The Impact of Posting URLs in Disaster-Related Tweets
on Rumor Spreading Behavior

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Abstract

Twitter is an example of social media, which allows its users to post text messages, known as "tweets," of up to 140 characters. A tweet can include a shortened URL that provides further information that cannot be included in the tweet. Does including URLs in tweets influence the forwarding of the tweets during disasters, in which social media is flooded with unverified information? We conducted an experiment to answer this question. The results showed that posting URLs in disaster-related tweets increased rumor-spreading behavior even though the URLs lacked the hyperlink function. We identified some psychological factors that could explain this effect. We conclude by discussing the vulnerability of social media to rumor transmission in light of our results.

1. Introduction

Social media, such as Twitter (https://twitter.com/), plays an important role during disasters. It allows users to share crisis information with others. Yet, if users spread false information, social media will become a rumor-mill and panic may result.

In fact, false rumors spread through the Internet during responses to the Sichuan earthquake in 2008 [23], and through social media during responses to the 2010 earthquakes in Haiti and Chile [12][14]. Similarly, social media was flooded with false information soon after the Great East Japan Earthquake in 2011 [13]. The Japanese government warned about unverified information on social media, but misinformation persisted. In the aftermath of the Great East Japan Earthquake, Twitter was an especially popular communication tool because it allows its users to quickly post short text messages, or "tweets," of up to 140 characters, and to easily forward tweets to followers through a single click, known as "re-tweeting."

Although Twitter is a relatively recent technology started in 2006, the spread of false rumors during disasters has been repeatedly observed in the past research [15][16][21]. For example, Prasad (1950) concluded that similar kinds of earthquake-related rumors circulated in various countries during the last 1,000 years [16]. Although social psychologists have made progress in identifying the psychological factors associated with the rumor-spreading behavior [2] [7] [9] [18], the spread of false rumors not only continues to be a social problem but also appears to be becoming more severe as social technologies advance.

Our project explores what factors affect rumor-spreading behavior by examining both characteristics unique to social media and psychological responses in social media. The aim is to better understand rumor-spreading behavior in social media environment, and based on this understanding, better prepare people and officials for disaster response using social media technologies. Unlike the past studies on how psychological factors [24][25], perspective taking [6], source credibility [26], and submitter type [12] might affect information spreading behavior, we focus here on the effect of posting URLs in tweets on people's decision to spread rumors. In particular, we investigate the following research questions:

> *RQ1: Does including URLs in tweets accelerate information spreading behavior in social media environment even when the URLs lack the actual hyperlink function?*
>
> *RQ2: What psychological factors relate to the effect of URLs on information spreading behavior, if there is a significant effect of URLs?*

Before presenting the experiment, results, and practical implications, we review relevant past work and formulate our hypotheses.

2. Background

2.1. Rumor Spreading Behavior

Rumors are "*unverified and instrumentally relevant information statements in circulation that arise in contexts of ambiguity, danger, or potential threat and that function to help people make sense and manage*

risk" [9]. Rumor is different from gossip, which is an evaluative statement about someone's private lives.

Past studies identified some psychological factors associated with rumor transmission [1][2] [8][18][17][27]. For example, Allport & Postman [1] proposed, based on their analysis of the rumors after WWII, that the spread of rumor "will vary with the importance of the subject to the individuals concerned times the ambiguity of the evidence pertaining to the topic at issue." Other research [2] introduced anxiety as another key element in rumormongering. For example, anxious students were more likely to report that they heard a rumor [2]. In addition, the likelihood of sharing a rumor was associated with how anxious the rumor made people feel [10][18]. Based on these findings, Tanaka, et al. [25] revealed that rumor-spreading behavior in social media were also related to perceived accuracy, anxiety, and importance.

Social psychologists have also examined how to combat rumors. Chorus [7] extended the rumormongering model of Allport and Postman [1] by including that, as the critical thinking ability increases, the spread of rumors decreases. Related to critical thinking, a number of studies have examined the role of denial or rebuttal messages in impeding the transmission of rumor [3][4][8][11]. For example, Bordia, DiFonzo, Haines, and Chaseling [3] revealed the effectiveness of denial messages in reducing the believability in rumor. These findings are promising in reducing the spread of rumors in social media during disasters as rebuttal messages appear in such scenarios. In the aftermath of the Great East Japan Earthquake, for example, while many people spread rumors, others tried to stop the spread of false rumors by posting criticism tweets that criticize (e.g., question, deny, refute) the rumor-tweets.

