

Breaking News Commentary: Users' Reactions to Terrorist Attacks in English-Speaking Twittersphere

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Abstract. The micro-blogging platform Twitter is increasingly applied for breaking news dissemination and commentary. The users become so-called citizen journalists, as in some cases they are the first ones to report on breaking events. This paper investigates the tweeting behavior of Twitter users in view of three terrorists' attacks that stroke Europe in 2015 and 2016, the attacks on Charlie Hebdo in January 2015, in Paris in November 2015, and in Brussels in March 2016. These attacks were triggering events for a wave of tweets showing support (#PrayForParis, #PrayForBelgium), solidarity (#JeSuisCharlie, #JeSuisBruxelles) or promotion of values like freedom of speech and press (#FreedomofSpeech). This study sheds light on the basic information behavior of English-speaking Twitter users participating in the information exchange on these three events.

Keywords: Twitter · Information behavior · Terrorist attacks · Tweeting

1 Introduction

Social media have become an important channel for people to share information [8]. Especially since 2006, when the social media platform Twitter got online [3] and the users started answering the question on Twitter's interface: "What are you doing right now?" [5]. With time, it became a "microphone"- platform, where millions of users constantly post their opinions, comments and thoughts. "Users literally post everything going through their minds in an almost unconscious manner, making the [social media] stream facts-reach but also feelings-intensive at the same time" [4]. Twitter users have exactly 140 characters to express what they feel, what they do and what they think about. They are not limited to posting the so-called "tweets," but due to Twitter's hybrid nature, can make use of the push and pull service. They can search for tweets, they are interested in by using hashtag (#) or user accounts, they can also follow other users and news channels [7]. Furthermore, they can include diverse multimedia (pictures, videos), links to external websites (outside the Twittersphere) and linkages to other Twitter accounts through the so-called "@"-mentions (hence, links within the Twittersphere) in their tweets [5]. Letierce et al. [9] categorized Twitter user into subcategories "from experts to amateurs by participants, media and so on" there are no limits – everyone can use Twitter.

People do not only want to consume content provided by others, but rather to produce own tweets. Java et al. [6] investigated reasons for which interactions on Twitter take place. They categorized these reasons into “daily chatter”, “conversations”, “sharing information/URLs” and “reporting news”. According to Mano and Milton [10], the user-generated content on breaking news or events is a key factor of the so-called citizen journalism. Niekamp [11] defines the citizen journalism as “the involvement of non-journalists in gathering, writing and disseminating information.” It could be understood as “an active role in the process of collecting reporting, analyzing and disseminating news and information” [2].

This was also the case during the Charlie Hebdo attacks. All over the world, people sorrowed for victims and their family members by using Twitter. After the first tweet with the hashtag #JeSuisCharlie, reports by news agencies, YouTube videos and, in general, global reactions of the community followed [5, 12]. In very short time, the introduced hashtag became a symbol for solidarity with the victims and unity against terror. Salovaara-Moring [12] explains the #JeSuisCharlie as follows: “These three words became a metaphor for organizing news flows, opinions, affects and participatory events in the digital media ecosystem. It became a global slogan adopted by supporters of the freedom of expression.” According to An et al. [1], the “hashtags #CharlieHebdo and #JeSuisCharlie (‘I am Charlie’) became an explicit endorsement of freedom of expression and freedom of the press, and travelled fast and wide in Twitter.” In this study, we will investigate the tweeting (or information) behavior of Twitter users in view of these terrorist attacks and two subsequent attacks that took place in Paris and Brussels.

The first triggering event chosen for the investigation is the already mentioned terrorist attack on the editorial office of Charlie Hebdo in Paris in January 2015. The second triggering event are the attacks in Paris in November 2015, and the third one are the attacks in Brussels in March 2016. We aim to investigate how the Twitter community tweeted about these events. Are there recognizable differences in user behavior between the three investigated attacks? And, are there changes in user behavior during the seven days after the attack? This investigation is based on the following research questions:

- RQ1: What is the dissemination and impact level (number of RTs and likes) of the tweets on the three triggering events and how does it change over the period of one week?
- RQ2: How often do the users include external links (normal links) and links within the Twittersphere (@) in the tweets on the three triggering events and how does this information behavior change over the period of one week?
- RQ3: Is there an association between embedding links (external and internal) and the dissemination and impact level (number of RTs and likes) of the tweets on the three triggering events and how does it change over the period of one week?
- RQ4: Is there an association between embedding external and internal links in the tweets on the three triggering events and how does it change over the period of one week?

