

Effectiveness of Social Media in Disaster Fundraising: Mobilizing the Public towards Voluntary Actions

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ABSTRACT

When a disaster strikes, nonprofit organizations face the need to mobilize resources as quickly as possible in a limited time frame. Given its characteristics to instantly spread information to masses of people, social media is considered one of the most effective ways for nonprofits to publicize opportunities to take voluntary actions. Despite the envisioned use, however, little has been examined about the effectiveness of social media in encouraging people to give. This paper takes the case of earthquake, tsunami, and nuclear threat that struck Japan in 2011 to examine whether the use of social media was effective in nonprofit fundraising. Analyzing data collected in an original online survey, the authors find that the use of social media both *before* and *after* the disaster has a positive impact on the amount of donations that nonprofits raise.

KEYWORDS

Disaster, Donation, Facebook, Fundraising, Japan, Nonprofit Organizations, Social Media, Twitter, Voluntary Actions

1. INTRODUCTION

Nonprofit organizations today are one of the key actors in disaster relief, response, and reconstruction (Kapucu *et al.*, 2011). Not only are they active as first responders, but also as essential organizations that facilitate recovery while working closely with organizations in both public and private sectors (Kapucu, 2007).

Disasters are times when nonprofit organizations face the need to mobilize resources as quickly as possible in a limited time frame. Once an organization decides to engage in response activities, the nonprofit uses multiple communication channels to send out information to mobilize the people toward voluntary actions. These opportunities to make financial donations, in-kind giving, and/or to volunteer, become chances for people who are willing to help those suffering from the tragedy. Solnit (2009) described the emergence of such highly motivated population as “A Paradise Built in Hell.” Nonprofit organizations play an important role of providing an opportunity to transform the desire of these people into actual actions (Okada & Yamauchi, 2014).

Given its characteristics to instantly spread information to masses of people, social media is considered one of the most effective ways for nonprofit organizations to publicize opportunities of voluntary actions in critical situations. Social media refers to “interactive online technologies and practices that people use to share opinions, insights, experiences, and perspectives with each other”

DOI: 10.4018/IJPADA.2017010104

(Haddow & Haddow, 2014, p.242). Examples include Facebook, Twitter, and YouTube, just to name a few. Mayfield (2006) sees participation, openness, conversation, community, and connectedness as key features that distinguish social media from traditional media.

Despite the envisioned use, little has been documented about how nonprofit organizations use social media in times of disasters to mobilize the public towards voluntary actions. Much less known is whether the use of social media is effective in encouraging people to give or to volunteer. In this paper, we take the case of earthquake, tsunami, and nuclear threat that struck Japan in 2011 to examine the effectiveness of social media in nonprofit fundraising. To what extent did nonprofits use social media to mobilize the public towards voluntary actions? Did the use of social media change overtime from response to recovery phase? More importantly, was the use of social media effective in encouraging people to make financial contributions? We analyze these questions using an original data collected through an online survey.

2. SOCIAL MEDIA, DISASTERS, AND NONPROFITS

As an emerging new tool, social media has attracted much attention in both disaster studies and nonprofit studies. In this section, we review the literature in these bodies of work and highlight our contributions.

2.1. Social Media in Disaster Studies

Literature on disasters have explored wide range of possibilities that utilization of social media might bring about in disaster situations. Studies of crisis communication, in particular, highlight the potential use of social media in emergencies. Assuming the effectiveness of social media to share and spread information in the aftermath of disasters, both scholarship and practitioners have identified tips for its successful usage as part of organizational communication strategies (e.g. Haddow & Haddow, 2014; Veil *et al.*, 2011). Social media enable all types of organizations engaged in relief activities to put out information instantly to the public, therefore giving earliest possible warning and collecting the most up-to-date information from the ground. These new tools are also used to share information and to facilitate communication as well as collaboration among different types of organizations engaged in response activities (Gao *et al.*, 2011).

Studies also document and analyze the use of social media in actual cases of disasters. Researches conducted in Japan, for example, examine wide use of social media in the aftermath of the 2011 disaster (see Section 4 for the details of the disaster). Sekiya (2012) analyzed the purposes of Twitter use after the 2011 disaster. Kawai and Fujishiro (2013) analyzed how people used Twitter to obtain disaster-related information, and Yamamoto *et al.* (2012) examined the influence of Twitter use on people's perception of "safety" and "anxiety" following the disaster.

2.2. Social Media in Nonprofit Studies

Ever since the introduction of social media such as Facebook and Twitter, nonprofit organizations have looked into how they might adopt and utilize these tools. Given such trend, researchers have examined various ways for nonprofits to use social media. For example, Lovejoy and Saxton (2012) examined Twitter utilization among 100 largest nonprofit organizations in the United States and identified three types of Tweet functions: information, community (e.g. giving recognition and thanks, acknowledgment of current and local events), and action (e.g. promoting an event, donation appeal, selling a product, call for volunteers and employees, lobbying and advocacy, join another site or vote for organization, learn how to help). Svensson *et al.* (2014) particularly highlighted the use of social media for nonprofits to disseminate information, to build engagement, and to facilitate action. Briones *et al.* (2011) conducted a case study of American Red Cross to document the use of social media to build strong and lasting relationships with potential supporters.

Not all nonprofits are in favor of adopting and facilitating the use of social media. Studies have identified obstacles that prevent nonprofit organizations from utilizing these new tools. In the context of New Zealand, Zorn *et al.* (2013) found that nonprofits have limited familiarity with the use of social media. Size and complexity of the organization may hinder its adoption among nonprofits, as well as age-based digital divides (Eimhjellen *et al.*, 2013). Curtis *et al.*, (2010) further highlights that organizational structure, such as lack of independent public relations department, as potential obstacle. As Briones *et al.* (2011) notes, the obstacle may simply be lack of staff and time. Given these challenges, Nah and Saxton (2013) highlight the following key drivers of organizational adoption and use of social media: organizational strategies, capacities, governance features, and external environment. Waters *et al.* (2009) further discuss that careful planning is needed for effective use of social media in nonprofit organizations.

