

## Hong Kong protests

### A quantitative and bottom-up account of resistance against Chinese social media (Sina Weibo) censorship

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#### **Abstract**

*Chinese online censorship has been explored by many scholars from a top-down perspective and has concentrated on the macro-level. It appears that there are few, if any, existing studies that feature a bottom-up perspective while exploring the micro-level aspects of online media censorship. To fill this gap in the research, this article takes a bottom-up view to research the Occupy movement in Hong Kong as a case study in order to analyze the resistance of social media users under conditions of heavy censorship. That is, the research question seeks to uncover the novel ways Weibo users use to try to circumvent Weibo censorship. It is confirmed that the microbloggers tend to use embedded pictures and user ID names instead of traditional text format to camouflage sensitive information shared with other users; that being the case, Weibo users tend to create new accounts once their original accounts have been closed or monitored.*

#### **Keywords**

*Occupy Central, social media, censorship, resistance, bottom-up perspective*

Social media have been widely used in political activities – notably, during political rebellions against autocratic governments in the Middle East and North Africa, during political mobilizations against government corruption and inefficient crisis management in South-

ern Europe, and to facilitate the dissemination of information and bypass mainstream media censorship (Breuer & Groshek, 2014; Sloam, 2014; Tunç, 2013). Social media played a role in facilitating political participation (Sloam, 2014) and organizing popular protests (Breuer & Groshek, 2014) in addition to being an unfettered source of information (Tunç, 2013) for collective activities.

This article adopts a quantitative empirical approach to study Chinese social media censorship by analyzing censored posts from Sina Weibo, a Chinese Twitter-like microblogging platform, which is referred to as the Occupy Movement in Hong Kong and took place in 2014. The Chinese online sphere has been manipulated by an extensive, sophisticated, and broad-reaching system of Internet filtering, controlled by the state. Although Chinese online censorship research on how the state filters information has been investigated by many media scholars from a top-down perspective (Bamman et al., 2012; Fu et al., 2013; King et al., 2013; MacKinnon, 2009; Zhu et al., 2012, 2013), previous studies in this field have primarily concentrated on the macro-level – for instance, generating lists of “sensitive topics” while using the previously mentioned top-down research perspective (how censorship systems filter sensitive information). It appears that there are few, if any, existing studies that feature a bottom-up perspective and explore the micro-level aspects of media censorship.

To fill this gap in the research, this article will use the Occupy Movement in Hong Kong as a research case (i.e., micro-level) to analyze behaviors of social media users in disseminating sensitive information under conditions of heavy censorship (i.e., from a bottom-up perspective). In other words, the research questions of this study seek a) to study how Weibo users try to circumvent social media censorship in order to disseminate banned information, b) to evaluate the effectiveness of the new tactics developed by social media users to address censorship, and whether these tactics will have any impact on a post’s longevity on Weibo, and c) to delve into the Weibo deletion mechanism with respect to a concrete event.

The reason the Occupy Movement was chosen is due to the findings of King et al. (2013) that Chinese authorities tend to curtail any messages referring to events that harbor the potential for action that may trigger collective activities such as protests. Thus, Occupy Central is definitely an ideal case for analyzing Chinese social media censorship. Although Chinese online censorship is effective, some users have successfully circumvented it with “very real effects” (Rauchfleisch & Schäfer, 2015).

This study employs a content analysis method to generate quantitative data from censored posts and uses the SPSS statistic 19.0 data analysis software to explore potential correlations between relevant factors. It has been revealed that a) the microbloggers tend to use embedded pictures (i.e., visual content) and user ID names instead of the traditional text format to camouflage the sensitive information that is being shared, b) that Weibo users will create new accounts once their original accounts have been closed, and c) that

these tactics mentioned above have been proven to have a significant influence on prolonging a Weibo post's longevity in the online domain.

## Internet censorship practices and Weibo content deletion

Occupy Central was a political action comprising sit-ins along with street occupations and blockades, which lasted from September until December 2014 in Hong Kong. The main political demands of this occupation were for genuine universal suffrage to be realized, for the resignation of Chief Executive Leung Chun-Ying, for the withdrawal of the NPC Standing Committee's decision to preselect candidates for the 2017 Chief Executive elections, and for the submission of a new electoral reform plan.<sup>1</sup>

The majority of the earlier studies within the field of Chinese Internet censorship focused on social media platforms such as Sina Weibo (Bamman, O'Connor & Smith, 2012; Fu, Chan & Chau, 2013; King, Pan & Roberts, 2013; MacKinnon, 2009; Zhu, Phipps, Pridgen, Crandall & Wallach, 2012, 2013) while others have, instead, investigated censorship in blog platforms (MacKinnon, 2009) and discussion forums (King et al., 2013). Though these studies were conducted on different platforms, they all tend to research censorship practices at the macro-level (i.e., generate or examine which topics or keywords have high deletion rates); and they also tended to enumerate various methods that have been implemented for online censorship (i.e., top-down descriptions of the Weibo deletion mechanism). Moreover, some studies (MacKinnon, 2009; Rauchfleisch & Schäfer, 2015; Zhu et al., 2013) also mentioned users' reaction to content deletion and analyzed whether the attributes of some posts (e.g., number of friends) would affect the longevity of a post (Zhu et al., 2013). In the context of this article, being *censored*, *deleted* or *blocked* refers to messages on the Weibo platform that are no longer accessible to the public due to a political sensitive reason.

## New ways to circumvent censorship

All of the studies discussed above may have underestimated the importance of other attributes that may have an impact on information deletion. These attributes have been implied by some scholars. For instance, both Fu et al. (2013) and Zhu et al. (2012, 2013) mentioned the significance of embedded pictures within Weibo posts in the context of censorship, but Zhu's study was the only one that attempted to delve into the effect the pictures may have. The impact pictures may have on the survival of a post could be that the pictures themselves contained much more information than the post's textual content, which has the capacity to attract much more Weibo traffic and encourage numerous Weibo users to share the content—which, in turn, then drew the attention of Weibo censors. This implied that posts containing visual content (such as pictures) are more informative (e.g., able to

convey an explicit attitude and political opinions, beyond what the textual content can express). In accordance with these suggestions, the first hypothesis is articulated as follows.

Hypothesis 1: When they publish sensitive material, Weibo users may prefer to convey more information and express dissenting attitudes in the embedded pictures rather than in the text content if posts containing visual content (such as pictures) are more informative.

Some social media account attributes, such as the number of friends or number of posts the Weibo user has, were confirmed to have an effect on how long a post can exist (Zhu et al., 2013). Whether other user attributes, such as user ID, may affect a post's duration has remained unknown, which leads to the second hypothesis.

Hypothesis 2: If sensitive keywords that are present in a Weibo user ID have an impact on the post's duration, the survival time of Weibo posts from a user ID with sensitive keywords may be significantly different from the survival time of posts from a user ID without such keywords.

In addition, Zhu et al. (2012) pointed out that Weibo has a multilayered censorship system, including censorship methods targeting camouflaged posts, the monitoring of specific users, account closures, and search filtering. Zhu et al. (2012, 2013) claimed that Weibo users who have been censored in the past will be more likely to be censored again in the future. In addition, they believed that monitoring specific users was one mechanism of social media censorship. Similarly, for their study samples, Fu et al. (2013) chose posts from Chinese media industry critics, dissident writers, journalists, and scholars as well as other users with a high follower count because these researchers believed that these activist microbloggers were subject to the most censorship in the Chinese context. These assumptions were presumably true on a large scale. In this study, Weibo users who constantly post Occupy Movement-related posts could be labeled as "activists." These activists are probably monitored (or have already been monitored) by the authorities and are facing the challenge of having their Weibo accounts closed. Consequently, they must deal with having their posts deleted at a much faster rate. To overcome these challenges, these activists will probably create new Weibo accounts to continue disseminating sensitive information.

Hypothesis 3: The protest activists may try to create new Weibo accounts to prevent their user ID from being closed in order to prolong a Weibo post's longevity. If so, then there may be a negative correlation between Post Duration and user ID uniqueness, as well as a positive correlation between Post Duration and user ID activeness

The protest activists who fervently support the Occupy Movement will probably continue to publish relevant information about the protests even when the general public are no longer interested or when the movement could no longer maintain its momentum. Here comes the fourth hypothesis.

Hypothesis 4: If the number of Weibo posts decreases when the Occupy protests lose momentum—but, despite the decreasing number of posts related to the Occupy Movement, the supporters of the protest (the ‘activists’) continue to publish related sensitive information, there may be a positive correlation between Post Date and user ID uniqueness.

## Understanding Weibo censorship from a case study

Despite exploring the influence of embedded pictures and the user ID on circumventing social media censorship on Weibo, it is inevitable that this study also analyzes the effect the textual content of Weibo posts have on post deletion, which has already been extensively explored by previous studies. These studies adopted various methods to extract lists of sensitive keywords and to generate sets of sensitive topics. For instance, King et al. (2013) disclosed that sensitive terms or topics related to collective action are subject to strict censorship. Likewise, Bamman et al. (2012) agreed that the presence of certain sets of terms in a message increases the likelihood for that message’s deletion.

