

School Bullying in Twitter and Weibo: a Comparative Study

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Abstract

School-based bullying is a serious health issue among adolescents world wide. We identify several differences in microblogs of school-based bullying between Twitter (mostly representing the USA) and Weibo (mostly representing China). First, we see a smaller fraction of victim authors in Weibo than in Twitter. We hypothesize that this may be due to Asian culture's emphasis on saving face where it is more of a taboo to be a victim or label someone a victim. Second, we see different temporal dynamics of school bullying posts due to differences in holidays and length of school days. Finally, bullying posts from Weibo contain more mentions of family than those from Twitter. This may be due to the greater emphasis on family in Asian cultures.

Introduction

Bullying at school is a worldwide health issue among adolescents. The social science study of bullying in western society has a long history (Olweus 1993). During the last decade, several East Asian countries and regions started paying close attention to this problem as well. Researchers have reported bully and victim prevalence rates and forms in Asian countries that are similar to those in western society (Kanetsuna, Smith, and Morita 2006; Schwartz, Chang, and Farver 2001; Wei, Jonson-Reid, and Tsao 2007).

Yet similar prevalence rates do not necessarily mean similar dynamics among bullying participants. East Asian cultures are more prone to emphasize the development of interdependence and the relational self, during which an individual is expected to keep group harmony and align one's own behaviors with others' in the same context, whereas individuals in western countries are more prone to develop a sense of independence and the separate self (Kağıtçıbaşı 2007; Lam and Zane 2004). These cultural differences have implications for the different behaviors of participants in bullying episodes. However, to the best of our knowledge, the study on such differences is largely unexplored.

The widespread usage of social media makes it convenient to collect data from different countries. This facilitates many cultural comparative studies, such as user behaviors (Yang et al. 2011) and emoticon usages (Park et al.

2013). We propose to use social media as an excellent data source for a cultural comparative study on bullying.

Our previous study (Xu et al. 2012) found that participants of a bullying episode often post social media text about their experiences. These posts constitute a large-scale, near real-time report of bullying episodes from that user group. Since bullying posts account for only a tiny fraction of all microblogs and the varied nature of bullying posts, it posed challenges to build a good text classifier and find enough bullying posts. For this reason, we restricted ourselves to the posts containing bullying related keywords (see next section). This may introduce some unknown sampling bias to the data and all our conclusions in the paper are subject to this bias, since not all bullying posts contain our keywords.

In this paper, we collect a bilingual microblogs corpus on school bullying¹, including English posts (tweets) from Twitter.com and Chinese posts (weibos) from Weibo.com, to study the differences on school bullying behaviors between western society and China. We investigate the corpus to examine cultural differences in authors role, teasing, temporal dynamics and social process. We also hypothesize possible explanations for these differences.

Data Collection

We collected English tweets using the public Twitter Streaming API by tracking bullying related keywords: "bully," "bullied," and "bullying" (Xu et al. 2012). As our focus is on school bullying posts, we only kept the tweets which further contain at least one of the school-related words: "college," "university," "school," and "class." The filtering is case-insensitive and we included the plural forms of these keywords. We removed retweets by filtering tweets with the token "RT."

We collected Chinese weibos through the keyword search function provided by Weibo.com. Since there is no single term in Chinese that exactly corresponds to the English word bullying, we considered all seven near synonyms suggested in (Smith et al. 2002): 凌辱, 欺负, 欺凌, 欺辱, 欺侮, 欺压, 侮辱. We chose three corresponding school keywords: 学, 校, 班. We required at least one match from each keyword list, with

¹Our corpus is not aligned, meaning that one language is not the translation of the other. The data is available at <http://research.cs.wisc.edu/bullying>.

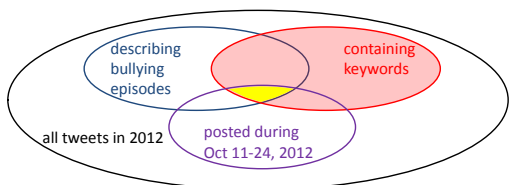


Figure 1: Venn diagram of bullying tweets. The temporal analysis is based on the red and yellow set. All other analyses are based on the yellow set only.

Author's Role	Tweet		Weibo		p -value
Accuser	67	6.0%	11	1.4%	6.5×10^{-7}
Assistant	1	0.1%	1	0.1%	6.3×10^{-1}
Bully	72	6.4%	133	16.4%	3.6×10^{-12}
Defender	26	2.3%	36	4.4%	1.3×10^{-2}
Reinforcer	3	0.3%	1	0.1%	8.5×10^{-1}
Reporter	429	38.3%	296	36.5%	4.6×10^{-1}
Victim	523	46.7%	333	41.1%	1.6×10^{-2}

Table 1: Number and percentage of author's role in bullying traces.

the option "original post only" to exclude posts reposting other weibos.