Once a nonprofit organization adopt social media as part of its communication strategy, the next question is to think about how best to utilize the new tools to achieve the goals. One tactic is to carefully select the content of information and frame them in a certain way, as shown Guo and Saxton (2014) on nonprofit advocacy. Auger (2014) went further to test what types of messages are effective. The study conducted a rhetorical analysis on Tweets made by nonprofits and found that positively frame messages tend to persuade supporters to take actions for the cause advanced by these organizations.

2.3. Nonprofits' Social Media Use in Disaster Contexts

In what ways can nonprofit organizations use social media when a disaster strikes? Studies in crisis communication encourage nonprofits to utilize these new communication channels as people today perceive social media as credible information source. For example, Austin, Liu, & Jin (2012) argue that during a crisis, people use social media for insider information and to check in with family and friends.

Studies suggest that using social media as a medium of communication may also bring benefits to nonprofit organizations. Schultz *et al.* (2011) found that use of social media enhances organizational reputation, encourage people to talk more about the crisis, and facilitate people's willingness to react to the crisis (e.g. to boycott). Confirming these findings, Utz *et al.* (2013) found that Facebook and Twitter increase an organization's reputation than traditional media. Social media also allows nonprofit organizations to communicate directly with the public, without going through interpretation of journalists in traditional media (Pavlik, 2001).

Studies also imply that nonprofits should not simply use social media, but be strategic about matching messages to the characteristics of particular media. Liu *et al.* (2011), for example, highlight the importance of strategically matching information form and source in responding to crisis. Strategies of media mix may also be the key to successful use of social media. Waters and Tindall (2011) highlight the importance of being strategic in using multiple communication tools such as mass media like televisions and newspapers. They analyzed charitable giving in response to the December 2004 Asian tsunami and found that media coverage impacted traditional giving, i.e. donations made directly to nonprofit organizations, as well as e-philanthropy through third party outlets such as Amazon.com and eBay auctions. They encourage nonprofit organizations to strategically use traditional mass media as well as digital media to approach the public.

2.4. Contribution of This Study

This study joins the body of literature looking at nonprofits' use of social media in disaster times while making two key contributions. First, we bring in the case of triple disasters of earthquake, tsunami, and nuclear threat that struck Japan in 2011. Little has been studied about nonprofits' use of social media in countries outside North American and European contexts. As we discuss in section 4, this particular disaster was the first large-scale disaster that Japan experienced with a wide-spread use of social media. We thus believe that the case is worth exploring in detail to draw implications for regions that face similar risks.

Second, we move beyond simple documentation of how nonprofits use social media, and statistically examine its effectiveness in encouraging people to give. Most studies that look into the effectiveness, as we discuss in the next section, is limited to case studies. We believe that findings from analysis using quantitative methodology will add to these rich set of descriptive studies.

3. USE OF SOCIAL MEDIA IN FUNDRAISING: HYPOTHESES

As noted above, nonprofit organizations use social media to achieve multiple purposes. Among them is fundraising, the focus of our paper. Upon a decision to engage in disaster relief and response, nonprofit organizations need to secure sufficient financial resources to pursue activities to achieve their goals.

To begin with, nonprofits today operate in an environment where securing financial resources and achieving financial stability is a huge challenge. Nonprofits face increasing demands for accountability while struggling through economic downturns and cuts in government funding (Burt & Taylor, 2003; Hackler & Saxton, 2007).

3.1. Hypotheses

How does using social media contribute to fundraising efforts of nonprofit organizations in times of disasters? In this section, we draw three hypotheses to test in the context of Japan from studies that examined the effectiveness of social media on disaster fundraising.

Several studies to date have found that social media use is *in general* effective. For example, a detailed case study by Brengarth *et al.* (2015) found Facebook to be a useful tool in selling T-shirts for donation during wildfire crisis. Similarly, Adler and Carpenter (2015) documented the effectiveness of Facebook in peer-to-peer fundraising campaign. Saxton and Wang (2014) explain that social network effect is what makes Facebook an effective tool for fundraising: “with the organisations’ fans reaching expanding circles of online friends in their own social networks, which ultimately increases charitable contributions (pp.862-863).” Therefore, nonprofit organizations perceive social media as effective tools for fundraising, as was shown in Muralidharan *et al.* (2011) focusing on the case of 2010 Haiti Earthquake. Given these findings, we draw the following hypothesis and test it using variables “use of Facebook/Twitter” in our dataset.

Hypothesis 1: Use of social media is effective in nonprofit fundraising in times of disasters.

Nonetheless, simply sending out information through social media may not allow the organization to use these innovative tools to its full potential. Being strategic about *when* to use social media is also a key in encouraging people to give. Our second and third hypothesis thus go beyond simple usage of social media to timing of such use. As was the case in the studies cited above, nonprofit organizations begin asking people to donate after a specific disaster has taken place. To meet the emerging needs and to take advantage of rising interests towards the disaster, nonprofit organizations would want to begin asking for donations immediately after the occurrence of the event. In the wildfire case, the first social media message to raise money was sent in less than 24 hours after the fire had surrounded houses (Brengarth *et al.*, 2015). Similarly, 82 percent of the nonprofits under study were using Facebook to seek for donations within two weeks after the initial shake in Haiti (Muralidharan *et al.*, 2011). We thus draw the following hypothesis, focusing on the variables labeled “use of Facebook/Twitter after 3.11.”

Hypothesis 2: Use of social media is effective in nonprofit fundraising when used *immediately after* the disaster.

A related hypothesis is on continuous use of social media *before* and *after* the disaster. One can assume that if a nonprofit had used Facebook/Twitter to encourage people to make donations, “friends”

or “followers” of the organizations may be educated before the disaster to take action immediately after the event. Saxton and Wang (2014) confirmed this point by proving the hypothesis that nonprofit organizations with more fans on Facebook receive more charitable contributions via social media. The fans themselves may not necessarily be a donor, but can serve as a fundraiser in engaging their networked friends to give. We test the following hypothesis three using variables labeled use of Facebook/Twitter before and after 3.11.