However, whether the number of sensitive terms present in posts will lead to the higher likelihood for the deletion of Weibo posts is still *unknown*. Inspired by Zhu et al. (2013), who developed the idea of the “post lifetime” variable to refer to the time difference between the creation of a post and its eventual deletion, this study will adopt this idea and suggest that “*post duration*” be used as a central measure to analyze or determine what factors or variables might affect social media deletion practices. Given the background of this research question and the Occupy Central movement context, the fifth hypothesis of this study is as follows.

Hypothesis 5: If the presence of a number of sensitive keywords in a Weibo post has an impact on that post’s duration, the duration of a Weibo post’s lifetime will be reduced with the increase in the number of sensitive keywords.

The five hypotheses presented above are aimed at exploring Weibo users’ reactions in a context of effective social media censorship and are formulated to account for a bottom-up perspective. The following hypothesis (the last one in this study) analyzes changes to the practices of Weibo censors in response to the developments of current events (Bamman et al., 2012). Li (2009), MacKinnon (2011), and King et al. (2013) have already claimed that the Internet content censors have large-scale autonomy to learn and innovate their censorship practices since the realization of a sophisticated and effective censorship apparatus with many moving parts requires flexibility. Though this assumption has been noted in previous studies, there is no quantitative analysis that has been conducted to confirm this suggestion, which is due to the lack of a micro-level case study in this field of censorship studies.

This study will use Occupy Movement to examine the suggestion just mentioned.

Hypothesis 6: If Occupy Central movement continues, protest posts may be evaluated as less sensitive by Weibo censors. If this is true, then the amount of time Weibo posts are visible may increase in duration before being removed.

## Methods

Sina Weibo, the research object in this study, is a Twitter-like microblogging platform with 242 million accounts as of June 2016. It had 249 million accounts at the time of the Occupy Movement<sup>2</sup>. It has been an online debate platform for common concerns and emergencies, addressing matters such as air pollution and earthquakes (Rauchfleisch & Schäfer, 2015).

Weiboscope is the primary source of data for this study. This is a Chinese microblog data collection and visualization project developed by the Journalism and Media Studies Centre at HKU, which has gathered posts censored by Weibo via Sina Weibo's Open API since 2011. The data derived from Weiboscope were stored in a Microsoft Excel spreadsheet document prior to any further data processing. The data recorded six elements, including the content of the post, an English translation of the content, the user ID associated with the deleted Weibo post, the post release time, the time the post was deleted, and any embedded pictures attached to the original post. In the following processing stages, this study primarily employs the content analysis method to produce quantitative accounts (Bryman, 2012) from the raw material of both the text and the embedded image content of censored posts. This method requires a human investigator or coder to participate in the coding process. The preliminary study (also called "the pilot study") hopes to evaluate the research design of this thesis and provide insights for a full-scale study. After this coding sequence, one crucial variable—in this case, the *sensitive terms* for censorship—will be extracted. Keyword extraction primarily employs a computer-assisted approach by using ROST CM 6 to segment Chinese text, measure the frequency with which keywords appear, and calculate the deletion rates of sensitive keywords.

## Data collection

This study gathered two months of censored posts from September 28, 2014 until November 28, 2014 from the Weiboscope social media timeline on Twitter, where the Weiboscope project automatically publishes recently censored posts from Sina Weibo on their Twitter and Facebook accounts in order to provide the public with an opportunity to access sensitive information deleted by Chinese authorities. It automatically monitors the timelines of certain groups of microbloggers and sends updated notifications about posts that have recently been deleted by the Weibo censors. Unfortunately, data between October 12 and October 20 were missing due to a hardware failure of the data collection server; only two posts were collected from October 5 and October 20.

Nonetheless, Weiboscope recorded two months of data, totaling 2,336 articles of censored Weibo posts. These 2,336 censored posts not only contain content related to Occupy

Central but also censored posts pertaining to other topics. As this study seeks to analyze censorship practices in response to Occupy Central, it is essential to filter out the irrelevant posts. Using manual data categorization procedures, the collected posts were placed into two groups. Group 1 contained censored posts that featured the Occupy Movement, and Group 2 consisted of censored posts on other topics. The sample sizes of Group 1 and Group 2 are 1,195 (51.2%) and 1,141 (48.8%), respectively. In this study, Group 1 is the main research object, while Group 2 will only be involved in extracting sensitive keywords for the research analysis.

## Content analysis

This study primarily employs the content analysis method to produce quantitative accounts (Bryman, 2012) from the raw material of both the textual content and the embedded image content of censored posts. This process focuses on developing the tentative coding manual according to the parameters listed in the tentative coding schedule, clarifying variables, identifying data types, and completing the category lists for the variables.

*Content analysis*, according to Berelson's definition, is a research technique for an objective, systematic, and quantitative description of the content within communicative media (Berelson, 1952). This definition suggests that, by implementing clearly specified rules in a consistent manner, the content analyst's personal biases in the analysis process will be limited; furthermore, the aim of content analysis is to produce quantitative accounts and interpret the meanings of the raw material (Bryman, 2012). The process of creating codes was guided by principles stipulating that the codes should be mutually exclusive, exhaustive, and independent (Matthes & Kohring, 2008).

In this study, the units of analysis are the censored posts obtained from Weiboscope, and the coding of these posts has been conducted by one coder.<sup>3</sup> Although the 1,195 censored posts do not amount to an overwhelming quantity of data to handle, especially when compared with existing studies on censorship (Bamman et al., 2012; Fu et al., 2013; King et al., 2013; Zhu et al., 2012), it is still advisable to conduct a *pilot study*, a mini-version of the full-scale study (Teijlingen & Vanora Hundley, 2002), to test the coding schedule and coding manual and to test the feasibility of the research design being used before conducting a full-scale study.

## Pilot study

To some degree, conducting a preliminary study could avoid wasting considerable human effort in coding infeasible variables or following ambiguous coding guidance. In addition, Teijlingen and Vanora Hundley (2002) believed that pilot studies are a crucial element of good study design that provides valuable insights for researchers to evaluate the feasibility of the variables being accounted for. The sample size of a pilot study is generally

set to be ten percent of the total sample required for a full study (Hertzog, 2008). Thus, following this guideline and using a random sampling method, 120 censored posts were chosen, which represents ten percent of the 1,195 posts from Weiboscope that concern the Occupy Movement in Hong Kong (Group 1). The pilot sample of censored posts is randomly selected using Excel 2013. All the censored posts collected should be translated into simplified Chinese script, removing all emoticons, URLs, and “@usernames” from the text (Fu et al., 2013; Zhu et al., 2012).

There are problems with using the tentative coding scheme to code pilot samples, which may be categorized this way: (a) incomplete category lists, (b) missing some variables, and (c) a lack of clear coding criteria. After solving these problems, a final version of the coding scheme for this full-scale study has been conducted, see Table 1.

## Analysis

The full-scale data analysis in this section mainly provides univariate data analysis on three registration variables, such as *post duration*. Figure 1 (p. 89) illustrates the distribution of the daily and hourly rate of deletion. Figure 2: Histogram (p. 90) deals with the survival time of the censored posts (their duration) before they were censored.

The first bar chart (Figure 1) shows that there is a general decrease in the number of censored posts despite the occurrence of small fluctuations during the two months of democratic protests— it must also be remembered that more than ten days of data are missing as mentioned in the previous section. This decline in the number of Occupy-related posts could account for the failure of offline protests to maintain momentum.

The duration histogram for censored posts, seen in Figure 2, generally follows a normal distribution (mean = 166, mode = 48, median = 83, SD = 206). It is obvious that the majority of posts have a duration period that lasts from 0 to 120 minutes. 34% of Occupy Movement-related posts were deleted within one hour; 49.54% were deleted within 80 minutes; and more than 90% of the posts were deleted within 400 minutes (less than 7 hours). These data findings share some similarity with Zhu’s data, which indicated that 30% of deletion occurs within 30 minutes (2013).

## Exploring visual content and textual content

The main goal of this section is to compare the visual and textual content variables proposed in Table 1 (p. 97). There are *eight* variables pertaining to the embedded pictures (visual content), and *five* variables (excluding the *sensitive terms* and *languages*) addressing textual messages in Weibo posts. Among those variables, there are *five* pairs of variables such as *image relevance* vs. *text relevance* that outline the similarity or difference between the content of these two parts, as shown in Figure 3: Visual and textual content duplicate (p. 91), Figure 5: Visual and textual content themes (p. 92), Figure 6: Visual and textual con-

tent relevance (p. 92), Figures 7 and 8: The words/ characters contained in visual and textual content (p. 93-94), and Figure 4: Attitude affiliation difference (p. 91). The three remaining content variables are *image sources* (Figure 9, p. 94), *image obtaining* (Figure 11, p. 95) and *image origins* (Figure 10, p. 95).

### ***The five pairs of content variables***

It was observed in the pilot study that the pictures within the censored posts carry more information than the textual content and that microbloggers tend to demonstrate viewpoints clearly through visual content rather than in the textual content. The reason behind this may be due to microbloggers who believe that a picture is a better way to bypass Chinese social media censorship.

