuvelman, & Peters, 2009) and subsequently to donating to relief efforts (Adams, 1986; Brown & Minty, 2008; Feeny & Clarke, 2007; Martin, 2013a, 2013b; Simon, 1997; Waters & Tindall, 2011). Social media is different, because the news can arrive directly from victims of disasters and the victims are more easily identifiable as members of one's social network. Social media is also distinctive in the circulation of requests for assistance and in the recognition of pro-social behaviors, which create a social norm of giving.

Murthy and Longwell (2013) describe how social media can be used to provide coverage of a disaster before news media arrive. On social media, victims of disasters can share their personal stories providing first-hand accounts, rather than mediated accounts, of the need for support (Houston et al., 2015; Murthy & Longwell, 2013). As an example from 2017's Hurricane Harvey, social media was filled with postings from victims requesting help as well as needing help, including elderly residents in a flooded nursing home (Rhodan, 2017). This personal storytelling may resonate with the broader public, which may increase their feelings of empathy for those affected, which in turn could lead to helping behavior. In addition, social media effects may be different because the news about disasters arrives from and may involve members of one's social network. Many studies demonstrate that knowing a victim or person in need increases the likelihood of donating to a charity related to that cause (Bekkers & Wiepking, 2011). For example, people with family members suffering from a disease are more likely to donate to charities related to those diseases (Burgoyne, Young, & Walker, 2005).

Social media is also critical to solicitation. Social network members can initiate pleas for donations to charities, they can re-circulate solicitations from civic organizations, as well as crowdsource funding for their own needs (Saxton & Wang, 2014). For example, Pew data show that in the Haiti earthquake in 2010 almost 43% of donors encouraged family and friends to donate; 21% made this plea through social media (Smith, 2012). Social media can create a social norm of giving to charity (Einolf, 2011). Studies show that social norms are particularly effective in networks where people know each other and care about their reputation (Bekkers & Wiepking, 2011; Einolf, 2011). As such, Facebook and other social media networks can be particularly effective in creating norms of giving, but research has yet to demonstrate this process. Social media also provides opportunities to advertise one's donation, adding to reputation – a key mechanism predicting donations (Bekkers & Wiepking, 2011; Saxton & Wang, 2014; van Leeuwen & Wiepking, 2013). The circulation of invitations to help and the ability to recognize helping behavior can create a pro-social network of givers. Social media enables users to create and validate an identity of a good, 'caring citizen' who helps others, especially in times of need. For example, in the 2017 California wildfires, a video of a man saving a rabbit from the wildfire went viral on social media. The story was covered in traditional media in the USA (Holcombe, 2017), Canada (Frisk, 2017), and the United Kingdom (BBC, 2017). Disasters create scenarios in which people can enact caring and helping.

Altruism, values, and helping

One of the most highly studied areas of philanthropy research is the altruistic and pro-social values related to donating. Bekkers and Dursun (2013) estimate that there are more than 80 studies about the role of values and altruism in predicting donating. Two key concepts within this field of research are empathic concern and the principle of care. Empathic concern is the feeling of sympathy and compassion in response to others' need, whereas the principle of care relates to a moral duty to help others in need (Davis, 1994; Mesch, Brown, Moore, & Hayat, 2011; Paulin, Ferguson, Schattke, & Jost, 2014; Wilhelm & Bekkers, 2010). Using two datasets of nationally representative samples of Americans, Mesch et al. (2011) find that both care and concern predict giving to charity as well as the amount given. While this area has been given considerable attention, we would like to explore how people express care through social media, how social media use impacts care, and finally how social media use and care translate into helping behavior.