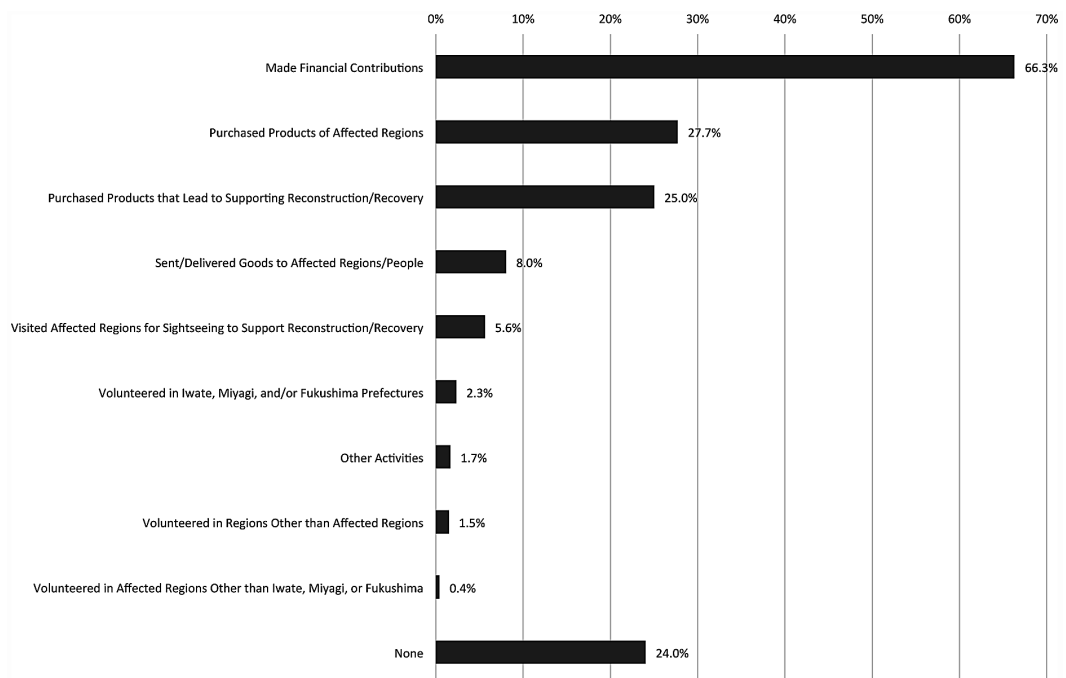
Hypothesis 3: Use of social media is effective in nonprofit fundraising when used continuously both *before* and *after* the disaster.

4. CONTEXT: 2011 JAPAN DISASTER

On March 11, 2011, a magnitude 9.0 earthquake struck off the coast of Northeastern Japan. This historic earthquake generated a series of tsunamis along a coastline of 450 km, reaching as high as 40.5 meters in some locations (Cabinet Office of Japan, 2011). These tsunamis triggered failure of reactors’ cooling system at Fukushima Daiichi Nuclear Power Plant, leading to a release of radioactive materials. These triple disasters that came to be known as the 2011 Japan disaster or 3.11, caused 15,891 deaths, and 2,579 missing as of April 10, 2015 (National Police Agency of Japan, 2015).

In response to the catastrophe, people all across Japan stood up to take voluntary actions for those suffering from the tragedy. A survey by the Japan NPO Research Association found that 75.6 percent of the respondents took some sort of voluntary actions including making donations, purchasing products of affected regions, sending/delivering goods to affected regions, and volunteering (see Figure 1). In another post-disaster survey by the Cabinet Office of Japan (2012), 59.5 percent of the respondents had taken some sort of voluntary actions in the aftermath of the 2011 triple disasters.

Figure 1. Voluntary actions taken in the aftermath of the 2011 disaster
 Source: Japan NPO Research Association (2012).



The irony of studying disasters is that we cannot assess or test what works and what doesn't until a disaster actually happens. Because the 2011 Tohoku disaster was the first large-scale disaster that Japan experienced with a wide-spread use of social media, we believe studying this case is worthwhile in drawing lessons for future disasters not only for Japan but also for other societies facing similar risks. Figure 2 shows the percentage of social media users as of March 2011. The result shows that at the time of the disaster, 75.2 percent of the respondents had access to social networking services such as mixi¹ and Facebook, and 50 percent to Twitter.

In the more recent years, the number of social media users are increasing constantly. According to the most recent survey by the Ministry of Internal Affairs and Communications (2014), 57.1 percent of the Japanese population today use social media including Facebook, Twitter, and LINE². Despite the image that social media are for younger generations, those in their 40s and 50s are also active social media users today (see Figure 3). Assuming that these conditions represent a global trend of expanding use of social media, we expect our findings to have implications for all nonprofit organizations with the possibility of facing crisis situations across the globe.

5. SURVEY DESIGN

In order to examine how nonprofit organizations used social media to mobilize the people towards voluntary actions after the 2011 Japan disasters, we developed a dataset collected through an original online survey. The objective of this survey was to understand how nonprofit organizations disseminated information about opportunities of voluntary actions³.

Target organizations were selected using a list of nonprofit organizations that made active response at the time of the disaster. We first developed a list of organizations participating in Japan Civil Network for Disaster Relief in the East Japan (JCN). JCN is "a broad coalition of Japanese NPOs, NGOs,

Figure 2. Percentage of social media users in March 2011

Source: Ministry of Internal Affairs and Communications (2011).