One interesting phenomenon among the post content is the act of duplication – especially, with regard to visual content (Figure 3). It is obvious that the duplication rate of images (20.84%) is significantly higher than the duplication rate for text content (3.93%) even after excluding the duplication action known as “分享图片 (share photos)”. The reason for this situation could be due to microbloggers saving the protest photographs that were first published by other users and re-posting them again to disseminate sensitive information instead of simply forwarding the original posts. The reason behind this re-post action is to serve as a kind of backup that ensures the image is preserved in order to prevent its disappearance if the original post is deleted. It seems that visual content is perceived by microbloggers as containing the bulk of important information rather than textual content.

Figure 4 examines the attitude affiliation differences between the visual and textual contents. Almost one-third of the textual content conveys an ambiguous and unclear attitude (32.8%) towards the protests, whereas only 5.77% of visual content displayed the same sort of ambiguity in their attitudes towards the Occupy Movement. It is not surprising to find that the majority of censored posts support the Occupy Movement in Hong Kong with 53.47% of visual content and 37.15% of textual content displaying a supportive attitude.

The problem of unclear and ambiguous attitudes in textual content also occurs in the *content themes* and *content relevance* variables (Figure 5 and Figure 6). Almost one-third of the textual content (32.30% in *content themes* and 24.77% in *content relevance*) could not be categorized. This phenomenon probably indicates that the coding scheme may not be mutually exhaustive enough, which requires more refinement. In *content themes* (Figure 5), if the “unclear” category is ignored, the data distributions for the two types of content have a structural similarity. However, this similarity cannot be applied to the distribution of data for *content relevance* (Figure 6). In terms of relevance, nearly one-third (28.20%) of the textual content is considered to be “moderately relevant,” the largest portion of this variable. By contrast, over half of the visual content (54.81%) is considered to be extremely relevant to the Hong Kong protests.

The length of text in the censored posts varies between 0 and 84 Chinese characters (including punctuation), see bar chart Figure 7. This chart basically follows a bell curve structure. The full-scale study has found that the textual content of censored posts differs greatly – from using several meaningless words to using sentences that resemble news headlines. The longest texts, containing 82 and 83 characters, are as long as a news headline. Among the 103 posts consisting of only four Chinese characters, 67 of them are “分享图片 (share photos)”, which accounts for 65% of these short posts. The average text length consists of 29.65 characters (SD = 27.36). As expected, the dominant language is Chinese, including both traditional and simplified Chinese script, which accounts for 97% of the total data set.

### ***The three remaining content variables***

The univariate analysis of the three variables, *image sources*, *image origins*, and *image obtaining* are demonstrated in Figure 9, Figure 10 and Figure 11. More than half (58%) of the censored posts with images contain a text format message, which supports the assumption that microbloggers have a tendency to use images to convey sensitive information. Almost one-third (29.1%) of the pictures are from recognizable news agencies, among which 83.8% are from Hong Kong sources and local news agencies such as Now News, hkuhash.com, *Apple Daily*, *Passion Times*, HKFS/Scholarism/OCLP, D100, inmediahk.net, on.cc, TVB/ATV and other Hong Kong local media. In fact, the majority of the pictures (44.3%) are not from any registered news agency and are actually taken by the individual users themselves. As illustrated in Figure 10, more than one-third of the images were originally published on online/social media platforms such as Facebook or Twitter. Only 8% of the pictures in censored posts were first published in traditional media, such as television or newspapers. From Figure 11, more than half (65%) of the visual content was obtained by saving sensitive images from other sources (and, as such, are considered to be in the re-post category) and from capturing screenshots from computers and smartphones. The rest are photos taken by the microbloggers themselves.

The data of this univariate analysis, as demonstrated above, clearly claims that the embedded pictures of censored posts are, indeed, very informative and that microbloggers tend to demonstrate their viewpoints clearly through visual content rather than in the textual content.

## **Result**

### ***The effectiveness of Weibo users' novel ways to circumvent Weibo censorship***

Hypothesis 1 analyzes whether Weibo users prefer to convey more information and express explicit attitudes in the visual content opposed to the textual content when they disseminate politically sensitive material.

From Table 2, it is obvious that these two variables, *attitude affiliation of textual content* and *attitude affiliation of visual content*, have no significant correlation with Spearman's  $\rho = 0.034$ ,  $N = 1184$ ,  $p = 0.236$ . However, when the category of "unclear" is filtered out, a significant correlation emerges for these two variables, as seen in Table 3, with Spearman's  $\rho = 0.220$ ,  $N = 794$ ,  $p = 0.000$ . The reason for this could be that the textual content in the censored posts is not as clear and direct as in the pictures embedded within these posts since almost one-third of the posts with textual content convey an unclear attitude, as demonstrated in Figure 4. If the attitude of both pictures and text is clearly expressed, then there is a mild positive correlation (with a correlation coefficient of 0.22) between these two variables evaluating attitude affiliation. This indicates that the visual content of a post (such as in embedded pictures) is more informative and capable of conveying an explicit attitude or the users tend to use vague text to prevent being automatically censored.

Moreover, Table 4 demonstrates that there are negative correlation coefficients between the *number of words in the embedded pictures* and the *length of text* with Spearman's  $\rho = -0.117$ ,  $N = 1184$ ,  $p = 0.000$ . In other words, the negative correlation between these two variables is not strong. It could be interpreted that the more words there are in the embedded pictures, the fewer the characters will be used in that post's textual content. This indicates that Weibo users prefer to convey more information through embedded pictures than in the textual content. Altogether, Hypothesis 1 is confirmed.

As observed in the pilot study, there are similarities between some discrete user accounts. Based on this observation, the variable of *user ID activeness* integrates similar user ID accounts and calculates the frequency of their occurrence (Figure 13). The vast majority (95.50%) of microbloggers post no more than five times on Occupy Central, whereas most users (71.78%) only post once about the topic. As illustrated in the chart (Figure 13, p. 96), only a few Weibo users posted more than five sensitive posts during the protest. *User ID uniqueness*<sup>4</sup> (Figure 12, p. 96), analyzes how many posts have been published by original user IDs. Similar to the data distribution of *user ID activeness*, the majority of user accounts (70.95%) only posted once about the Occupy protests. To illustrate, the distribution differences between *user ID uniqueness* and *user ID activeness* indicate that there are some Weibo accounts that are closed by the Weibo censors.

Hypothesis 2 examines whether sensitive keywords whose presence in a Weibo user ID would have an impact on that post's duration. Six user ID keywords<sup>5</sup> have been determined, but only one keyword, *Occupy*, has an impact on post duration. In order to examine Hypothesis 2, independent-samples t-tests were conducted to compare *Post Duration* in conditions where there were keywords to conditions where there were no keywords (Levene's Test  $p < 0.05$ ,  $t$ -test  $p = 0.000$ ). There was a significant difference in the scores for the conditions containing keywords ( $M = 66.65$ ,  $SD = 21.317$ ) and those with no keywords ( $M = 166.79$ ,  $SD = 207.419$ ) with scores of  $t(14.538) = -9.958$ ,  $p = 0.000$ . These results suggest that the keyword *Occupy* has a significant effect on the duration of these posts, whereas

the other five keywords have no significant effect on post lifetime. Thus, Hypothesis 2 is partly supported.

Hypothesis 3 analyzes the extent to which the protest activists try to create new Weibo accounts to overcome the challenge of their user ID being closed in order to prolong a Weibo post's longevity.

Table 5 demonstrates that there is a positive correlation between *user ID activeness* and *Post Duration*, seen from Pearson's  $r = 0.057$ ,  $N = 1195$ ,  $p = 0.050$ ; and there is also a negative correlation between *user ID uniqueness* and *Post Duration*, seen from Pearson's  $r = 0.077$ ,  $N = 1195$ ,  $p = 0.008$ .

These two sets of figures indicate that there is a weak positive correlation between *user ID activeness* and *Post Duration* but that there is also a weak negative correlation between *user ID uniqueness* and *Post Duration*. This difference indicates that, with the continuation of the Occupy Central Movement, the more sensitive posts published by a Weibo account, the shorter the post's duration on that Weibo account (in other words, the faster it is deleted), which means that the Weibo user's account is monitored by Weibo censors. To overcome the challenge of posts being censored faster than usual, protest activists could create new Weibo accounts to escape the tracking of Weibo censors. Thus, Hypothesis 3 is confirmed.

Hypothesis 4 analyzes whether the supporters of the protest (the "activists") will continue to publish related sensitive information when the Occupy protests lose momentum with a decreasing amount of posts related to the Occupy Movement. As demonstrated in Figure 1, there was, indeed, a general decrease during the two months of the number of censored posts despite the occurrence of small fluctuations in this figure.