Case study

Our research examines the role of social media in the context of Albertans' response to the Fort McMurray wildfire. The research addresses a clear gap in existing literature and theorizing about social media effects on civic and political engagement (Boulianne, 2015, 2017). A current meta-analysis of this field of research identifies 133 cross-sectional survey studies assessing the correlation between social media use and participation in civic and political life (Boulianne, 2017). The research clearly establishes a positive relationship between social media use and activities such as protesting, volunteering, and voting. Indeed, social media effects may be stronger for civic engagement (e.g., volunteering and donating), than voting (Boulianne, 2015). However, compared to other forms of engagement, there is relatively little survey research focused on volunteering, donating, and other forms of assistance. Of the 12 studies examining social media and volunteering or donating, these studies suggest a positive association, but most of these studies are based on youth or student samples. Almost all of the studies offer generic measures (hours of social media use, volunteering in general), rather than event- or context-specific measures. Furthermore, this research is weak in testing the mechanisms through which social media translates into civic engagement. In contrast, the research on the role of social media and political participation points to intermediaries such as political interest, efficacy, and knowledge. Beyond survey work, social media research, in general, gives scant attention to crowdsourcing and fundraising with less than 1% of scholarship having this focus (Stoycheff, Wibowo, & Nanni, 2017).

The value of a context or event-specific study, like the present one, is that we can establish a clear connection between measures of social media use about the event and measures of helping in response as well as the content of social media discourse concerning the event. The specificity offered by a case study helps draw the theoretical connections between social media use, caring, and helping. Furthermore, this case study is valuable for offering insights about the role of social media use in disaster recovery, a largely unexplored topic in the existing literature. Martin (2013a) offers some insights into this topic related to the earthquake in Haiti, but the results are somewhat contradictory regarding whether social media use is statistically related to donating. This relationship requires

more scholarly attention and investigation. While we employ a case study approach, replicating existing work on media and donations in relation to disasters (e.g., Brown & Minty, 2008; Martin, 2013a; Simon, 1997), we believe that the theory and findings have broad implications. In particular, understanding how social media is different from traditional media helps illuminate the use of social media during Hurricane Harvey (2017) to request for assistance. The viral video of a man rescuing a rabbit from the California wildfire illustrates the compassion spurred by disasters and how social media can amplify this compassion. However, what is unique about our project is offering a systematic analysis of the role of social media in offering care and enabling care through donations, volunteering, and other forms of help in the period immediately after the disaster.

Methods

We used a mixed methods approach to study the role of social media in caring and helping in the context of the Fort McMurray wildfire. The first data source is an analysis of tweets using one of four hashtags: #FortMac, #ymm, #AlbertaStrong, and #FortMcMurray. While hashtags have been challenged as a sampling approach in big data analytics (Rafail, 2017), they are still one of the most common methods (Rafail, 2017) for capturing topic-specific data in Twitter (Larsson, 2017). These tweets were collected on 26 May 2016. The tweets were gathered using Ncapture, then subsequently imported into Nvivo for analysis. More than 15,000 tweets were identified using this approach. As described by other research (Larsson, 2017), the Twitter API permits access to 1% of tweets at that moment. Since the objective of this analysis was to provide insights into how social media was used in the context of the disaster, the tweets were analyzed to establish the most popular tweets, based on the number of retweets. While there are a variety of ways to establish tweet popularity, using retweet metrics is a well-established practice (Rafail, 2017; Rauchfleisch, Artho, Metag, Post, & Schäfer, 2017). Ideally, both Facebook and Twitter could be used for analysis; however, Facebook's API does not allow for such analysis.

Survey data enabled us to more fully examine the links between caring, social media use and disaster response. The University of Alberta's Population Research Laboratory conducts an annual survey called the Alberta Survey. The Alberta Survey works on a pay-per-question model where researchers propose and pay for questions for inclusion in the survey. The survey is a stratified (gender, region) random sample of 1208 Albertans. The data collection occurred between 5 July and 9 August 2016. The American Association of Public Opinion Research (AAPOR) Response Rate #1 is 7.69% (total of completes divided by total eligible phone numbers).