2.2. Source Credibility

Closer to the focus of the current work, social psychologists have also shown that the credibility of information source is associated with the evaluation and dissemination of rumor and denial messages. For example, Jeager, Anthony, & Rosnow [10] revealed that authoritative source on a topic was effective for the evaluation of rumor believability. Bordia, DiFonzo, Haines, and Chaseling [3] showed that high credible denial messages could reduce people's belief and anxiety associated with rumors.

How do these results relate to social media environments? Social media allows users to describe a variety of information sources. For example, Twitter users can include shortened URLs (e.g. http://ow.ly/url/shorten-url) to direct readers to further information that supports the content of their tweets. These URLs appear to influence people's perception

and sharing of social media messages. For example, Castillo & Mendoza revealed that newsworthy topics tended to include URLs [5]. Suh, Hong, Pirolli, & Chi [22] showed that the presence of URLs had a strong relationship with information sharing in Twitter.

The effects of URLs might take place even when people do not click the URLs and make sure what the URLs refer to. Especially in a disaster situation, social media is flooded with information, and people cannot afford to spend much time on each tweet. Does a shortened URL itself increase information sharing behavior even when people do not check the validity of the URL? If it does, malicious rumormongers can include random URLs to promote the spread of false information in Twitter. On the positive side, officials can post URLs to spread important tweets that contain warnings and instructions during disaster response.

In particular, the current work tests the following hypotheses:

> *H1: Shortened URLs accelerate rumor and criticism spreading behavior in Twitter even when the URLs do not have an actual hyperlink function.*
> *H2: Shortened URLs increase perceived accuracy, anxiety, and importance of rumor and criticism tweets.*

3. Experiment

3.1. Participants

In total, 87 undergraduate and graduate students (45 male, mean age 19.9 years) were recruited from two universities in Japan, and voluntarily participated individually. Both universities were located in Kanto region, which was partly affected by the disasters associated with the Great East Japan Earthquake. Participants received course credit and a gift card in the amount of 500 Japanese yen (about $6.3 at the time of the experiment). The experiment was conducted between October 19, 2011 and November 8, 2011. Data collection was completed within eight months after the Great East Japan Earthquake.

3.2. Stimuli

First, we collected 10 *rumor-tweets* related to the disasters following the Great East Japan Earthquake including tweets about the nuclear accident, electric power issues, and supplying disaster areas. Rumor was defined as a tweet that had been criticized by one or more other tweets. An experimenter checked that each rumor-tweet included wrong, inaccurate, or suspicious information. No rumor-tweet offered any evidence to support its information. We also collected 10 *criticism-*

tweets that criticized the corresponding rumor-tweets (see Appendix for a complete list of stimuli). A criticism tweet was defined as a tweet that denied, refuted, or doubted another tweet by citing the tweet. Each tweet was posted in Japanese on Twitter between March 11, 2011 and September 7, 2011.

We then converted each of these 20 tweets to a 700×162 pixels image in the PNG format (see Figure 1). To eliminate confound, we controlled extraneous factors, such as user name and user image as follows: The user name associated with each tweet was generated by randomly combining alphabet and number; Every stimulus had the same user image consisting of an egg-shape on a red square background. Each image also contained the actual date when the original tweet was posted.

We created each criticism-tweet by adding the word "RT" (an abbreviation for Re-Tweet), the user name of the corresponding rumor-tweet, and part of the rumor-tweet to the criticism (see å 1, bottom). The maximum number of characters in each tweet image was 140 in Japanese.