Table 6 shows that there is a positive correlation between *user ID activeness* and *Post Date*, seen from Pearson's  $r = 0.347$ ,  $N = 1195$ ,  $p = 0.000$ ; and there is also a positive correlation between *user ID uniqueness* and *Post Date*, seen from Pearson's  $r = 0.097$ ,  $N = 1195$ ,  $p = 0.001$ . These two sets of figures indicate that there is a weak positive correlation between *user ID activeness* and *Post Date* but that there is also a weak positive correlation between *user ID uniqueness* and *Post Date*. These two sets of figures indicate that, with the continuation of the Occupy Central Movement, the supporters of the protest will more actively publish related sensitive information in general; however, the difference between these two correlation coefficients could be interpreted to mean that the "activists" (*user ID activeness*) are genuine protests supporters, who will create new Weibo accounts once their original ones have been tracked or closed by Weibo censors. Despite the difference between these two sets of figures, one could assume that, with the continuation of the Occupy Central Movement, the more posts published by Weibo users, the more solidarity the activists possess. Hypothesis 4 is supported.

## Weibo censorship practices during a concrete event

### *The influence of sensitive terms on Weibo Post Duration*

'Sensitive terms' designates an aggregated variable, which adds up the frequency for all 21 sensitive keywords<sup>6</sup> ( $\alpha = 0.608$ ,  $n = 1195$ ,  $N = 21$ ). The score of Cronbach  $\alpha$  is acceptable though it is lower than 0.7. Hair (2006) noted that Cronbach's alpha is acceptable when it is over 0.6 in exploratory research.

Hypothesis 5 examines whether, with the increase in the number of sensitive keywords, the duration of Weibo posts will be reduced. As demonstrated in Table 7, there is a negative correlation coefficient between *sensitive terms* and *Post Duration* with Spearman's  $\rho = -0.061$ ,  $N = 1195$ ,  $p = 0.36$ . There is a relatively weak negative correlation between these two variables. It could be interpreted that the more sensitive terms a Weibo post contains, the shorter the duration time for these Weibo posts. Thus, Hypothesis 5 is supported.

### *Weibo censors' changing practices*

Occupy Central erupted on September 28, 2014 when tensions peaked between police and protesters after the Hong Kong riot police used tear gas to dispel protesters<sup>7</sup>. Surprisingly, the most prominent official news agencies in China did not remain silent on this issue and reported about the pro-democracy movement right after its outburst (though from a biased perspective), which made the protests less mysterious and less sensitive to the general public. After the first week, it seemed that the Occupy Central Movement had reached a deadlock without any constructive achievements. It was ended in the middle of December 2014 after the police removed the last groups of activists. In other words, throughout the development of Occupy Central, the protest was gradually judged to be less sensitive by the Weibo censors. Hence, the duration of Weibo posts related to Occupy Central was increased with the continuation of the protest.

Hypothesis 6 stipulates that, as Occupy Central developed over time, the material pertaining to this protest would be considered less sensitive by the Weibo censors; thus, the post duration of Occupy Central-related posts would increase with the continuation of the protest. Table 8 demonstrates that there is a positive correlation coefficient between the variables of *Post Date* and *Duration* with Pearson's  $r = 0.401$ ,  $N = 1195$ ,  $p = 0.000$ . This means there is a strong, positive correlation between these two variables. It could be predicted that with the continuation of the Occupy Central Movement, these sensitive posts would survive relatively longer than at the beginning of the demonstration. Thus, Hypothesis 6 is confirmed.

## Discussion, limitations, and conclusions

This study emphasizes *how* microbloggers circumvent Internet censorship to disseminate sensitive information. Results uncover *the novel ways* Weibo users try to circumvent Weibo censorship and confirm the *effectiveness of these new methods* in bypassing censorship.

### ***The irrelevance of visual and textual content***

The main research method used to analyze embedded pictures was to compare them with their corresponding textual content. The most outstanding feature in the comparison of these two things is the irrelevance of the visual content *compared to* the textual content, which indicates that Weibo users have a tendency to use images, instead of text to convey sensitive information as a means to reduce the risks of their posts being deleted.

### ***The duplication of the image***

About 41% of the embedded pictures in this study had been obtained by users saving sensitive images from other posts; the duplication rate of visual content is dramatically higher than it is for textual content with the former rate at 20% but the latter rate only at 4%.

It becomes much clearer that embedded pictures play a crucial role in disseminating politically sensitive information and have the ability to convey explicit political opinions and commentary beyond what the textual content can express. This is due to Weibo users' understanding that "keyword checking" in the textual content is one of the most prevalent censorship methods on the Weibo site. Based on this kind of knowledge of censorship practices, Weibo users have to use ambiguous terms or create new terms to express their political opinions in Weibo texts when they disseminate banned material, whereas the microbloggers camouflage the sensitive information being shared in pictures format to escape direct text content censorship.

This novel way of disseminating sensitive material might have been an effective way to bypass online censorship to a certain degree, but the Weibo censors upgraded their information filtering methods from simply deleting sensitive material to monitoring Weibo accounts that garner numerous shares from other users. Then, they delete the sensitive ones.

### ***Monitoring specific Weibo users and blocking user accounts***

Both Li (2009) and Zhu et al. (2013) mentioned that Internet users who constantly visit sites and posts containing sensitive information would be monitored by institutions tasked with censorship. Moreover, Zhu et al. (2012) suggested that Weibo might pay more attention to microbloggers who have been censored before.

As this study analyzes user reaction to censorship, the user ID is a key variable for studying the behavior of microbloggers. There are two variables that are directly concerned with the Weibo users themselves, which include *user ID activeness* and *user ID uniqueness* (Zhu et al., 2012, 2013). Once a user ID is blocked by the Weibo censors, the user will probably create a new ID, often a variant version of the original one, to continue publishing sensitive information. These persistent users could be labeled as "activists" or, at least, as "online activists". These activists are the genuine supporters of the Occupy Movement. One may assume that this group of Weibo users will consistently support the Hong Kong protests even though there is no significant progress being made by the protesters.

### ***Search filtering and keywords in Weibo IDs***

Zhu et al. (2012) found that users could not use the search function provided by the Weibo platform to search for “sensitive keywords” and access relevant information but that the user IDs, which contain such sensitive keywords, could be found. This might encourage these “online activists” to modify their ID names or create a new ID that contains relevant terms to be searched. Hypothesis 2 finds that *one* of the six candidate keywords, “Occupy”, has had a statistically significant effect on post lifetime. Moreover, Hypotheses 3 and 4 have emphasized exploring a user ID’s influence on Weibo post deletion and focused on whether the degree of activity a user ID has correlates with *Post Duration* and *Post Date*.

Using user IDs to carry sensitive keywords is definitely an innovative way to get around Weibo’s information search filtering and could be reached by other users who are searching for banned terms. The purpose of examining Hypotheses 3 and 4 is to analyze Weibo users’ motives through these two variables in order to determine whether the Weibo user is a genuine protests supporter or a bystander. The users who have persistently created new accounts when the old ones have been blocked are definitely considered to be “activists” in reality, whereas the remaining users are labeled as “bystanders.”

### ***Sensitive Terms***

Although many previous studies have explored the influence of sensitive keywords with respect to Weibo post deletion, this study explores whether the *number* of keywords in a post would increase the speed with which the post is deleted. This suggestion has been supported by the confirmation of Hypothesis 5; and, although the correlation coefficient score is not impressive, the finding still has statistical significance, which means that the duration of a post will decrease as the number of sensitive keywords increases.

## **Limitations**

There are some inevitable limitations embedded in the data samples and coding process that may undermine the validity of this study. First, the data source is not a random sample from the whole Sina Weibo population, which monitors a list of prioritized Weibo users composed of microbloggers who likely experience the highest level of censorship in cyberspace because they often deal with “sensitive topics” in the Chinese context, tackling issues such as anti-authoritarianism (Fu et al., 2013).

Second, this study does not deal with uncensored posts from the same time period as the Occupy protests, which could serve as a control group in this study. The data source of this study only provides information about posts that have already been deleted.

Finally, although this study has a clear coding scheme, containing specific rules that enable the content analyst to code the censored posts systematically, it could not entirely eradicate the influence of the coder’s personal bias. Moreover, this study has been under-

taken by only one coder, which means that the inter-coder reliability test cannot be applied here, a crucial element in the content analysis method (De Swert, 2012).

## Conclusion

The findings of this study demonstrate how social media users attempt to invent new tactics to challenge existing censorship practices and indirectly undermine the established censorship system. Moreover, this study only provides quantitative evidence that resistant Weibo users employ pictures and their ID names to disseminate sensitive material in spite of heavy social media censorship, but qualitative studies are lacking in terms of exploring resistant behaviors by social media users from a bottom-up perspective. It would contribute to the social media censorship research area if there were a qualitative research study analyzing a case from the micro-level.