Why focus on Alberta? Geographical or social proximity between the donors and the recipients has been proposed as a key predictor of donating (Adams, 1986; van Leeuwen & Wiepking, 2013). In disasters, people often go to great personal sacrifice to help those close to them to evacuate or to find temporary housing. For these reasons, it is important to focus on Albertans' response to fellow Albertans. Fort McMurray is located in the northern region of the province, approximately 270 miles (434 km) north of Edmonton and 620 miles (1000 km) north of the US–Canada (Montana) border. About 40.1% of respondents personally knew someone displaced by the wildfire.

Table 1 includes basic descriptive statistics and question wording. We asked about participation in any effort to help residents or first responders related to

Table 1. Descriptive statistics for key variables.

	Min and max	Mean	s.d.	Valid N
Age in years	18; 95	52.27	16.39	1194
Female	1 = Yes; 0 = No	.500	n/a	1208
Married	1 = Yes; 0 = No	.673	n/a	1202
Bachelor's degree or higher	1 = Yes; 0 = No	.387	n/a	1208
Region	—	—	—	—
Calgary	1 = Yes; 0 = No	.333	n/a	1208
Edmonton	1 = Yes; 0 = No	.333	n/a	1208
Rest of Alberta (reference category)	1 = Yes; 0 = No	.333	n/a	1208
Religious identification	1 = Yes; 0 = No	.679	n/a	1163
Employed	1 = Yes; 0 = No	.612	n/a	1202
Total household income	—	—	—	—
\$0–\$50,000	1 = Yes; 0 = No	.153	n/a	1208
\$50,000–\$100,000 (ref. category)	1 = Yes; 0 = No	.226	n/a	1208
More than \$100,000	1 = Yes; 0 = No	.621	n/a	1208
Home owner	1 = Yes; 0 = No	.801	n/a	1195
In the past six months, have you used social media? (Social media includes Facebook, twitter, LinkedIn, Instagram, Tumblr, and Google+)	1 = Yes; 0 = No	.702	n/a	1208
Have you been using social media to follow the Fort McMurray wildfire? See text for description of recoding.	1 = Yes; 0 = No	.486	n/a	1208
Thinking about your family, co-workers, and close friends, do you personally know anyone displaced by the Fort McMurray wildfire?	1 = Yes; 0 = No	.401	n/a	1203
I care about others who live in Alberta.	1 = Very Strongly Disagree; 10 = Very Strongly Agree	9.03	1.48	1208
I am concerned for the people of Fort McMurray.	1 = Very Strongly Disagree; 10 = Very Strongly Agree	8.18	1.95	1204
Have you been involved in any effort to help residents or first responders related to the Fort McMurray wildfire?	1 = Yes; 0 = No	.292	n/a	1207

the wildfire. Typically, disaster research focuses on donating to charitable organizations, which makes sense in the study of international relief efforts. However, this disaster was within the province, allowing respondents to be directly engaged in voluntary efforts to help. In this specific disaster, the types of helping included volunteering for and donating to the Canadian Red Cross, but also included a variety of citizen-led initiatives, such as organizing fundraising barbecues, providing free veterinary services, donating clothing, and bringing fuel to motorists stranded on the highway between Fort McMurray and the nearest gas station. Each of the citizen-led initiatives involved donating both time and money, blurring the distinction between volunteering and donating. As such, we operationalized our dependent variable as *participating in any effort to help*. We found that 29.25% of respondents participated in some effort to help.

Level of care for other Albertans (average of 9.03 on a 10-point scale) and concern for Fort McMurray residents (average of 8.18 on a 10-point scale) were very high. Approximately 70.2% of respondents had used social media in the last six months. This subset of respondents ($n = 848$) was asked about specific uses of social media. Within this subset, approximately 69.2% used this tool to follow the Fort McMurray wildfire. Those who had not used social media in the last six months ($n = 360$) were coded as 'no' and were retained in the subsequent analysis. Including the full sample, we estimate that 48.6% of respondents ($n = 1208$) had used social media to follow the Fort McMurray wildfire.