Then, based on the 10 rumor-tweets and the 10 criticism-tweets, we created another set of 10 rumor-tweets and 10 criticism-tweets. Unlike the former set of tweets, half of tweets had a shortened URL at the end of the text (see Figure 2). The stimulus number of tweets with URL was odd in the rumor-tweets and even in the criticism-tweets (see Appendix). A shortened URL was generated by randomly combining alphabetical characters and number with a slash and a period (e.g., "p.tl/PIUdn" in Figure 2). We showed a shortened URL in light blue to make it similar to a real URL, but it did not have an actual hyperlink function.
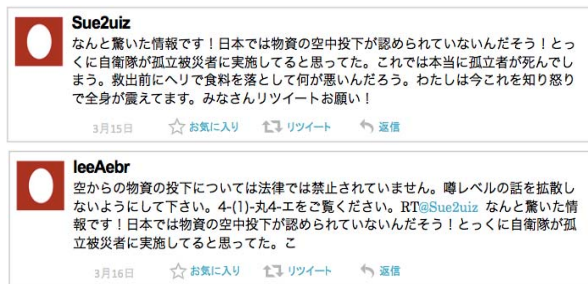

Figure 1. Example of Stimuli

Top) A rumor-tweet: "*Air drop of supplies is not allowed in Japan! I though it has already been done by the Self-Defense Forces. Without it, the isolated people will die! I'm trembling with anger. Please retweet!*"
Bottom) A corresponding criticism-tweet: "*The Japanese law does not prohibit air drop of supplies. Please don't spread rumor. Please see 4-(1)-丸 4-エ.*".
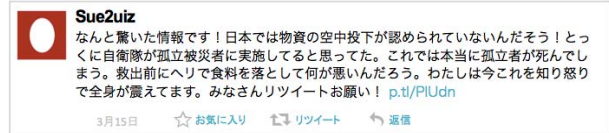

Figure 2. Example of Stimuli with URL
This rumor-tweet is identical to the rumor-tweet in Figure 1 except for the URL at the end of the text.

Table1. Experimental Design

Phase	URL Group (*n* = 47)		Control Group (*n* = 40)
1	Rumor with URL × 5	Rumor × 5	Rumor × 10
2	Criticism with URL × 5	Criticism × 5	Criticism × 10
3	Demographic information		
4	Debriefing		

Note. Participants were assigned to the URL group or the control group. Half of tweets in the URL group were shown with shortened URLs in light blue.

3.3. Experimental Design

The experiment involved two groups: the *URL group* and the *control group*. Each group had two types of stimuli, rumor tweets and criticism tweets (see Table 1). Criticism tweets were included in this study to examine the URL effects on the two different types of tweets. Of the 87 participants, 47 participants from one university were allotted to the URL group in which the odd numbers of the 10 rumor-tweets and the even numbers of the 10 criticism-tweets included shortened URLs. The reason for including both the tweets that had URLs and the tweets that did not have URLs was to examine the direct and indirect effects of URLs. The remaining 40 participants from the other university were assigned to the control group in which no tweet included URLs. We assigned the two groups from the different universities to the different conditions to avoid the possibility that students might learn about the design of the experiment through their conversation about the experiment. In both the URL and control groups, rumor-tweets were given before criticism-tweets. Within the 10 rumor tweets and within the 10

criticism tweets, the presentation order was randomized. In this experimental design, the evaluation of the rumor-tweets might have affected that of the criticism-tweets that came after the rumor-tweets. This order effect was examined in the previous study [24].

3.4. Procedure

Both the URL group and the control group went through the same procedure. Each participant completed the experiment on the Internet using a computer. Participants were told that they would be participating in a study to examine how the information related to the Great East Japan Earthquake spread. After obtaining informed consent, they were instructed to answer all questions within 50 minutes in the order presented. The experiment consisted of four phases in the following order:

1. Rumor-tweets: Participants answered the following eight questions for each of the 10 rumor-tweets:

(1) Familiarity – Have you heard this information? (Yes, No)

(2) Anxiety – How anxious did this information make you? (1 Not at all, 7 Highly anxious)

(3) Importance – How important do you think this information is? (1 Not at all, 7 Highly important)

(4) Intended receiver – Who should know this information? (Family, Friends, Victims, Many Japanese, Many people abroad, Anyone, Other)

(5) Intent to spread – How many people would you send this information to? (Open-ended)

(6) Self-accuracy – How accurate do you think this information is? (1 Not at all, 7 Highly accurate)

(7) Estimated transmission – How many people do you think would know this information at present? (Open-ended)

(8) Others-accuracy – How accurate would others think this information is? (1 Not at all, 7 Highly accurate).

The reason for using an open-ended format in questions (5) and (7) was to avoid constraining and influencing participants' judgments.

2. Criticism-tweets: For each of the 10 criticism-tweets, participants answered the same eight questions as in the rumor-tweets phase.