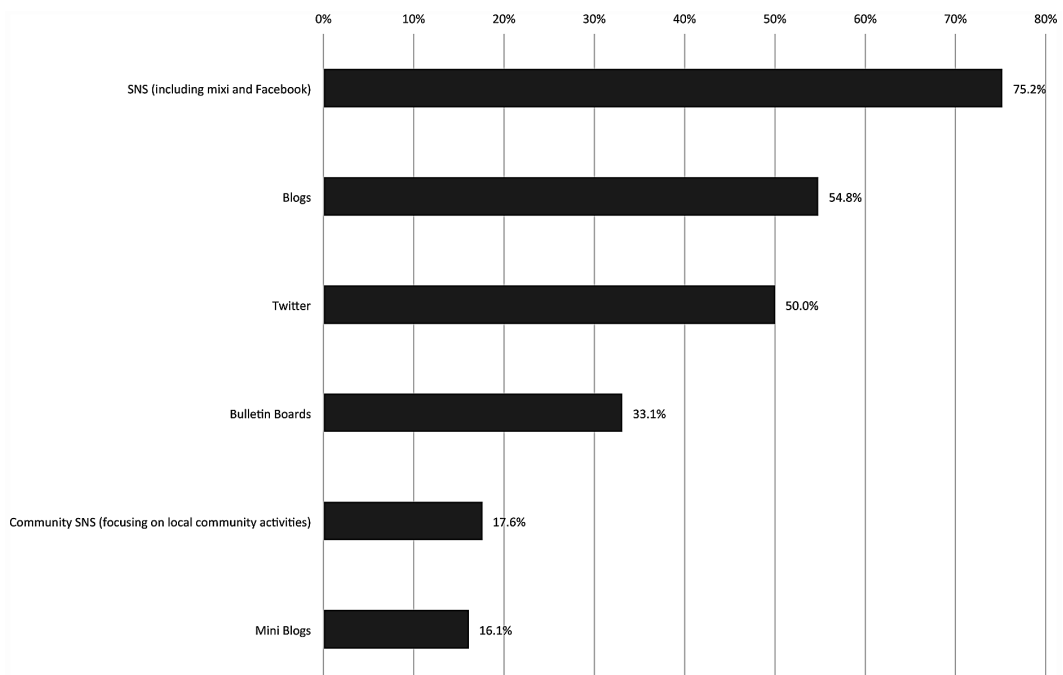
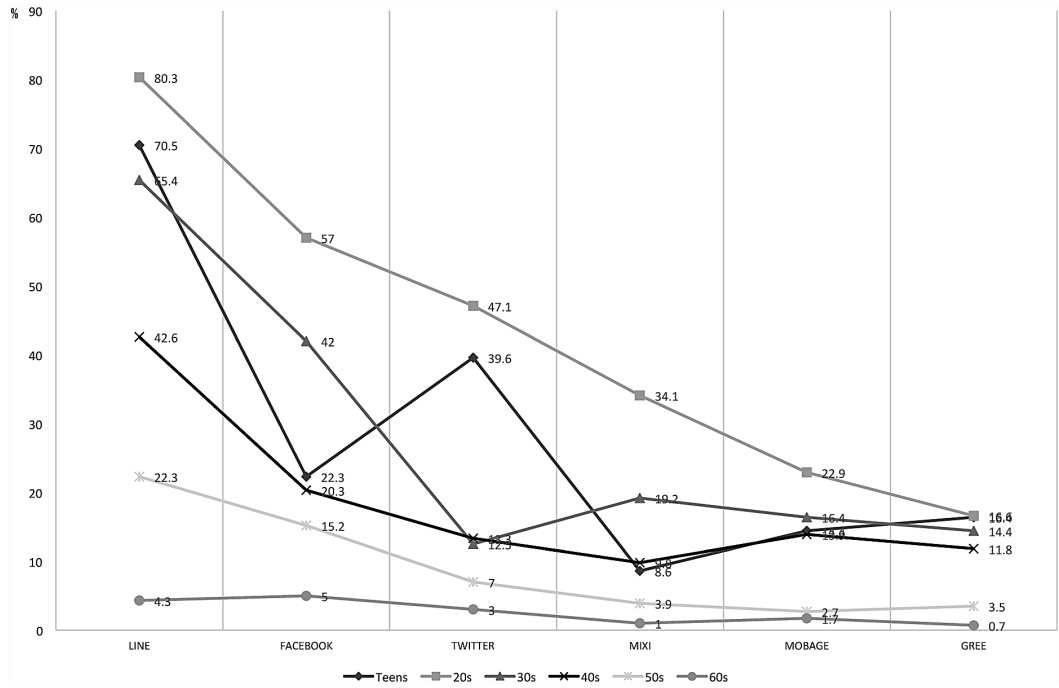


Figure 3. Use of social media across generations in 2013

Source: Ministry of Internal Affairs and Communications (2014).



CBOs⁴, and private enterprises providing disaster relief, formed in order to support those affected by the March 11, 2011 East Japan Earthquake” (JCN, 2014). We believe that member organizations of JCN are the best possible list of nonprofit organizations that were active in the aftermath of the 2011 Japan disasters. From this list, we identified nonprofit organizations that have one of the following legal status in Japan: “specified nonprofit corporation,” “public interest incorporated association,” “public interest incorporated foundation,” “general incorporated association,” and “general incorporated foundation.” A request for survey participation was sent to 434 organizations that we were able to identify active email address. Included in the message was a link to the survey constructed using SurveyMonkey. We opened the site between February 3, 2014 and March 24, 2014. A total of 143 organizations provided answers, resulting in a collection rate of 32.9 percent.

Table 1 lists questions in the survey that we use for analysis in this paper. While not examined in detail in this paper, the survey also asked nonprofit organizations reasons for choosing a specific communication media, emphasized message(s) in disseminated information, as well as perceived effectiveness of used communication channels.

Using the dataset developed from survey responses, we analyze how nonprofit organizations used social media to mobilize the public towards voluntary actions (for overall findings on how nonprofits transmitted information on opportunities for voluntary actions, see Okada & Yamauchi, 2014). We then employ ordered probit model models to identify relationships between usage of social media and performance of mobilization among nonprofit organizations. We estimate the impact of immediate, wide, and effective use of social media after controlling institutional attributes.

Table 1. Questions asked in the survey

Types of Solicited Voluntary Actions	Fundraising
	Volunteer Recruitment
	In-Kind Giving
	Did Not Solicit Voluntary Actions
	Others
<p>Medium/Communication Channels Used for Fundraising (multiple selection)</p> <p>* Nonprofits were asked to answer this question by the following five time periods: Added first three months (March to June 2011), second three months (July to September 2011), between half year and the first anniversary (October 2011 to March 2012), second anniversary (to March 2013).</p>	Organizational Website
	Organizational Newsletters and Magazines
	Listserv
	Flyers and Posters
	Organizational Blogs
	Held Events
	Citizens Media
	Facebook
	Twitter
	LINE
	Other Internet Use
	Television (Articles)
	Television (Commercials)
	Television (Others)
	Radio (Articles)
	Radio (Commercials)
	Radio (Others)
	Newspaper (Articles)
	Newspaper (Advertisement)
	Newspaper (Others)
Magazine (Articles)	
Magazine (Advertisement)	
Magazine (Others)	
Other Media	
Amount of Funds Raised (in 5 levels)	1 to 1 million Japanese Yen
	1 million to 10 million Japanese Yen
	10 million to 100 million Japanese Yen
	100 million to 500 million Japanese Yen
	500 million Japanese Yen and over

6. ANALYSIS RESULTS

6.1. Basic Statistics

Among the 143 nonprofit organizations that responded to our survey, 80 percent had the legal status of “specified nonprofit corporation,” registered under the 1998 Act on Promotion of Specified Non-profit Activities (for details, see Pekkanen, 2000). Twenty percent had the status of “public interest corporation”, including “general incorporated association” and “public interest incorporated association.” These two legal status were distinguished following the Public Interest Corporation Reform in December 2008.