Results

Table 2 outlines the most popular tweets during the one month period after the disaster. The 20 tweets in Table 2 clearly demonstrate themes of care, concern, and help. For example, the Mayor of Edmonton, a city hosting the bulk of displaced residents, outlines how citizens can help their fellow Albertans displaced by the wildfire. The Canadian Red Cross is prominent in these tweets, highlighting their role in gathering donations as well as in recognizing the helping efforts of others. One of the most popular tweets was recognizing Selena Gomez for donating some of the proceeds of her upcoming concerts in Alberta to the Canadian Red Cross to support wildfire victims. Celebrities used Twitter to express care and concern for displaced residents (see the tweet from Tim McGraw). Lastly, we see displaced victims using Twitter to provide pictures of the harrowing evacuation process. Indeed, the most popular tweet, based on retweets, was a Fort McMurray resident's post, @jstuffcocrimlaw, describing and showing pictures about his efforts to evacuate. While the resident had relatively few followers (508), his message was retweeted 5429 times! The analysis of tweets reveals themes of caring, helping, and the recognition of charitable efforts related to the Fort McMurray wildfire.

Table 3 presents two ordinary least squares regression models of two different dependent variables: (1) Care for Albertans; (2) Concern about Fort McMurray fire victims. We found that using social media to follow the wildfire is positively ($b = .397, p < .001$) related

Table 2. Popular tweets related to the Fort McMurray wildfire.

Username, type of user	Tweet	Number of retweets	Number of followers
Redcrosscanada, Nonprofit	#FortMcMurray wildfire: How Canadians can help: https://t.co/JMm0iR7N9e – @globalnews #ABfire	355	129,052
Barbi_Twins, Celebrity	SOS #FortMcMurray #Alberta FIRE #pets @EdmontonHumane @AlbertaSPCA @llbrhs @DisasterAnimals https://t.co/flWxZ6bdSD https://t.co/flWxZ6bdSD https://t.co/flWxZ6bdSD https://t.co/flWxZ6bdSD	374	32,598
Doniveson, Mayor of Edmonton	For those looking for ways to take action and support our friends in #FortMcMurray affected by #YMMfire, donate here https://t.co/...	412	84,209
FullFrontalSamB, Celebrity	The Canadian Red Cross has a page to help evacuees from the terrible #FortMcMurray wildfire. RT, donate if you can: ht ...	515	94,970
BlueJays, Sports Team	Help support those affected by the fires in #FortMcMurray by texting FIRES to 45678 to make a \$10 donation or visit redcross. ...	638	1,395,664
TheoMoudakis, News Media	'Superheroes' is Tuesday's #FortMcMurray cartoon in @TorontoStar https://t.co/Gv2sjObqSY	705	2650
CBCAlerts, News Media	#Alberta gov't will match dollar-for-dollar donations made @redcrosscanada for #FortMcMurray. #ymmfire #FortMacFire	742	800,901
PatriceRoyTJ, News Media	#FortMcMurray – Une vision d'apocalypse. Des images tournées par Michel Chamberland, qui tente de fuir les lieux. https://t.co/...	745	60,024
TheTimMcGraw, Celebrity	Thoughts and prayers go out to everyone affected by the wildfires. #AlbertaStrong Stay safe everyone!	778	2,284,617
Juliamacfarlane, News Media	Stunning Reuters image of the red glow of the Canada wild fire underneath the northern lights #FortMcMurray https://t.co/...	833	34,268
Redcrosscanada, Nonprofit	Thank you for supporting Canadians in #YMM @SelenaGomez!	4528	128,928
Jstuffcocrimlaw, Lawyer	My harrowing drive evacuating #ymm praying for my friends https://t.co/XGFWfavqR2	5429	508

Note: Analysis of tweets as of 26 May 2016. The four hashtags considered are #FortMac, #ymm, #AlbertaStrong, and #FortMcMurray.

Table 3. Ordinary least squares regression models of care and concern.