We collected data in this way for the whole year of 2012. In total, there are 756,449 tweets and 75,044 weibos in our dataset (the red and yellow set in Figure 1). Note that these microblog posts were initially keyword filtered. Not all of them are *bullying traces*, i.e. posts describing actual school bullying episodes (Xu et al. 2012). For example, (Tweet) "*Certain kids in my political science classes would benefit from a good old fashion playground bully.*" is not a bullying trace because it is not about a bullying episode.

To ensure the quality of our result, we conducted our analysis on an annotated subset of the corpus. We selected a study period of October 11-24, 2012, with the consideration of avoiding major vacations and holidays. 45,785 tweets and 3,123 weibos fell in this study period. To reduce the burden of annotation, for each day we randomly subsampled tweets so that it has the same size as all weibos collected on that day. Therefore, our annotators labeled 3123 tweets and 3123 weibos (purple set in Figure 1). Among them, 1121 (36%) tweets and 811 (26%) weibos were coded as bullying traces (yellow set in Figure 1). One possible explanation for the lower percentage of bullying traces in Weibo is that multiple Chinese bullying keywords have other meanings as well.

Fewer Victims in Weibo

Our previous study categorized the author of a bullying trace into several role (Xu et al. 2012). We expected the roles to be identical across the two cultures, but hypothesized that their distribution may differ. Therefore, our annotators labeled each author's role of the 1121 tweets and 811 weibos. Table 1 shows the number of posts from each role and their percentages. We conducted χ^2 -tests to test if the fraction of one category in tweets is significantly different from

Author's Role	Tweet		Weibo		p -value
Accuser	11	25%	0	0%	4.6×10^{-5}
Bully	10	23%	39	56%	1.1×10^{-3}
Defender	1	2%	0	0%	8.1×10^{-1}
Reporter	7	16%	10	14%	9.7×10^{-1}
Victim	15	34%	21	30%	4.6×10^{-1}

Table 2: Number and percentage of author's role in teasing bullying traces.

the one in weibos, and reported the p -value in the table, too. We found that the fractions of bullies and defenders in weibos almost double the ones in tweets. On the other hand, the fractions of accusers and victims in Weibo are significantly lower than the ones in tweets.

The distribution of author roles may reflect cultural differences between the two societies. Asian culture differs from western culture in that it stresses values of interdependence in which the development of relational self is emphasized and group harmony is highly valued over individual independence (Wei, Jonson-Reid, and Tsao 2007). In contrast, western society is conceptualized as a culture of independence in which the independent and separate self is strongly shaped (Kağıtçıbaşı 2007). It is possible that youth in the Asian culture, where greater emphasis is on interpersonal relationships, will perceive more social responsibilities for each other in terms of offering help in a peer victimization event. As a result, more youth may be identified as defenders in the Chinese language social media posts.

There were fewer victims identified in the Asian culture. This may be because of the prevalent notion of "saving face" – the confidence and moral values in ego's integrity that an individual must keep (Shi 2011; Yu 2003). In contrast to posts generated in tweets, Weibo victims, to save face, may be less likely to post about their own experiences and others may be less likely to post about them. Instead, more people label themselves or act as a bully in weibos.

More Teasing in Weibo

Some bullying traces are written jokingly, which indicates lower severity of a bullying episode; It may also represent positive social interaction among friends to increase relational bonds. For example, (Tweet) "*Miss them. No, don't think if I miss the school but I miss my friends. I miss the moment when I bullying them .-. Well, I miss the foods too.*"

Due to the different levels of self concerns and face concerns in the cultures, we would expect that Asians are more likely to accept teasing because they tend to think affiliation is a positive consequence of teasing with friends (Keltner et al. 2001). Among the annotated bullying traces, 44 (3.9%) tweets and 70 (8.6%) weibos were written jokingly. The fraction of teasing posts is significantly higher in Weibo than in Twitter (p -value 2.3×10^{-5}). More Weibo users talk about bullying as an interaction among friends, instead of a serious issue.