2 Methods

With the help of the Python application Tweepy and partially manually via Twitter advanced search interface, we have collected 21,000 tweets from English-speaking Twittersphere. From all “top” tweets for each day of the week after the attack we randomly selected 1,000 tweets. We have chosen only the “top” tweets since they are the most popular ones with the potentially highest impact and dissemination level. We searched for the tweets by using the most trending hashtags. For the first terrorist attack in Paris we selected tweets posted from 7th to 13th of January 2015 which included the hashtags #JeSuisCharlie or #CharlieHebdo. For the second investigated attack, which also took place in Paris and involved suicide bombers and several mass shootings across the city, we selected tweets posted from 13th to 19th of November 2015, which included hashtags #PrayforParis, #PeaceforParis or #NousSommesParis. The last investigated terrorist attack was the one in Brussels that occurred at the Brussels airport and the Maalbeek metro station in the city center, here, the gathered tweets were posted from 22nd to 28th of March 2016 and included hashtags #PrayForBelgium, #JeSuisBruxelles, or #BrusselAttacks.

The gathered Twitter data was saved into a database and further processed with Excel and Python. All external links (starting with <http://>) and all internal links, mentions (marked with “@”), were automatically extracted with Python. After the data was prepared, we conducted statistical analysis with SPSS. Besides the descriptive statistics, we applied Pearson’s point-biserial correlation to investigate potential correlations between embedding external or internal links and the number of retrieved likes and RTs. We also computed the chi-squared values for the association between embedding external and internal links in one tweet.

3 Results

The first research question concerns the dissemination and impact level (number of RTs and likes) of the tweets about the three triggering events and its change over a period of one week. As we can see in the Fig. 1 (left column), the tweets on triggering event got the most likes and RTs on the second day after the first triggering event (Charlie Hebdo). For the other two triggering events the tendency is different. The tweets got in average the most tweets on the 1st day, followed by an abrupt drop on the second day and low levels of dissemination throughout the whole week. The second research question concerned the embedding of external links (“link”) and links within the Twittersphere (“@”) in the tweets on the three triggering events. As we can see in Fig. 1 (right column), there were more internal links on the first two days considering the first triggering event. From the 3rd day, the tweets included more external links (34%–46% of the tweets) than internal ones (31%–33%). Looking at the second triggering event, only on the first day there were slightly more internal (7.4%) than external links (6.9%). On the remaining days, 31% to 45% of the tweets included external and 22.9% to 33.4% internal links. As for the last triggering event, there were more external (30.9%–52.1%) than internal links (18.6%–29.4%) included in the tweets on all seven days.



Fig. 1. The dissemination and impact level of tweets represented by the average number of likes and retweets per day (on the left) and percentage of tweets including external and internal links (“link” and “@” respectively) (on the right).

The third research question regards the association between embedding links (external and internal ones) and the dissemination and impact level (number of RTs and likes) of the tweets. Table 1 shows the overall correlation values between these variables for all three triggering events. The only significant correlations are given for the second triggering event, the Paris terrorist attacks. There appear to be weak and negative correlations between embedding internal and external links and the number of retrieved likes and retweets. This means that tweets with links are more likely to receive less likes or retweets. There were no significant correlations for the other two triggering events.

Table 2 presents the correlation values between embedding internal links (“@”) and the number of retrieved likes for all three triggering events (TE1–TE3) and each of the seven days. When investigating the association for each day separately, the only significant correlations appear to be given for the third triggering event on the 5th (positive correlation) and 7th day (negative correlation). However, both are very weak.

Table 1. Overall correlation values between embedding external and internal links (“link” and “@”), and the level of impact and dissemination (“like” and “RT”) of the tweet for the three investigated triggering events

	Charlie Hebdo	Paris attacks	Brussels attacks
@ x like	-0.011	-0.03*	-0.005
@ x RT	-0.011	-0.031**	-0.008
link x like	0.005	-0.032**	-0.015
link x RT	0.008	-0.035**	-0.014

*p < 0.05, **p < 0.01, ***p < 0.001

Table 2. Correlation between embedding internal links (@) and the number of retrieved “likes” for each triggering event (“TE”) and each of the seven days.