3. Demographic information: Participants answered demographic questions including where they lived when the Great East Japan Earthquake happened, how severely they felt that the earthquake affected them, how familiar they felt the tweets were, and how frequently they used Twitter.

4. Debriefing: The experimenter explained the purpose of the experiment to each participant. The experimenter emphasized that the tweets in the

experiment might be false, and that the spread of false rumor became a social problem after the disasters. For further information, we recommended useful books and Websites that discussed false tweets related to the disasters.

Table2. Demographic Information of the URL Group and the Control Group

	URL Group	Control Group
Age	20.1	19.8
Responses to the first rumor tweet without URL		
- Self-accuracy	3.46	3.18
- Others-accuracy	4.21	4.27
- Anxiety	4.13	4.36
- Importance	4.46	4.23
- Intent to spread	28,342,638	20,335,729
- Estimated transmission	9,171,091	5,002,173
Demographic Information		
- Lived in Kanto region (Lived in Tokyo)	100% (31.9%)	100% (10.0%)
- Affected by the disasters to some degree	80%	78%
- Had family members or friends affected by the disasters	64%	56%
- Had a Twitter account	72%	51%

Note: The averages of the four psychological factors were calculated based on approximately half of each sample ($n = 24$ in the URL group, $n = 22$ in the control group) because the other half responded to a different type of tweets: URL present in the URL group, URL absent in the control group.

4. Results

All participants lived in Kanto region. However, the participants in the URL group mainly lived in Tokyo and Kanagawa prefectures, while the participants in the control group mainly lived in Chiba prefecture. Sixty-nine participants (79%) were affected by the disasters to some degree. Fifty-two participants (60%) had family members or friends who were affected by the disasters. Fifty-three participants (62%) had a Twitter account.

Given the differences in residence and university between the URL group and the control group, we wanted to first make sure that the two groups did not differ systematically in the way they responded to tweets. We conducted t-tests using participants' responses to the first tweet without URL. This tweet

was the same in the URL and control groups. There were no significant differences between the two groups in self-accuracy, others-accuracy, anxiety, importance, intent to spread, and estimated transmission (all $ps > .10$). Table 2 compares the average responses to the first tweet and demographic information between the URL group and the control group.

To answer the two research questions, our analyses will focus on the intent to spread tweets (measured by Q5) and psychological factors (measured by Q2, Q3, Q6, and Q7).

For the intent to spread the 10 rumor-tweets and 10 criticism-tweets, the responses by the 87 participants ranged from 0 to 100,000 billion. The number of Twitter users who created their profiles is 383 million as of January 1, 2012 [19]. Thus 1.7% of responses indicating the intent to share with over 383 million were considered outliers and removed from the data. Table 3 shows the number of outliers and non-outliers as well as the mean and standard deviation of the intent to spread in each condition.

Table 3. Intent to Spread in the URL Group and the Control Group

Tweet type (The number of tweet)	URL group ($n = 47$)		Control group ($n = 40$)	
	Rumor-tweets (10)	Criticism-tweets (10)	Rumor-tweets (10)	Criticism-tweets (10)
Outliers	9	7	7	7
Non-outliers	461	463	393	393
Mean	16,881,570	16,842,632	9,106,830	11,216,704
(Standard deviation)	(43,277,914)	(41,653,835)	(28,737,809)	(33,486,242)