Looking at the respondent organizations by location of main office, we find that 47 percent were based in Kanto region, in and around the capital Tokyo. Following Kanto was the three most affected prefectures in Tohoku region, which accounted for 32 percent: Iwate prefecture (10 percent), Miyagi prefecture (13 percent), and Fukushima prefecture (9 percent).

Among the respondents, 88 percent had made some sort of efforts to mobilize the public towards voluntary actions. 63 percent were involved in fundraising, while 64 percent recruited volunteers. 54 percent were involved in collecting goods to be sent to affected regions. 37 percent of the organizations were engaged in soliciting other types of activities and 12 percent did not make any mobilization efforts.

We believe our sample decently represents nonprofit organizations that were active in responding to damages caused by the 2011 triple disasters. In terms of legal status, “specified nonprofit corporation” is the most popular status within the nonprofit sector in Japan today (The Japan Association of Charitable Organizations, 2012). With regard to location, the most recent survey by the Cabinet Office of Japan (2015) reported that Tokyo by far had the largest number of “specified nonprofit corporations” (19.1 percent of total organizations nationwide). It is no surprise that several organizations located within the affected prefectures were engaged in response activities. For a more detailed description of Japanese nonprofit sector in general, see Yamauchi (2000), Yamauchi *et al.*, (2004), and Pekkanen (2006).

6.2. Change of Social Media Use in Fundraising

The survey asked the types of media that nonprofit organizations used to transmit information about opportunities of voluntary actions. Figure 4 lists the top 12 media used by nonprofit organizations to raise funds during the first three months after the initial shake on March 11, 2011. We find that many organizations tend use “in-house” media, or those that the organization can use rather freely and easily, such as organizational website, newsletters and listserv. Looking at use of social media during the first three months after 3.11, we learn that Twitter was used by 27.3 percent and Facebook was used by 25.0 percent of the sample organizations.

How did the use of these different types of media change over time, from relief, recovery, to reconstruction periods? Figure 5 shows the rate of change observed in the usage of respective media considering its usage before the disaster as the basis. Media are listed from high to low rate of change observed between the first and second anniversary of the disaster. We find that “organizational website” and “organizational newsletters and magazines,” both with high rate of use before the disaster, continued to be used by many organizations in the aftermath of the disaster. The rate of increase from relief to reconstruction period was about 10 percent.

“Newspaper (Articles)”, “Twitter” and “Organizational Blogs” were the three that showed rapid increase in usage during the relief period, within three months after the disaster. The rate of change was 50 percent, 33 percent, and 27 percent, respectively. Usage of “Facebook”, “Twitter” and “Television (News)” increased rapidly between the first and second anniversaries of the disaster, during the reconstruction phase. We find that some organizations began to use media that they had not used before the disaster. For instance, while only 22.7 percent of the respondent organizations used Facebook for fundraising before the disaster, the number almost doubled to 40.9 percent by the second anniversary.

Figure 4. Media used during the first three months for fundraising⁵

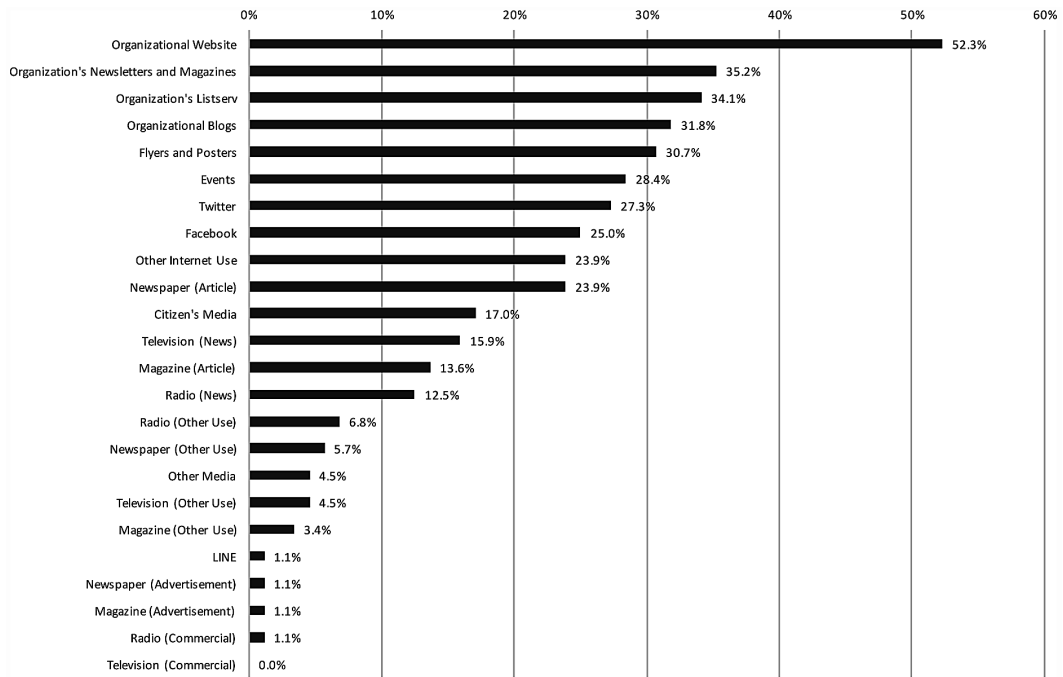
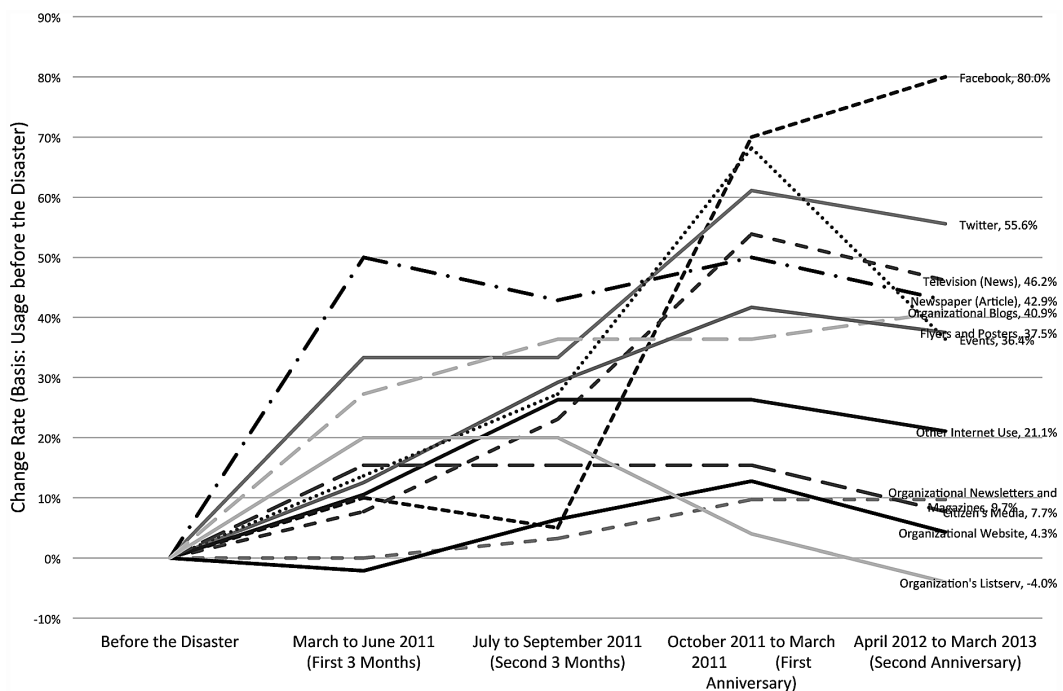