## Notes

- 1 OCCUPY CENTRAL – DAY 12: Full coverage of the day's events (October 18, 2014). Retrieved September 7, 2015, from <http://www.scmp.com/news/hong-kong/article/1612602/live-democracy-advocates-urge-unity-occupy-movement-enters-12th-day?page=all>.
- 2 Data from <http://www.cnnic.net.cn/>
- 3 Many coding analyses require at least two coders; because this study is an individual thesis as opposed to a group project, there is only one coder.
- 4 *User ID Uniqueness* calculates different user ID occurrences; *user ID activeness* calculates user ID occurrences after combining the ID variations with their original IDs – for instance, “Erhei’s wife 008”, “Erhei’s wife 009” and “Erhei’s wife” will be categorized as “Erhei’s wife”.
- 5 Keywords: *Hong Kong, umbrella, ribbon, disobedience, occupy, and HK.*
- 6 The 21 sensitive keywords: H\*K, occupy, Central, chief executive, CY Leung, Hong Kong Federation of Students (HKFS), police force, universal suffrage, action, attack, clearance, defend, demonstration, government, headquarter, person, populace, protest, protester, step down, Ultimatum.
- 7 Hong Kong: Tear gas and clashes at democracy protest – BBC News. (2014, September 28). Retrieved September 13, 2015, from <http://www.bbc.com/news/world-asia-china-29398962>.

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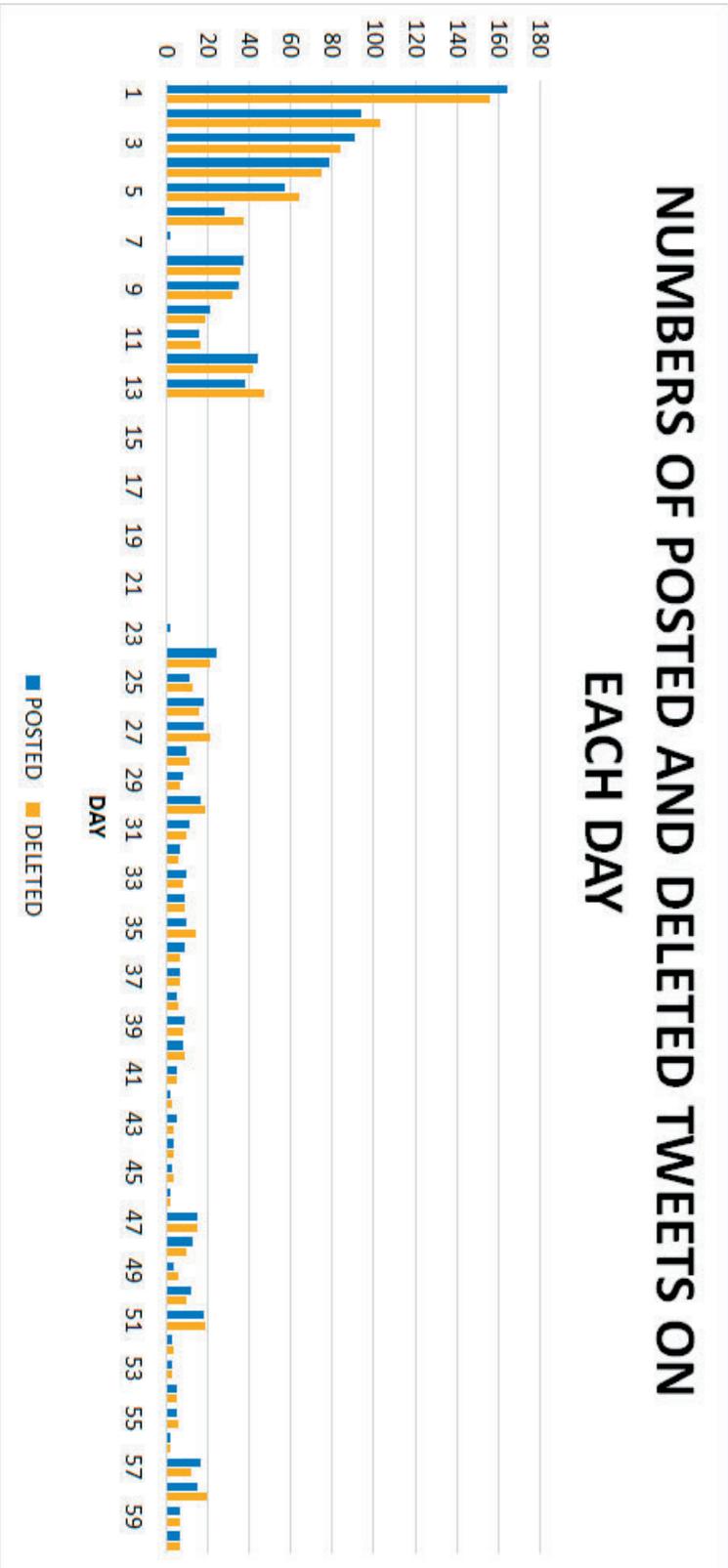