Note. Outliers were the responses that indicated intent to spread a tweet to more than 383 million people. This number was unreasonable for Twitter at the time when the experiment was conducted. Mean and standard deviation were based on non-outliers.
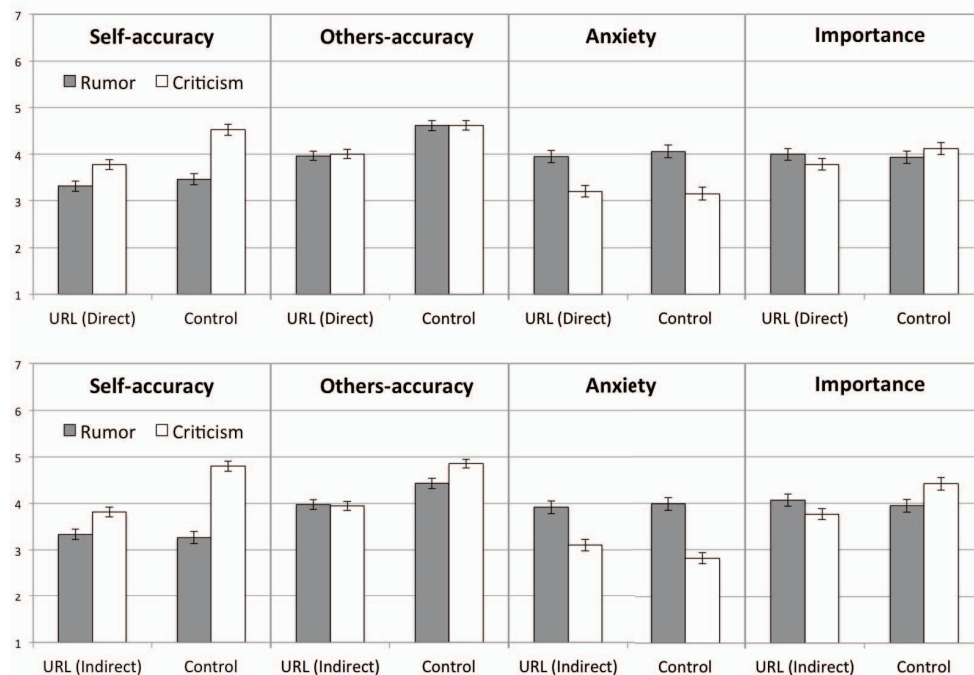

Figure 3. Psychological Responses to the Rumor-Tweets and the Criticism-Tweets

The top four figures compare the responses to tweets with URL in the URL group and the corresponding tweets without URL in the control group. The bottom four figures compare the responses to tweets without URL in the URL group with the corresponding tweets in the control group. Error bar indicates the standard error of the mean.

4.1. Rumor Transmission

The first hypothesis predicted that the presence of URLs in tweets would accelerate rumor-spreading behavior. In the URL group, the odd numbered rumor-tweets included URLs and the even numbered ones did not. All tweets were without URLs in the control group. The analysis of the first rumor tweet without URL presented previously indicated that the locational difference between the two groups did not influence the intent to spread rumors. Thus, the difference between the two groups in the following analysis can be interpreted as the effect of URLs, not location. We call the tweets with URLs in the URL group "direct tweets" because these tweets test the direct effect of URLs, and the tweets without URLs in the URL group "indirect tweets" because these tweets test the indirect effect of URLs, a spill over effect from the direct tweets.

To examine the direct effect of URLs, we conducted a one-way analysis of variance (ANOVA) on the intent to spread, with group (the URL group vs. the control group) as a between-subject factor. The results showed a significant main effect of group, F (1, 426) = 6.71, p < .01. The direct tweets in the URL group (M = 15,405,059, SD = 40,610,901) resulted in a significantly higher number than the corresponding tweets in the control group (M = 6,977,948, SD = 22,784,638), supporting the first hypothesis. We analyzed the indirect effect of URLs in the same manner. The effect of group approached significance, F (1, 424) = 3.2, p = .07. The indirect tweets in the URL group (M = 18,351,689, SD = 45,820,632) resulted in a marginally higher number than the corresponding tweets in the control group (M = 11,268,463, SD = 33,649,092).

The second hypothesis predicted that URLs would increase perceived accuracy, anxiety, and importance of rumors. The presence of URLs may increase the credibility of information source and thus the believability of the rumor tweets. We conducted one-way ANOVAs with group as an independent variable and the four psychological responses as dependent measures: self-accuracy, others-accuracy, anxiety, and importance. Figure 3 shows the average psychological responses in the two groups. Among the four psychological factors, the effect for others-accuracy was significant in both the direct and indirect tweets. The URL group (M = 3.97, SD = 1.57, M = 3.98, SD = 1.63, respectively) resulted in significantly lower values than the control group (M = 4.61, SD = 1.49, M = 4.43, SD = 1.56, respectively), F (1, 432) = 18.93, p < .001, F (1, 429) = 8.65, p < .01 respectively. There were no significant differences between the two groups for the other psychological factors. Regarding the

second hypothesis, the presence of URLs did not influence psychological responses to rumors except for others-accuracy.