Figure 5. Rate of change in use of respective media after the disaster (basis: media usage before the disaster)



Also worth noting is the decline of usage rate in several media around the second three months period (July to September 2011). Usage rate of “Facebook” “Events” and “Televisions (News)” increased rapidly again by the first anniversary of the disaster. Rate of usage of several media dropped yet again by the second anniversary. There is a possibility that fundraising efforts had calmed down after a year, with the initial round of donations coming to an end.

Summarizing the changes in use of social media, we find that use of Facebook experienced the largest increase through relief, recovery, and reconstruction phase. The number of organizations that used Facebook increased moderately during the first three months and decreased slightly during the second three months. The rate then jumped towards the first anniversary and continued to increase as affected regions carried forward various reconstruction efforts. Changes in the use of Twitter were slightly different. As noted before, the use of Twitter increased by about 30 percent during the relief period. It did not increase during the second three months, but jumped again by another 30 percent towards the first anniversary. Interestingly, usage of Twitter has declined slightly towards the second anniversary.

6.3. Effectiveness of Social Media in Fundraising

As shown on Figure 5, the number of nonprofit organizations that used Facebook and Twitter increased over time in the aftermath of the 2011 Japan disaster, also known as 3.11 disaster. Was the use of such social media effective in achieving the initial objective of raising funds? In this section, we show the results of multiple regression model.

Our dependent variable is the amount of funds raised. As shown in Table 1, we had asked responding organizations to choose the amount of funds raised using five categories. Given the available sample size, we have re-categorized these five into three categories for analysis in estimation models: under one million Japanese Yen (approximately 10 thousand USD), one million to 100 million Yen (10-1,000 thousand USD), and over 100 million Yen (1 million USD). We apply the ordered probit models to estimate the function of this dependent variable.

In investigating the effectiveness of social media, we employ a couple of control variables. Table 2 lists these variables with its definition and descriptive statistics. We were able to use 69 observations for estimation. Looking at the dependent variable, or the amount of funds raised, 30 observations or 43 percent of these samples were under 10 thousand USD, followed by 25 observations or 38 percent in 10-1,000 thousand USD category, and 13 observations or 19 percent that raised over 1 million USD. For independent variables, we use “use of Facebook/Twitter” as well as “use of in-house media.” To examine the effectiveness of timing of use, we break these variables down to before and after the 3.11 disaster. We also input legal status, location of office, years since foundation⁶, and annual current revenue as control variables.

With the three hypotheses in mind (see Section 3), we examine three estimation models. Model 1 includes only variables on organizational attributes. Model 2 analyzes estimates on use of in-house media, which majority of the sample used before the disaster. Model 3 examines the effect of Facebook/Twitter use.

Table 3 presents the results of estimated fundraising outcomes. With regard to effects of organizational attributes, we find that the amount raised by “specified nonprofit corporations”⁷ is smaller than organizations with other legal status such as public interest corporations. Having its main office in three prefectures affected by the disaster was negatively significant, but only in the base model. This may be explained by the economic environment of these three prefectures in comparison to organizations that have their main office in the Tokyo metropolitan area, or by the situation of people who work for nonprofits as well as organizations themselves directly affected by a disaster. Our estimates also found that years after obtaining legal status had negative effect on the amount of funds raised after the disaster. In other words, the longer the organization is in operation, the less money they raise. This was rather counter-intuitive, as one would imagine that an organization would obtain more trust among the public and thus be an attractive destination for people’s donation in times of