Figure 1. Daily Distribution of the Release and Deletion Times of Censored Posts

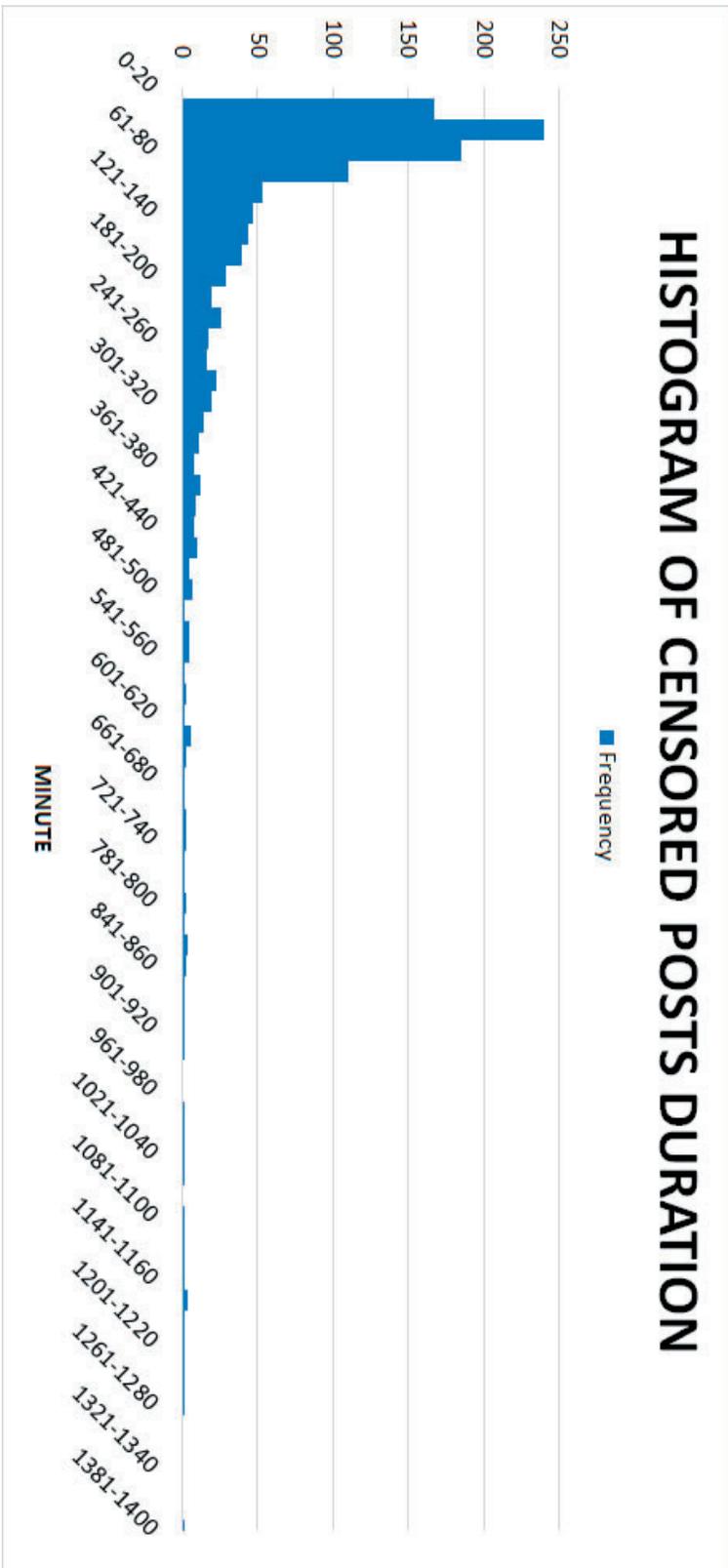


Figure 2. Censored Posts Duration

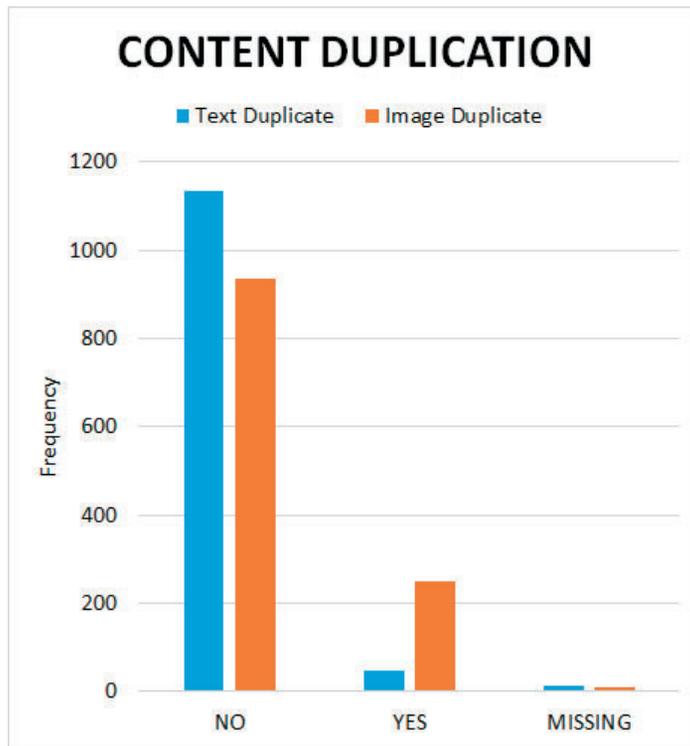


Figure 3. Visual and Textual Content Duplicate

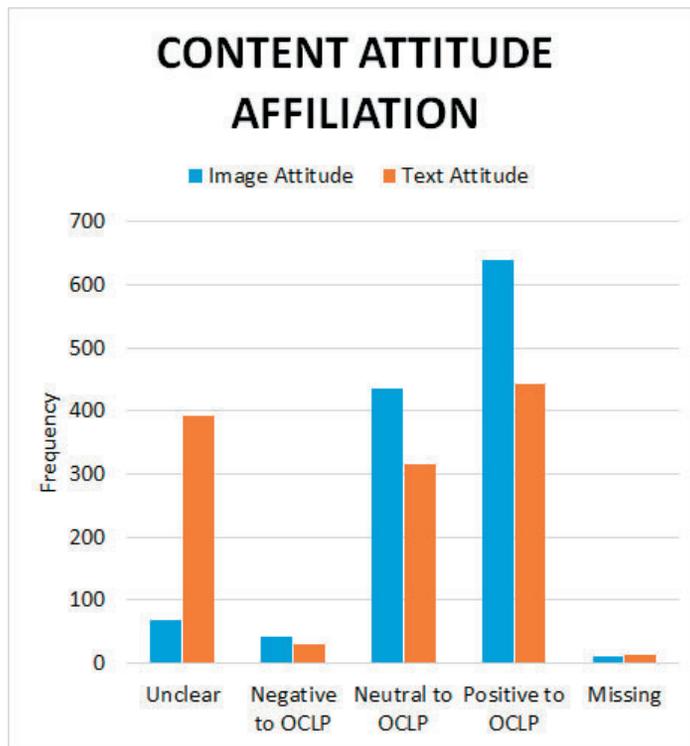


Figure 4. Visual and Textual Content Attitude Affiliation

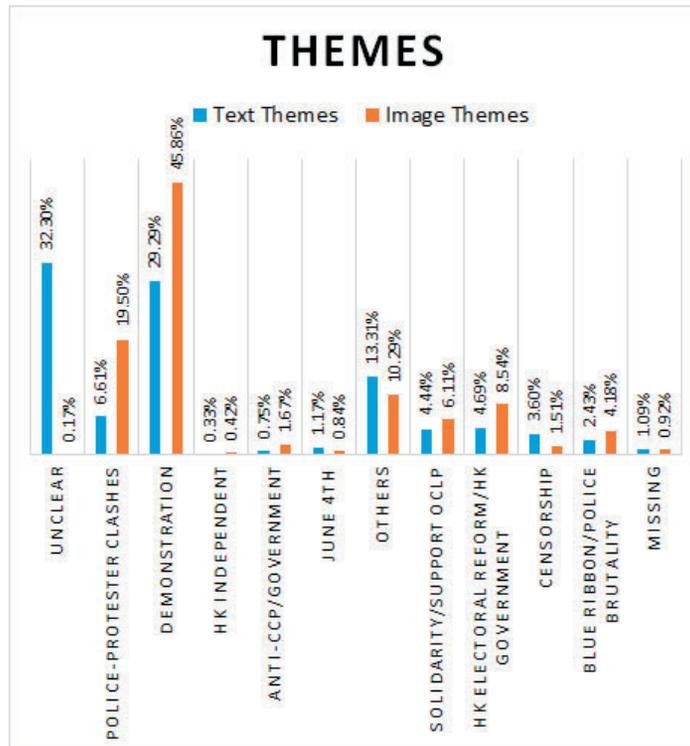


Figure 5. Censored Posts' Visual and Textual Themes

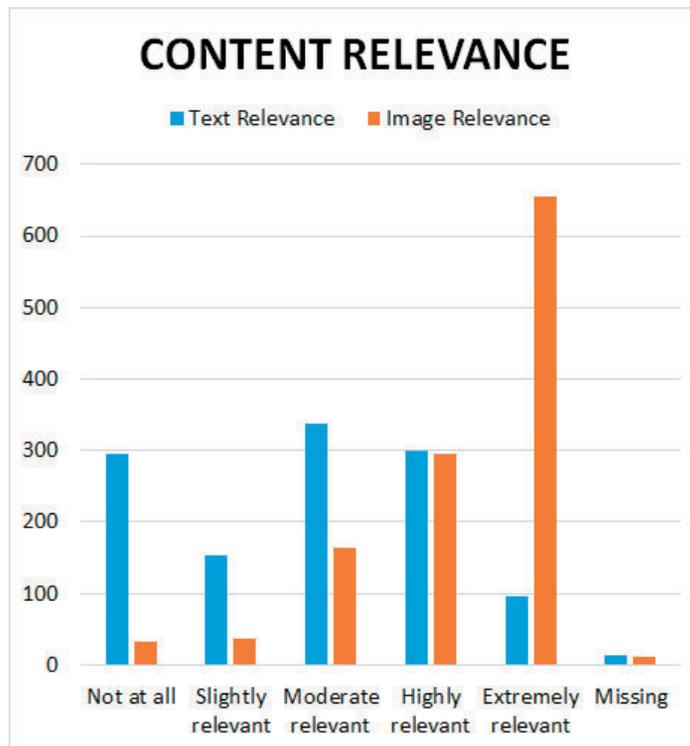


Figure 6. Visual and Textual Content Relevance

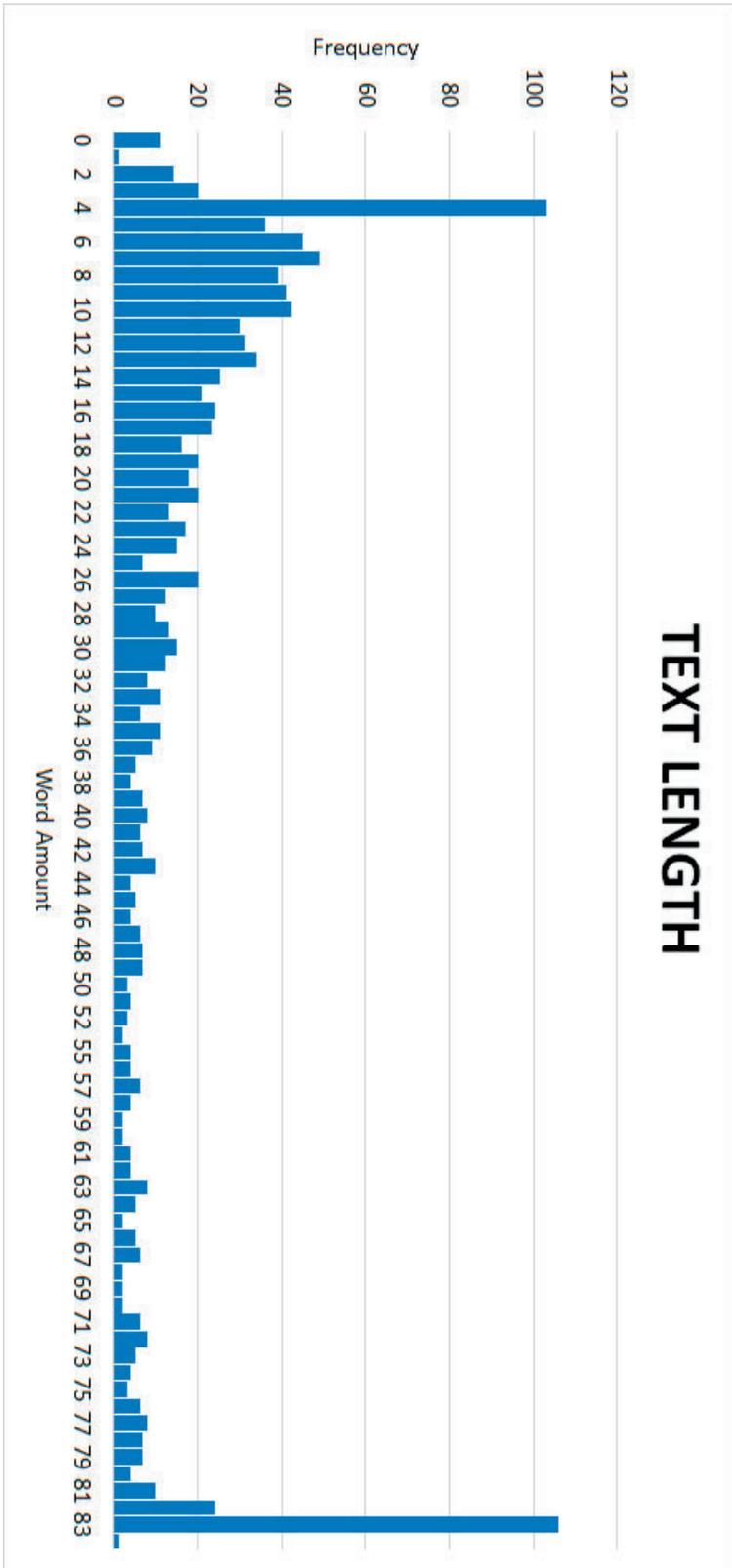


Figure 7. The Length of Text Content of Censored Posts

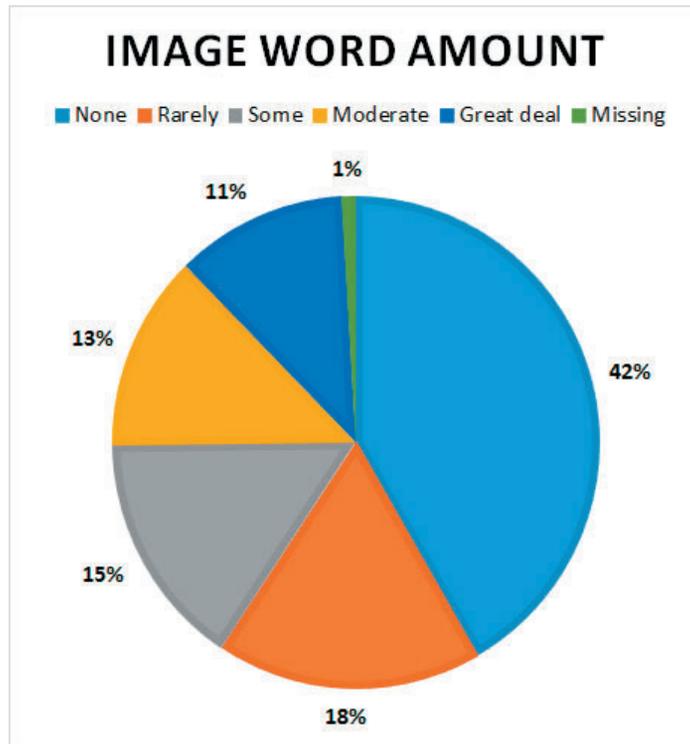


Figure 8. Number of Words in Pictures

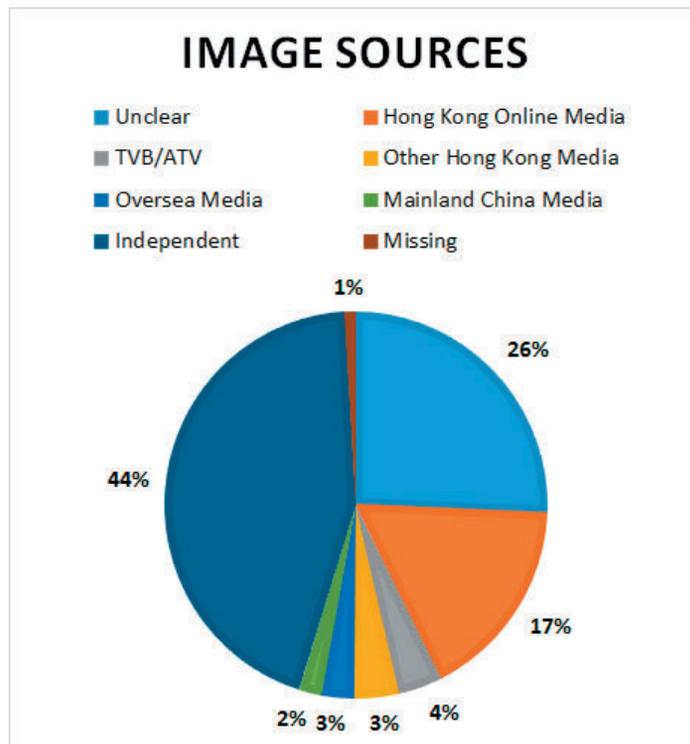


Figure 9. News Media Agencies Sources

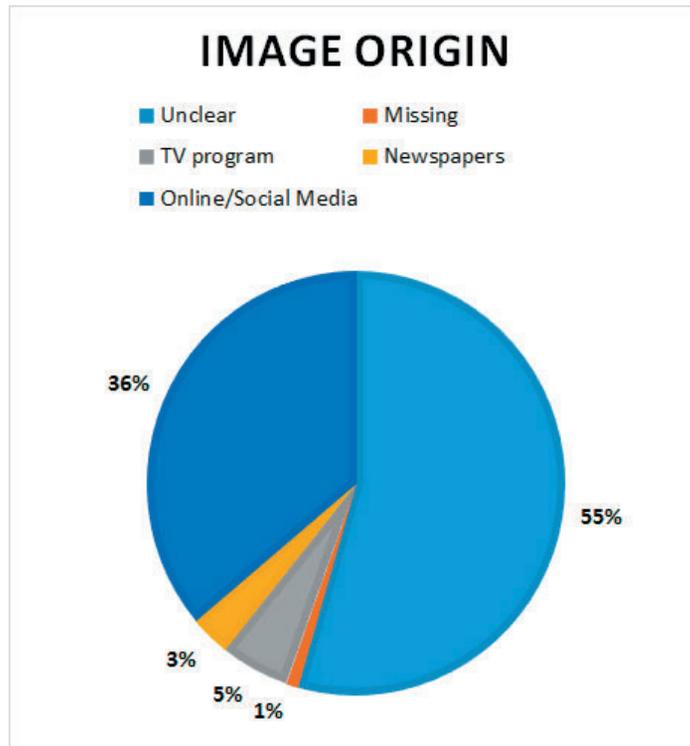


Figure 10. Image Origins of Embedded Pictures

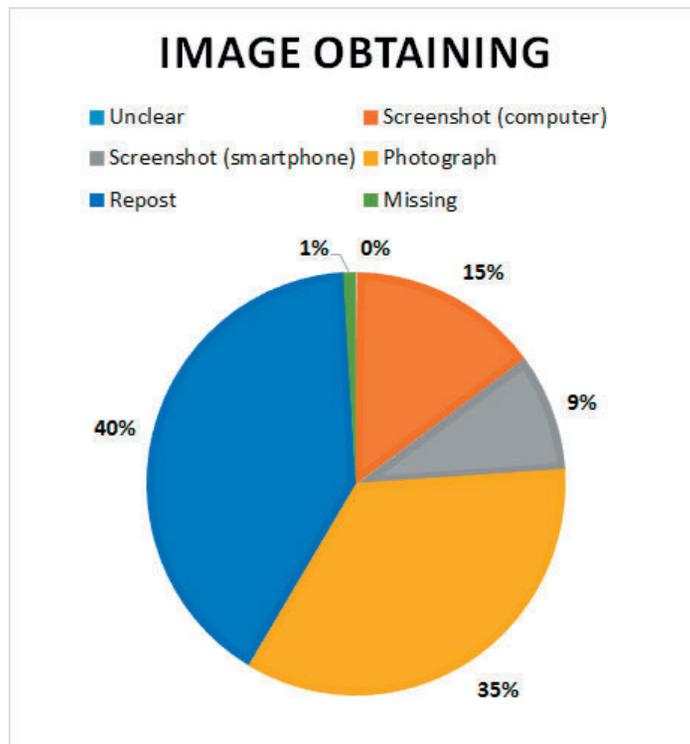


Figure 11. Image Obtaining of Visual Content

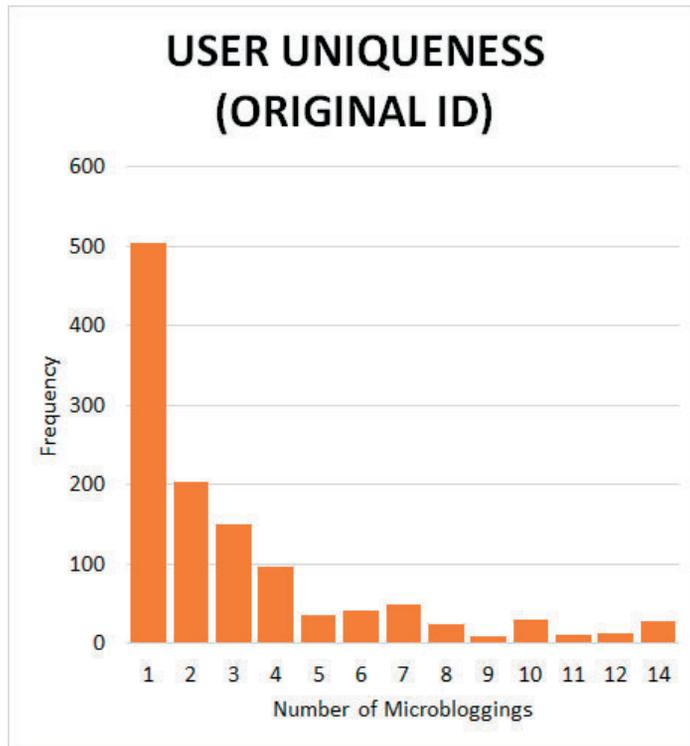


Figure 12. User ID Uniqueness

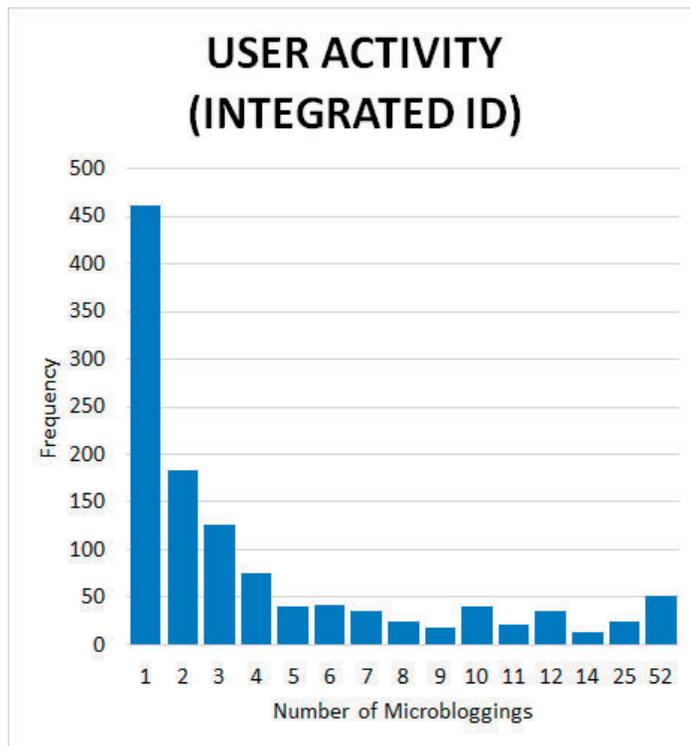


Figure 13. User ID Activity

DATA TYPE	VARIABLE	CATEGORY LIST
Textual content		
dichotomous	text duplicate	1-Yes, 0-No
ordinal	text relevance	1-Not at all, 2- slightly relevant, 3- moderately relevant, 4-highly relevant, 5- extremely relevant
nominal	text themes	0-unclear or could not identify, 1-Violent clashes between protesters and police, 2-demonstrations, 3- Hong Kong independence, 4-anti-Chinese Communist Party sentiments, 5-Tiananmen demonstrations in 1989, 6-others, 7-solidarity/support, 8-Hong Kong electoral reform/Hong Kong government, 9-censorship, 10-blue ribbon/police brutality
nominal	languages	0-unclear or could not identify, 1-traditional Chinese, 2-simplified Chinese, 3-English
scale	the length of the text	(varies from 0 to 85 Chinese characters)
ordinal	textual attitude affiliation	0-unclear or could not identify, 1-negative to OCLP, 2-neutral to OCLP, 3-postive to OCLP
scale	sensitive terms*	
visual content		
dichotomous	image duplicate	1-Yes, 0-No
ordinal	image relevance	0-unclear or could not identify, 1-Not at all, 2- slightly relevant, 3- moderately relevant, 4-highly relevant, 5- extremely relevant
nominal	image themes	0-unclear or could not identify, 1-Violent clashes erupt between protesters and police, 2-demonstrations, 3- Hong Kong independence, 4-anti-Chinese Communist Party sentiments, 5-Tiananmen demonstrations in 1989, 6-others, 7-solidarity/support, 8-Hong Kong electoral reform/Hong Kong government, 9-censorship, 10-blue ribbon/police brutality