	(1) Care about others	(2) Concerned about residents
Age	−0.002 (0.004)	0.005 (0.005)
Female	0.480*** (0.086)	0.356** (0.114)
Married	0.142 (0.106)	−0.069 (0.140)
White	0.112 (0.117)	−0.391* (0.155)
Bachelor's or higher	0.106 (0.091)	0.123 (0.121)
Religious	0.306*** (0.096)	0.260* (0.126)
Income \$0 to \$50K	−0.195 (0.146)	−0.010 (0.194)
Income \$100K or higher	0.124 (0.106)	−0.202 (0.140)
Homeowner	0.133 (0.121)	0.007 (0.160)
Calgary	−0.239* (0.109)	−0.117 (0.144)
Edmonton	−0.149 (0.107)	−0.080 (0.142)
Employed	−0.129 (0.100)	−0.213 (0.133)
Household size	−0.048 (0.037)	0.004 (0.049)
Follow fire on social media	0.397*** (0.091)	0.632*** (0.120)
Constant	8.421*** (0.292)	7.895*** (0.385)
Observations	1,141	1,137
R^2	0.076	0.056

Note: Unstandardized slopes provided with standard error in parentheses.

*** $p < .001$.

** $p < .01$.

* $p < .05$.

to caring about others who live in Alberta. In the first column, it is noteworthy that gender is a significant predictor of care, whereby women score about half of a point higher on the scale than men, all else equal. Similarly, those who are religious score higher than those who are not. Those who live in Calgary report caring about fellow Albertans less than those who live in the rest of Alberta and those who live in Edmonton.

The second column shifts the focus to self-reported level of concern for people impacted by the wildfire. Once again, women exhibit more concern than men, and those who are religious report higher concern than those who are not. Interestingly, those whose racial/ethnic identification is 'white' report less concern for those affected by the fire than non-whites. And, once again, the social media variable is significant, whereby those who followed the wildfire on social media report more concern than those who did not ($b = .632$, $p < .001$). As observed with care, using social media to follow the wildfire is positively related to concern about residents of Fort McMurray.

Table 4 shifts the analysis to examine whether surveyed Albertans knew somebody affected by the wildfire (coded as No = 0; Yes = 1). In particular, did Albertans who were social media users (in general) have a greater likelihood of knowing somebody

Table 4. Logistic regression model of knowing someone affected by the wildfire.

Age	0.998 (0.005)
Female	1.216 (0.152)
Married	1.344 (0.210)
White	1.103 (0.189)
Bachelor's or higher	1.260 (0.167)
Religious	1.098 (0.153)
Income \$0 to \$50K	0.832 (0.181)
Income \$100 K or Higher	1.017 (0.156)
Homeowner	1.238 (0.223)
Calgary	0.640** (0.102)
Edmonton	0.939 (0.144)
Employed	1.096 (0.161)
Household size	0.955 (0.052)
Uses social media	1.516*** (0.228)
Constant	0.353* (0.155)
Observations	1,136
Pseudo R ²	0.0255

Note: Odds ratios (e^b) provided with standard error in parentheses.

*** $p < .001$.

** $p < .01$.

* $p < .05$.

affected by the wildfire? Did social media help them identify victims within their social network? Results from the logistic regression model in Table 4 indicate that those who have used social media in the past six months are about 1.5 times more likely to know somebody affected by the wildfire than those who have not, all else equal (odds ratio = 1.516, $p < .001$). Additionally, those in Calgary were some 36% less likely than those living in the remainder of Alberta to know someone affected by the wildfire. Geographically, Calgary is located in the southern section of the province, Edmonton is centrally located and Fort McMurray is in the northern section of the province, making Calgary residents the farthest removed from Fort McMurray.

Table 5 provides a logistic regression model, with odds ratios presented, of whether surveyed Albertans provided any help with regard to the wildfire (coded as No = 0; Yes = 1). The model indicates that those who are religious have higher odds of helping than those who are non-religious. The odds ratios at the bottom of the table indicate that those who followed the wildfire on social media were nearly twice (odds ratio = 1.639, $p < .001$) as likely to help as those who did not follow. Similarly, Albertans who knew somebody affected by the fire were more than twice (odds ratio = 2.233, $p < .001$) as likely to help as those who did not know someone. Care and concern are also both significant, whereby

Table 5. Logistic regression model of helping related to Fort McMurray wildfire.