4.2. Criticism Transmission

To examine the direct effect of URLs on the intent to spread the criticism-tweets, we conducted one-way ANOVA on the intent to spread, with group (the URL group vs. the control group) as a between-subject factor. The direct tweets in the URL group (M = 18,859,002, SD = 46,271,609) resulted in a marginally higher number than the corresponding tweets in the control group (M = 11,928,762, SD = 29,665,814), F (1, 425) = 3.26, p = .07. This weakly supports the first hypothesis. For the indirect tweets, there was no significant difference between the URL group (M = 14,834,953, SD = 36,471,590) and the control group (M = 10,508,261, SD = 36,960,451).

Regarding the second hypothesis, for the direct tweets, the URL group resulted in significantly lower values than the control group in self-accuracy (M = 3.78, SD = 1.61 vs. M = 4.53, SD = 1.74) and others-accuracy (M = 4.01, SD = 1.49 vs. M = 4.62, SD = 1.45), F (1, 432) = 21.58, p < .001 and F (1, 432) = 18.85, p < .001, respectively. There were no significant differences in anxiety and importance for the direct tweets.

For the indirect tweets, the URL group resulted in significantly lower values than the control group in self-accuracy (M = 3.82, SD = 1.67 vs. M = 4.80, SD = 1.54), others-accuracy (M = 3.95, SD = 1.53 vs. M = 4.85, SD = 1.28), and importance (M = 3.77, SD = 1.93 vs. M = 4.42, SD = 1.94), F (1, 433) = 40.25, p < .001, F (1, 433) = 43.32, p < .001, and F (1, 433) = 12.21, p < .001, respectively. There was no significant difference in anxiety. Taken together, inconsistent with the second hypothesis, which predicted that URLs would increase perceived accuracy, anxiety, and importance, the presence of URLs generally decreased perceived accuracy. URLs were partly associated with importance but not with anxiety.

4.3. Comparison of Rumor and Criticism

The analysis of intent to spread based on averages resulted in a similar pattern of results for both the rumor-tweets and the criticism-tweets. The URL group intended to spread the tweets to more people than the control group. However, the distribution was different in the two groups. Figure 4 shows that fewer participants tried to stop the spread of rumor-tweets in the URL group than the control group, whereas the criticism-tweets showed the opposite pattern.
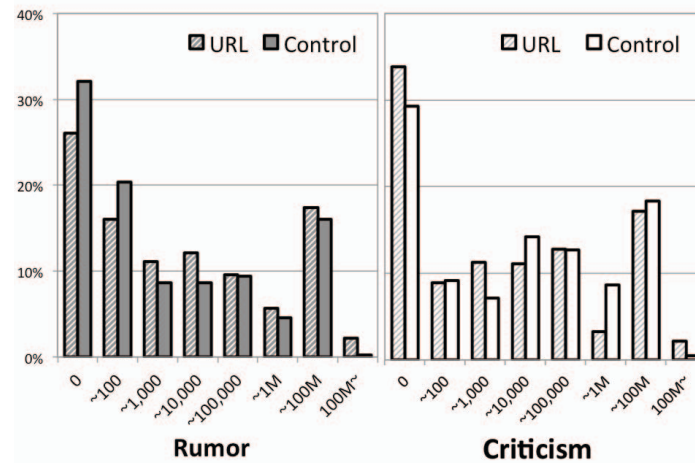
Figure 4. Distributions of the Intent to Spread the Rumor-Tweets and the Criticism-Tweets