Table 2. Definition and descriptive statistics of variables

Variable	Variable Type	Definition of Variable	Obs.	Mean	Std. Dev.	Min.	Max.
Outcome of fundraising	Category	Under 10 thousand USD, 10-1,000 thousand USD, 1 million and over USD	69	1.75	0.76	1	3
Legal status	Dummy	Specified Nonprofit Corporation=1, Public Interest Corporation=0	69	0.74	0.44	0	1
Duration after obtaining legal status	Count	Years	69	11.88	20.30	1	109
Current revenue	Dummy	Under 10 thousand USD	69	0.30	0.46	0	1
Current revenue	Dummy	10-1,000 thousand USD	69	0.38	0.49	0	1
Current revenue	Dummy	1 million and over USD	69	0.32	0.47	0	1
Location of office	Dummy	3.11 affected area=1, otherwise=0	69	0.29	0.46	0	1
Use of in-house media: neither before nor after 3.11	Dummy	Yes=1, no=0: Reference group	69	0.20	0.41	0	1
Use of in-house media: only before 3.11	Dummy	Yes=1, no=0	69	0.26	0.44	0	1
Use of in-house media: only after 3.11	Dummy	Yes=1, no=0	69	0.14	0.35	0	1
Use of in-house media: both before and after 3.11	Dummy	Yes=1, no=0	69	0.39	0.49	0	1
Use of Facebook/Twitter: neither before nor after 3.11	Dummy	Yes=1, no=0: Reference group	69	0.54	0.50	0	1
Use of Facebook/Twitter: only before 3.11	Dummy	Yes=1, no=0	69	0.20	0.41	0	1
Use of Facebook/Twitter: only after 3.11	Dummy	Yes=1, no=0	69	0.10	0.30	0	1
Use of Facebook/Twitter: both before and after 3.11	Dummy	Yes=1, no=0	69	0.16	0.37	0	1

disasters. However, studies in Japan have shown that as years pass by after founding, percentage of income from commissioned projects or subsidiary projects of central and local governments decrease while average annual current revenue increase (Ishida, 2008; JILPT, 2007). This trend indicates that operating an organization for longer term may strengthen its financing through development of program-based revenue as well as autonomy in providing public services based on its missions. Focusing on annual current revenue, we find that the outcome of fundraising is significantly smaller for smaller organizations when compared against organizations with annual revenue of 1 million USD. This shows a clear scale merit. In order to raise funds, nonprofit organizations must invest resources.

Our estimates reveal that social media use is effective for nonprofit fundraising, supporting hypothesis one on overall usage of social media. The analyses also reveal several other findings.

Table 3. Estimation results of amount of funds raised (ordered probit model)

	Model 1 Basic Model: Organizational Attributes		Model 2		Model 3	
			Timing of Media Use			
			Use of In-House Media		Use of Facebook/ Twitter	
Legal status	-1.119 (0.396)	***	-1.174 (0.412)	***	-1.263 (0.386)	***
Duration after obtaining legal status	-0.018 (0.006)	***	-0.019 (0.007)	***	-0.022 (0.007)	***
Current revenue: under 100 thousand USD	-2.065 (0.479)	***	-1.969 (0.509)	***	-2.124 (0.496)	***
Current revenue: 100-1,000 thousand USD	-2.187 (0.538)	***	-2.138 (0.544)	***	-2.406 (0.574)	***
Location of office: affected area	-0.739 (0.419)	*	-0.648 (0.416)		-0.518 (0.441)	
Use of in-house media: only before 3.11			-0.034 (0.491)			
Use of in-house media: only after 3.11			0.276 (0.634)			
Use of in-house media: both before and after 3.11			0.272 (0.483)			
Use of Facebook/Twitter: only before 3.11					-0.139 (0.440)	
Use of Facebook/Twitter: only after 3.11					0.978 (0.549)	*
Use of Facebook/Twitter: both before and after 3.11					1.095 (0.458)	**
Cut1. Constant	-3.131 (0.577)		-2.986 (0.739)		-3.163 (0.660)	
Cut2. Constant	-1.212 (0.466)		-1.049 (0.663)		-1.012 (0.503)	
Obs.	69		69		69	
Log Likelihood	-48.349		-44.328		-44.328	
Wald	40.260	***	45.510	***	45.511	***
McFadden's Adjusted R ²	0.232		0.195		0.246	

Reference group: "public interest corporation", 1 million- USD, not affected prefecture, not use in house-media/Facebook/Twitter both before and after 3.11 disaster.

***, **, * indicate statistically significant in 1%, 5%, and 10% level, respectively.

Note: Standard errors are shown in parentheses.

First, we find that Facebook/Twitter use *after* the disaster, referring to the first three months after disaster, may have a positive impact on the amount of money raised shown in the model 3 (at ten percent significance level). Our hypothesis two is thus supported. We did not find the same relation for in-house media shown in the model 2.

Second, we find that organizations that continuously used Facebook/Twitter *before* and *after* the disaster raised more money than those that did not. Given that continuous use of in-house media around 3.11 disaster are not statistically significant to affect the amount of funds raised, we find that

although using Facebook and Twitter may be effective in disseminating information, their usage in non-disaster times have a larger impact on fundraising. One can assume that the “friends” or “followers” of nonprofit’s social media accounts are educated to receive information from the organization and are thus more likely to respond to a request to make donations once a disaster strikes. Hypothesis three is thus supported.

Given that our hypothesis two and three were supported, we estimated the marginal effects of Facebook/Twitter use on the amount of funds raised. We find that continuous use of Facebook/Twitter *before* and *after* the disaster increased the probability to raise more than 10 thousand US dollars by 29.3 percent, and 25.9 percent for its use only *after* the disaster. Thus, using social media *before and after* the disaster may enhance the chances of receiving donations of large amount or of having more number of donors, compared to using social media only *after* the disaster. Nonetheless, with both variables having fairly large marginal effects, we find that social media use would have tremendous impact on fundraising.

It is interesting to note that only about 20 percent of nonprofits used social media only *before* the disaster. Our findings imply that had those nonprofits combined usage *after* the disaster, they may have achieved higher fundraising results. What prevented other organizations from encouraging people to give through Facebook and Twitter? A hint in answering this question was provided by a nonprofit practitioner, who shared with us the experience of intentionally *not* using social media after the disaster (Okada & Yamauchi, 2014) ⁸. While this nonprofit was aware that using Facebook and Twitter would bring in more funds, they were also aware that the organization does not have the capacity to respond to expected volume of responses. This organization therefore refrained from using Facebook and/or Twitter after the disaster.