nominal	image obtaining	0-unclear or could not identify, 1-screenshot (computer), 2-screenshot (smartphone), 3- photos taken by user and 4-repost
nominal	image sources	0-unclear or could not identify, 1- hkdash.com, 2-Apple Daily, 3-Passion Times, 4-HKFS/Scholarism/OCLP, 5-D100 Hong Kong Radio, 6-inmediahk.net, 7- now news, 8-on.cc, 9- TVB/ATV (TV Program), 10-other Hong Kong media, 11-overseas media, 12-mainland China media, 13- photos taken on the scene of OCLP
nominal	image origins	0-unclear or could not identify, 1-Facebook, 2-Twitter, 3-, 4-Websites, 5- Instagram, 6-TV Program, 7- newspapers, 8- WeChat
ordinal	number of words in the pictures	1-None, 2-rarely, 3-some, 4-moderate, 5-a great deal
ordinal	visual attitude affiliation	0-unclear or could not identify, 1-negative to OCLP, 2-neutral to OCLP, 3-postive to OCLP
Registration information		
scale	case number**	N
scale	post date	The nth day
scale	post time	N hr M min
scale	delete date	The nth day
scale	delete time	N hr M min
scale	post duration	N minutes
scale	user ID uniqueness	N times

Table continues on following page >>

DATA TYPE	VARIABLE	CATEGORY LIST
scale	user ID activeness	N times
dichotomous	user ID keyword HK*	1-Yes, 0-No
dichotomous	user ID keyword Hong Kong*	1-Yes, 0-No
dichotomous	user ID keyword umbrella*	1-Yes, 0-No
dichotomous	user ID keyword ribbon*	1-Yes, 0-No
dichotomous	user ID keyword occupy*	1-Yes, 0-No
dichotomous	user ID keyword disobedience*	1-Yes, 0-No

One asterisk (“\*”) indicates that the variable’s category list has been modified.  
 Two asterisks (“\*\*”) indicates that the variable is newly added.  
 The missing data will be denoted as “999”.

Table 1. Final version of Coding manual (29 variables)

Correlations

			attitude affiliation of the visual content	attitude affiliation of the textual content
Spearman's rho	attitude affiliation of the visual content	Correlation Coefficient	1.000	.034
		Sig. (2-tailed)	.	.236
		N	1184	1184
	attitude affiliation of the textual content	Correlation Coefficient	.034	1.000
		Sig. (2-tailed)	.236	.
		N	1184	1195

Table 2. Correlations between attitude affiliations of visual content and attitude affiliations for textual content Correlations

Correlations

			attitude affiliation of the visual content	attitude affiliation of the textual content
Spearman's rho	attitude affiliation of the visual content	Correlation Coefficient	1.000	0.220**