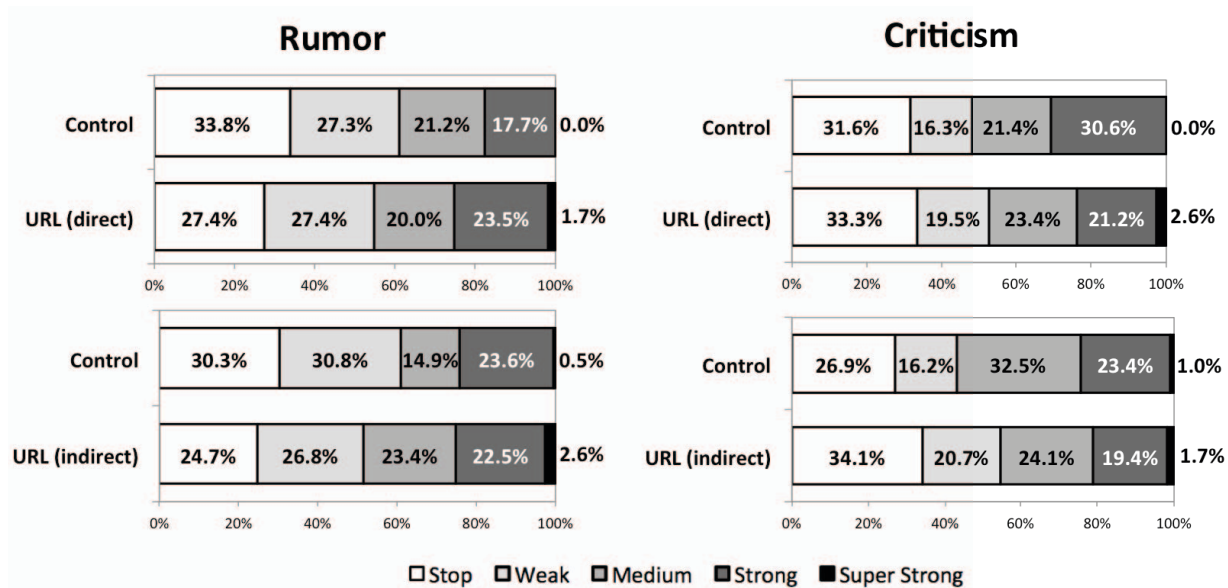The horizontal axis represents the number of people the participants wanted to spread the tweets to.

Figure 5. Categorization of the Intend to Spread the Rumor-Tweets and the Criticism-Tweets

URL (direct) means tweets with URLs in the URL group. URL (indirect) means tweets without URLs in the URL group. Tweets in the control group had no URLs. The five categories differentiate the strength of the participants' intention to spread the tweets based on the number of people in their responses to Q5: Stop (0), Weak (1-1,000), Medium (1,001-100,000), Strong (100,001-100 million), Super Strong (more than 100 million).

The intent to spread was analyzed in more detail by classifying the responses into five groups: Stop, Weak, Medium, Strong, and Super Strong. Stop is a response not to spread a tweet to anyone. Weak is a response to spread a tweet to one to 1,000. Medium is a response to spread a tweet to 1,001 to 100,000 people. Strong is a response to spread a tweet to 100,000 to 100 million people. Super Strong is a response to spread a tweet to more than 100 million people. Figure 5 shows the proportion of the five categories in the rumor-tweets and the criticism-tweets.

For the direct tweets, the rumor-tweets and the criticism-tweets showed different patterns. The proportion of the responses that intend to spread to more than 100,000 people was 25.2% in the URL group compared to 17.7% in the control group for rumor tweets, whereas it was 23.8% in the URL group compared to 30.6% in the control group for the

criticism-tweets. The proportion for the indirect tweets showed patterns similar to that for the direct tweets.

5. Discussion

The present study investigated the effect of posting a shortened URL in a disaster-related tweet on its spread. We compared two groups' intent to spread tweets. The URL group had disaster-related tweets with URLs, and the control group's tweets had no URLs. In this section, we discuss our results in relation to information reliability in Twitter.

5.1. Effect of URL on Rumor Spread

The main result was that including URLs increased the intent to spread rumor-tweets compared to those without URLs, which answered *RQ1*. Participants in the URL group intended to spread the rumors to approximately 17 million people on average, 1.9 times more than the control group. This result was consistent with the previous research showing that URLs had strong relationships with information sharing in Twitter [5][22][26]. The results of the average analyses, coupled with the proportion analyses, suggested that the presence of URLs increased the intent to spread rumors more than the intent to spread criticisms.

The effect of URLs took place in the current work although the URLs did not have an actual hyperlink function. Thus, the presence of a URL by itself can increase the spreading of rumor tweets. The reader does not need to consult the content of the URL to be influenced by it. This suggests that a malicious rumormonger can insert any URLs in false tweets and facilitate the spread of false information in Twitter.

We also analyzed what psychological factors might be associated with the intent to spread tweets. Answering *RQ2*, we found that others-accuracy was related to the rumor transmission, while self-accuracy and others-accuracy were related to the criticism transmission. Participants intended to share rumors more when they expected that others would perceive the rumor tweets as less accurate. Anxiety and perceived importance were not related to the effect of URLs, inconsistent with the previous research that concluded that having a credible source could reduce the anxiety level of Twitter users [3] and curb the spread of false rumors [14].