6.4. Interaction Effects of Organizational Attributes

Our estimates show that organizational attributes might influence the effect of social media use in nonprofit fundraising. To further analyze this point, we estimated the predicted probabilities of the amount of funds raised using legal status and Facebook/Twitter usage, holding other variables at their means. Table 4 shows that “specified nonprofit corporation” are less likely than “public interest corporation” to raise more money to ranges of “1 million and over USD.” The probability of organizations with legal status of “public interest corporations” raising more money is higher. “Public interest corporations” have over a hundred years of history, and because its founding was approved by authorities before the aforementioned 2008 reform, both financial and human resources are secured to a certain extent. This also explains why the sign for duration after obtaining legal status was negative. Even though the predicted probability for “specified nonprofit corporations” to raise over 1 million USD is lower, the probability to raise money in the range of “10-1,000 thousand USD” is 0.72. Thus, we find that their use of social media is effective in raising funds to finance activities for disaster relief.

Table 4. Predicted probabilities of fundraising outcome by legal status and Facebook/Twitter usage

Facebook/Twitter: Use of Both Before and After 3.11	Under 10 Thousand USD	10-1000 Thousand USD	1 Million and Over USD
Specified Nonprofit Corporation	0.14	0.72	0.15
Public Interest Corporation	0.01	0.41	0.58
Difference	0.13	0.31	-0.44

7. CONCLUSION AND FUTURE CONSIDERATIONS

Given the advantage of instantly spreading information to mass public, social media is assumed to be an effective communication channel for nonprofit organizations in times of disaster, when they need to mobilize the public towards financial contribution, in-kind giving, and/or volunteering. This paper documented the use of Facebook and Twitter by nonprofit organizations during the 2011 Japan disasters. The study also examined whether such use of social media was effective in raising funds.

Key implications for strategies of nonprofit organizations are drawn from our findings. Use of social media was found to be most effective in mobilizing the public towards donation when used both *before* and *after* the disaster. Communication strategies in non-disaster times, therefore, are critical for nonprofit organizations. Our study also found that the use of social media is effective in raising more money than in-house media such as organizational websites and blogs.

The findings of this paper raise further questions to be examined. First, this paper has primarily focused on whether the respondent organizations used social media or not, and not on the types of media mix adopted by respective organizations. Assuming that nonprofits indeed use multiple communication channels and that some may be very strategic about the combination of media to use, future research should ask the types of media mix that were effective in raising funds in times of disasters.

Secondly, future study should further examine the effect of continuous media usage on mid to long term donation. In multiple disasters around the world, we have seen empirically that donations tend to concentrate immediately after the disaster and fade away as time passes. A series of national household surveys in Japan found that while average donation was around 3,000 Japanese Yen (about 30 USD) per year, thus 250-300 Yen (about 2.5-3 USD) per month, the average for the month of March 2011, when the disaster struck Northeastern Japan, was 2,083 Yen (about 20 USD, Ministry of Internal Affairs and Communication Statistics Bureau, 2011). This was almost ten times more than non-disaster times. The following April 2011 was 1,580 Yen (about 16 USD), followed by 622 Yen (about 6 USD) in May, and 242 Yen (about 2.5 USD) in June. We therefore see that nonprofit organizations may collect considerable amount of donation during the first three months, but the amount may drop soon afterwards. The trend for the first three months for the 1995 Kobe Earthquake was 1,841 Yen (about 18 USD), 1,018 Yen (about 10 USD), and 217 Yen (about 2 USD), respectively. Indeed, social media such as Facebook and Twitter were not popularized yet in Japan in 1995, and responses to the disaster were not organized at national or regional level. Given the spread of social media in the recent years, we should examine the possibility of using these communication tools to strengthen the outcomes of mid to long term fundraising.

Thirdly, the findings of our paper has not touched on one of the key characteristics of social media - its interactive nature. Unlike traditional media, these new tools enable two-way communication. Theoretically, nonprofit organizations are not only transmitters of information, but receivers of information. How such interactions lead to encouragement of voluntary actions is thus our next inquiry. Studies have found that despite such interactive nature, the way nonprofit organizations use social media so far has mainly been one-way (Svensson *et al.*, 2014), failing to capitalize on the innate two-way communication nature of social media (Muralidharan *et al.*, 2011). Whether and how nonprofit organizations in Japan used the interactive function of social media is a question to be researched in future papers.

Finally, we need to take into consideration that nonprofits not only disseminate information about voluntary actions, but also other information that are not directly intended to encourage the audience to give or to volunteer. These may be information about the disaster *per se* or about the organization's relief efforts. Because this study used a dataset where responding nonprofit practitioners were asked

to share their experience of social media use specifically for fundraising, we were not able to delve deeper into these different types of information that nonprofits presented to the general public. Future studies examining pieces of information that nonprofits send out via social media will contribute to broadening our understanding of nonprofit organizations as a sender of information.

ACKNOWLEDGMENT

We appreciate all nonprofit organizations that took the time to participate in our online survey. We also thank the two anonymous reviewers for their insightful suggestions and comments. This research is a part of the project “The Private Aid Initiatives in the Great East Japan Earthquake” co-organized by the Japan NPO Research Association (JANPORA) and the Japan NPO Center (JNPOC), supported by “Takeda Inochi to Kurashi Saisei Program Grant.” Part of this work was also supported by Japan Society for the Promotion of Science (JSPS) KAKENHI Grant Numbers 25885099 and 15K11981.

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ENDNOTES

- ¹ mixi is a Japanese social networking service where users can communicate with their friends through shared diaries, photos, and games.
- ² LINE is an application for mobile phones, smartphones, and tablets where users can chat or make an online call.
- ³ The survey was conducted as part of “The Private Aid Initiative in the Great East Japan Earthquake” co-organized by the Japan NPO Research Association (JANPORA) and the Japan NPO Center (JNPOC). The project is supported by “Takeda Inochi to Kurashi Saisei Program Grant.”
- ⁴ Acronyms stand for nonprofit organizations, non-governmental organizations, and community-based organizations, respectively.
- ⁵ Analysis presented in this figure only includes organizations who answered that they were engaged in fundraising activities in the aftermath of the disaster.
- ⁶ Because the year the organization began its operation and the year of obtaining legal status does not necessary match, year 2012 (after the 2011 disaster) were used to create this variable for some organizations.
- ⁷ Includes “approved” specified nonprofit corporations, which has obtained second round of authorization from the Japanese government for tax deduction for incoming donations.
- ⁸ From a discussion at the NPO Research Forum organized by Japan NPO Research Association (JANPORA) at Osaka University on April 20, 2014.

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