		Sig. (2-tailed)	.	.000
		N	794	794
	attitude affiliation of the textual content	Correlation Coefficient		1.000
		Sig. (2-tailed)	.000	.
		N	794	803

\*\* Correlation is significant at the 0.01 level (2-tailed).

Table 3. Correlations between visual content attitude affiliation and textual content attitude affiliation after excluding the “unclear” category in textual attitude

Correlations

			text amount in pictures	Length
Spearman's rho	text amount in pictures	Correlation Coefficient	1.000	-0.117**
		Sig. (2-tailed)	.	.000
		N	1184	1184
	Length	Correlation Coefficient		1.000
		Sig. (2-tailed)	.000	.
		N	1184	1195

\*\* Correlation is significant at the 0.01 level (2-tailed).

Table 4. Correlations between number of words in pictures and the length of text

*Correlations*

		Duration	ID Uniqueness	ID Activeness
Duration	Pearson Correlation	1	-0.077**	0.057*
	Sig. (2-tailed)		.008	.050
	N	1195	1195	1195
ID uniqueness	Pearson Correlation		1	
	Sig. (2-tailed)	.008		.000
	N	1195	1195	1195
ID Activeness	Pearson Correlation			1
	Sig. (2-tailed)	.050	.000	
	N	1195	1195	1195

\*\* Correlation is significant at the 0.01 level (2-tailed).

\* Correlation is significant at the 0.05 level (2-tailed).

*Table 5. Correlation between Post Duration and user ID uniqueness as well as the correlation between Post Duration and user ID activeness*

*Correlations*

		Post Date	ID Activeness	ID Uniqueness
Post Date	Pearson Correlation	1	0.347**	0.097**
	Sig. (2-tailed)		.000	.001
	N	1195	1195	1195
ID Activeness	Pearson Correlation		1	
	Sig. (2-tailed)	.000		.000
	N	1195	1195	1195
ID uniqueness	Pearson Correlation			1
	Sig. (2-tailed)	.001	.000	
	N	1195	1195	1195

\*\* Correlation is significant at the 0.01 level (2-tailed).

*Table 6. Correlation between user ID activeness, user ID uniqueness, and Post Date*

*Correlations*

			Duration	Sensitive Terms
Spearman's rho	Duration	Correlation Coefficient	1.000	-0.061*
		Sig. (2-tailed)	.	.036
		N	1195	1195
	Sensitive Term	Correlation Coefficient		1.000
		Sig. (2-tailed)	.036	.
		N	1195	1195

\* Correlation is significant at the 0.05 level (2-tailed).

*Table 7. Correlation between sensitive terms and Duration*

*Correlations*

			Duration	Post Date
Spearman's rho	Duration	Correlation Coefficient	1.000	.401**
		Sig. (2-tailed)	.	.000
		N	1195	1195
	Post Date	Correlation Coefficient		1.000
		Sig. (2-tailed)	.000	.
		N	1195	1195

\*\* Correlation is significant at the 0.01 level (2-tailed).

*Table 8. Correlation between Post Date and Duration*