	Help
Age	0.990 (0.006)
Female	0.850 (0.120)
Married	1.341 (0.234)
White	1.320 (0.255)
Bachelor's or higher	1.098 (0.160)
Religious	1.372* (0.219)
Income \$0 to \$50K	1.206 (0.293)
Income \$100K or higher	1.227 (0.214)
Homeowner	1.077 (0.216)
Calgary	1.016 (0.179)
Edmonton	1.134 (0.196)
Employed	0.962 (0.158)
Household size	0.909 (0.056)
Follow fire on social media	1.639*** (0.244)
Know anyone affected	2.233*** (0.311)
Concerned about residents	1.091* (0.046)
Care about others	1.202** (0.074)
Constant	0.019*** (0.014)
Observations	1,132
McFadden's pseudo R^2	0.0753

Note: Odds ratios (e^b) provided with standard error in parentheses.

*** $p < .001$.

** $p < .01$.

* $p < .05$.

higher levels of professed care for fellow Albertans (odds ratio = 1.202, $p < .01$) and more concern for those affected by the fire (odds ratio = 1.091, $p < .05$) are associated with higher odds of helping. In sum, our survey reveals that knowing someone affected by the wildfire, using social media use to follow the wildfire, caring about others, and being concerned for Fort McMurray residents all have independent and positive effects on helping in relation to the wildfire.

Discussion

Does compassion go viral? In our discussion we address this important question and explore the implications of our findings. While we do not deny that social media can produce hostile discourses, bullying, and other dire outcomes, our research shows that social

media can also produce positive outcomes, and can serve as a conduit for care and concern. In the case of the Fort McMurray wildfire, an analysis of Twitter data illustrates themes of care and concern regarding those displaced by the wildfire. The most popular messages on Twitter were those expressing support, recognizing charitable efforts and invitations to help those in need. These messages point to a 'spirit of care' related to this disaster.

Our survey data suggest that using social media to follow the wildfire translated into a greater likelihood of helping (i.e., donating, volunteering, or acting to care for those affected by the fire). This is consistent with research on traditional media use and donating to international disasters (Adams, 1986; Brown & Minty, 2008; Feeny & Clarke, 2007; Martin, 2013a, 2013b; Simon, 1997; Waters & Tindall, 2011). In other words, when a tweet goes viral, it has the power to create real caring acts – which is vital and impactful in times of disaster. Following the wildfire on social media encouraged Albertans to help in concrete and immediate ways. This is consistent with the existing literature suggesting a positive correlation between social media use and civic engagement (Boulianne, 2015, 2017). This study is distinctive in highlighting the mechanisms through which social media engagement translates into demonstrated action to lend support. These mechanisms – knowing someone directly affected, caring about Albertans, and feeling concern for those affected – mediate the relationship between social media use and charitable responses. Ideally, we would use multi-wave panel data to assess these causal pathways linking media use and engagement as well as to specify the causal ordering of key variables (e.g., Boulianne, 2011). However, such data are nearly impossible to collect in the context of disasters which happen unexpectedly.

Our research challenges existing frames of disaster-provokes-disorder (Tierney, 2007) and instead offers a frame that disaster-prompts-care. The systematic analysis of Twitter data and correlations observed in survey research demonstrate that disaster prompts care. This supplements the anecdotal evidence offered about disasters prompting care, as observed in the rabbit rescue in the 2017 California wildfire. In other words, in disasters, affected people and those in surrounding areas engage largely in pro-social behavior (Dynes, 2006; Rodríguez et al., 2006); they care for others, volunteer, donate money, and otherwise support those affected. In addition, in contrast to media depictions of disasters in terms of panic and anti-social behavior, we reveal the role of social media in promoting pro-social behavior – helping, recognizing others' help, and expression of care and concern. Contrary to cynical views that social media engagement fuels disconnection – even hatred – we found promise in social media technologies to create social bonds and humanize relationships such that members of the Alberta community demonstrated care for each other.