This inconsistency might have resulted because a shortened URL does not provide any cues about its credibility. In the previous research, credible source meant media such as CNN [14] or persons who were authoritative on a topic [10]. In contrast, the source in the current study was a shortened URL (e.g., p.tl/PIUdn). These URLs might not play a role as credible information source, and thus they might not increase anxiety, perceived accuracy, or importance. The results that the URLs did not increase any psychological factors tested here but instead lowered others-accuracy on the rumor-tweets could be due to the lack of action when the participants tried to open the URLs during experiments.

6. Limitations and Future Research

A limitation of the current work was that we measured the intent to spread tweets instead of measuring actual behavior. It is unclear whether or not the intent to spread tweets is associated with the information sharing behavior in Twitter. For example, according to a sample of the previous research [5], the average number of followers was approximately 840 and the maximum was approximately 9,430. Thus, although many participants intended to spread tweets to more than one thousand people in this experiment, they may not be able to do so in reality.

In addition, open-ended format we used in the current study generated some unrealistic numbers, resulting in outliers. For future research, an alternative would be to use a Likert scale to measure how likely participants intend to spread a given message to their followers. An option closer to the real environment would be to create a "share" button that operates like a retweet button in Twitter.

It will be fruitful to examine whether or not shortened URLs can indicate credible sources. One possibility will be to compare a URL with a hyperlink function against a URL without this function. Another approach is to record participants' thoughts when they rate the tweets with and without URLs.

7. Concluding Remarks

Social media will be again flooded with information when the next disaster strikes. The lesson from the current work is that posting URLs in tweets can facilitate rumor-spreading behavior. People will not have the capacity to check what the URLs refer to. Malicious individuals can promote the spread of false tweets by inserting fake URLs in tweets. On the flip side, crisis management team can help the spread of tweets containing warnings and instructions by including URLs. We have much to learn from behavior in social media to better prepare for future disasters.

Acknowledgements

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Appendix. Rumor-Tweets and Corresponding Criticism-Tweets Used in the Experiment

Tweet type		Summary of tweet	URL	
			URL group	Control group
1	**Rumor**	My friend at an insurance company said "Cancer insurance commercials stopped after the nuclear accidents."	✔	-
	Criticism	If you put it that way, sure. But that's a false rumor.	-	-
2	**Rumor**	According to my friend, a radioactive material was detected from urine after he ate sushi.	-	-
	Criticism	It's unclear if the cause of the radioactive material was the fish.	✔	-
3	**Rumor**	Toxic substance will drop with rain due to an explosion at Cosmo oil company.	✔	-
	Criticism	That's a definitely false rumor. NHK denied it.	-	-
4	**Rumor**	Medical license is deprived by MEXT if a doctor gives a certificate of being exposed to radiation.	-	-
	Criticism	The license cannot be deprived easily by MEXT or MHLW.	✔	-
5	**Rumor**	Robberies and rapes occurred during the Kobe earthquake.	✔	-
	Criticism	Few robberies and rapes occurred. Victims helped each other orderly. Why do you spread lies and false rumors? Stop it.	-	-
6	**Rumor**	It was denied strongly, but, after all, the meltdown occurred.	-	-
	Criticism	Has the possibility of a meltdown been pointed out?	✔	-
7	**Rumor**	Airdrop of supplies is not allowed in Japan!	✔	-
	Criticism	The Japanese law does not prohibit the airdrop of supplies.	-	-
8	**Rumor**	Tokyo Electric Power Co.'s workers run and left. They were drinking in other city.	-	-
	Criticism	Tokyo Electric Power Co. "The workers were found dead."	✔	-
9	**Rumor**	Did anyone watch "Senior vice transport minister Tsujimoto protested against the rescue operation by US army" on NHK?	✔	-
	Criticism	There's no source but the tweet, so it would be a rumor.	-	-
10	**Rumor**	Chubu, Kansai, and Kyusyu Electric Power companies are beginning to transfer electricity to Kanto. Please cooperate!	-	-
	Criticism	Transfer is impossible because of the difference in frequency.	✔	-

Note: A check indicates the presence of a URL for the associated tweet and a dash indicates the absence of a URL.