@ x like	1st	2nd	3rd	4th	5th	6th	7th
TE1	0.003	-0.021	-0.04	-0.02	-0.035	-0.036	-0.017
TE2	-0.033	-0.022	-0.029	-0.037	-0.024	-0.027	0.037
TE3	-0.015	0.019	-0.007	-0.041	0.073*	-0.004	-0.07*

*p < 0.05, **p < 0.01, ***p < 0.001

Table 3. Correlation between embedding internal links (@) and the number of retrieved “RTs” for each triggering event (“TE”) and each of the seven days.

@ x RT	1st	2nd	3rd	4th	5th	6th	7th
TE1	0.02	-0.021	-0.037	-0.022	-0.047	-0.032	-0.008
TE2	-0.034	-0.02	-0.043	-0.036	-0.024	-0.032	-0.009
TE3	-0.015	-0.01	-0.031	-0.049	0.039	-0.013	-0.069*

*p < 0.05, **p < 0.01, ***p < 0.001

When considering the association between internal links and the number of RTs (Table 3), the only significant correlation is given for the third triggering event on the 7th day. This correlation is negative and weak.

The correlations between embedding external links and the number of retrieved likes are shown in Table 4. Here, again, the only significant values are given for the third event on the 7th day. The correlation is negative and weak. There were no significant correlations between embedding external links and the number of RTs (Table 5) for any of the triggering events.

Table 4. Correlation between embedding external links and the number of retrieved “likes” for each triggering event (“TE”) and each of the seven days.

Link x like	1st	2nd	3rd	4th	5th	6th	7th
TE1	-0.62	0.034	-0.042	-0.052	0.008	-0.032	-0.009
TE2	-0.01	-0.01	0.023	-0.034	-0.03	-0.034	-0.006
TE3	-0.022	-0.061	0.019	0.032	-0.06	-0.041	-0.078*

*p < 0.05, **p < 0.01, ***p < 0.001

Table 5. Correlation between embedding external links and the number of retrieved “RTs” for each triggering event (“TE”) and each of the seven days.

Link x RT	1st	2nd	3rd	4th	5th	6th	7th
TE1	-0.038	0.037	-0.033	-0.046	0.015	0.009	0.033
TE2	-0.017	-0.017	0.055	-0.028	-0.031	-0.039	0.039
TE3	-0.018	-0.053	-0.003	0.043	-0.056	-0.043	-0.054

*p < 0.05, **p < 0.01, ***p < 0.001

Table 6. Chi-squared table for association between embedding external links and embedding internal links for all three triggering events (TE1-TE3).

Link x @	@ not included	@ included	Sig.
TE1	60.92%	39.10%	0.000
TE2	70.90%	29.10%	0.000
TE3	72.41%	27.59%	0.001

*p < 0.05, **p < 0.01, ***p < 0.001

The fourth research question concerned the association between embedding external and internal links simultaneously in the tweets. As we can see in Table 6, for all investigated triggering events the most tweets including external links did not include internal “mentions” at the same time (60.9%, 70.9% and 72.4% respectively).

4 Discussion

In this study, we investigated the tweeting behavior of users in English-speaking Twittersphere in view of three triggering events being terrorist attacks. The analysis of average number of RTs and likes that the analyzed tweets included showed a tendency of higher impact and dissemination on the day of the triggering events, followed by an abrupt drop on the following six days.

Regarding the embedding of links, the users include more external links than internal ones (links to other Twitter accounts). Also, there are more users who only include one type of link in the tweet. There were only few weak correlations between embedding links (either internal or external) and the number of received likes or RTs. This confirms our previous findings that including links in tweets in the context of such triggering events does not necessarily affect the number of received RTs or likes [5].

Interesting aspects to investigate in future research would be a content analysis of tweets, which is another possible factor influencing the number of likes and RTs. Furthermore, a more detailed characterization of the link types included in the tweets could explain the higher or lower dissemination levels. Finally, an analysis of hashtags and the context words included in the tweets could shed light on the attitudes and emotions of the users towards the breaking news.

Acknowledgments. We would like to thank Dr. Elmar Lins for his assistance during the data analysis and Prof. Wolfgang G. Stock for his supervisory support.

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