The combination of Twitter data analysis with survey data suggests that this 'spirit of care' had an impact. Following the wildfire on social media increased levels of care and concern (i.e., empathy or compassion for disaster victims). These findings point to the emergence of a spirit of care in the aftermath of the Fort McMurray fire, and suggest that this caring spirit is facilitated at least to some degree through social media. This spirit of care is exemplified in the analysis of popular Tweets related to the wildfire and supported with survey data with strong associations between social media use and care and concern.

In the context of disaster, social media requires re-thinking of the role of media. Social media is clearly different from traditional media. Traditional media's role in international disasters points to raising awareness, which leads to donations (e.g., Martin, 2013a, 2013b). Social media offers first-hand accounts from victims of disaster, rather than the mediated accounts offered by traditional media. Social media is also distinctive in its ability to re-circulate messages of care and concern, as well as requests for volunteers and donations. Social media can help others recognize the faces of those in need, which can prompt charitable responses (Bekkers & Wiepking, 2011). Unlike traditional media, social media can create a 'spirit of care' in the face of community disaster.

Social media plays an important role in recognizing charitable responses. After donating, a donor is often prompted to post a message about their donation to social media, such as Facebook, encouraging others to follow their example. In this way, social media can prompt a norm of giving among social network members. In addition, as the Twitter data illustrate, social media can be used by civic organizations to recognize donors' contributions.

Future research should explore the more nuanced and intricate ways networks of care and support emerge and are (re)produced on and off-line during and in the aftermath of disasters. In part, a disaster is defined by the need for external assistance where crisis response is not limited to formal institutional mechanisms of support. After the burning stops or the tides retire, communities affected by disaster need help rebuilding long after the hashtags are no longer trending on Twitter and Facebook. Social media may create ties that can be mobilized toward long-term efforts to rebuild the disaster-affected communities.

Another line of research on networks would be to look at platform-specific effects (Boulianne, 2017). The survey data suggests that social networks are important, but the data do not capture how people are using social media to connect with those directly impacted by disaster and the organizations delivering disaster relief. The exclusive use of Twitter data, as opposed to Facebook data, limits the analysis of these friendship networks and their impact on caring, concern, and helping. Facebook is largely used to create and support interpersonal communication (Stoycheff et al., 2017). In contrast, Twitter may be helpful for the formation of formal ties with organizations and create diffuse network ties to help the diffusion of information about disasters and relief efforts. Further research should examine platform-specific effects, more nuanced network effects, and finally the long-term effects of social media in rebuilding communities.

In recent years, Alberta has become Canada's disaster capital. In fact, three of the five costliest disasters in Canadian history (2011 Slave Lake fire, 2013 Southern Alberta Flood, 2016 Fort McMurray Fire) have all occurred in Alberta – and all within the last six years (Haney & McDonald-Harker, 2017). If catastrophe continues to befall Albertans, the networks of care and support forged during these recent events could provide a stable foundation to help and support those affected by Alberta's future disasters. Research of this kind is timely and necessary. However, Alberta is not alone in facing disasters; as the global climate changes, our vulnerabilities to such disasters increase (United Nations, 2015). While we used a case study approach, we argue that the theory and findings have implications on other disasters. The 2017 California wildfires have also, anecdotally, demonstrated people's capacity for care and help in times of disaster (BBC, 2017; Frisk, 2017; Holcombe, 2017). Social media use during Hurricane Harvey demonstrated the capacity

of this media to circulate requests for help during disaster (Rhodan, 2017). Furthermore, social media was critical in disaster management in 2017's Hurricane Irma, as relief organizations used this tool to provide regular updates (MacMillan, 2017). Given the increasing frequency of these disasters, how people use innovative social media technologies to respond to, and recover from, disaster will increase in importance. Our research provides insights that can help relief organizations, volunteers and affected community members to respond to and recover from disaster.

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