Member of different cultures may tease and perceive teasing in different ways (Campos et al. 2007). Table 2 shows the number and percentage of author's roles in teasing bullying

	In Semester	Off Semester	Off/In Ratio
Tweet	2194	1770	81%
Weibo	222	157	71%

Table 3: Average daily counts of microblogs containing school bullying keywords off/in-semester, and the ratio of these two categories.

traces. Here are some example teasing posts where the author takes the bully role (Weibo, translated) “*I used to bully a nerd boy in my class. In fact, it was wrong when I look back. I am a fool. lol lol*”, the accuser role (Tweet) “*@USER @USER report yall for cyber bullying ! lol*”, and victim role (Tweet) “*@USER lol shut the hell up. You’re always bullying me at school in the hallways!*”

More than half of teasing weibos were written by bullies, and the fraction is significantly higher than the one in Twitter. In contrast, we found more teasing tweet from accusers and victims. This result is consistent with our assumption on saving face in the Asian culture. Even in teasing, users tend to act as bullies instead of victims.

More Weibo Posts in the Evening

Understanding the temporal dynamics of school bullying is important for research and practice. The traditional social science study of bullying relies on personal surveys in schools. The number of participants and the frequency of such survey are usually low. Therefore, the study of temporal dynamics is handicapped by data scarcity. In contrast, we can collect a large number of school bullying microblogs at near real-time with very high temporal resolution.

Figure 2 (left) shows the percentage of microblogs containing school bullying keywords we collected from Twitter and Weibo in each day of 2012. Although these counts include the false positives (non bullying traces), the false positive rate is relatively stable during the study period of October 11-24, 2012. Therefore, the trend of actual bullying traces should be similar to Figure 2(left).

We first look into the peaks and valleys. Twitter has several extremely high and narrow peaks, which are usually caused by special events (Xu et al. 2012). On the other hand, Weibo has a relatively stable but slowly increasing trend. It is possible that new users kept signing up. Most narrow valleys in both platforms appear during weekends, when students have less direct interactions. The percentages are even lower during major long holidays, as highlighted in Figure 2(left).

To quantify the differences between in-semester and off-semester, we computed the average daily counts of microblogs containing school bullying keywords. Most schools in western societies are in-semester during mid-January to mid-June and September to mid-December. Most schools in China are in-semester during mid-February to end of June and September to mid-January. All other days are considered as off-semester. Table 3 shows the results. There are more posts with school bullying keywords in-semester as we expected. However, the number of such posts off-semester is far from zero. This shows that a focus on in-semester data collection as is normally done in psychology may be miss-

	Family	Friend	Humans
Tweet	0.61	0.25	1.84
Weibo	1.41	0.24	2.10

Table 4: Social process scores of bullying traces by LIWC.

ing the bigger picture, since bullying or discussion thereof are happening off-semester as well.

It is also interesting to look at the number of posts created in each hour-of-the-day. China uses a single time zone, and timestamps in Weibo are in local time. Twitter users spread cross many time-zones and location information is needed to convert the timestamps to the user’s local time. We employed a reverse geocoding database (<http://www.datasciencetoolkit.org>) and a rule-based string matching method to map tweets to their origins (at the state level; only for tweets within the United States).

Figure 2(right) shows the percentage of microblogs containing school bullying keywords created in each hour-of-the-day. For both Twitter and Weibo the percentage is low at late night and in the early morning, and high in the evening. This is the typical diurnal social media usage pattern as we expected. The difference between the two cultures is obvious if we compare two time intervals, afternoon (12:00-18:00) and evening (18:00-24:00). From afternoon to evening, the increment of Weibo is more significant. This difference may be caused by the difference of cellphone usage policies in schools between the two countries. It is also possible that China may have a longer school day than the US (Fuligni and Stevenson 1995), so Twitter users have more hours in the afternoon when they are free to generate posts.

Family Mentioned More in Weibo

Social media users are involved in different social groups, families, and friends. We want to see the strength of interactions with different groups when users talk about their bullying experiences. Linguistic Inquiry and Word Count (LIWC) (Tausczik and Pennebaker 2010) is a text analysis tool, which calculates the degree to which people use different categories of words. We applied LIWC to the annotated bullying tweets and the weibos (translated into English by Google Translate). Google Translate did a reasonable job in word choice, which is sufficient for word counting by LIWC.

Table 4 shows the scores of different categories under social process produced by LIWC. Weibo users use more words related to family, as the significance of family in Asian countries is presumed to be higher than in western countries in line with its collectivistic orientation where the group is emphasized over the individual (Triandis 1995). Chinese parents pay close attention to children’s education performance and environment. For example, (Weibo, translated) “*There is one bully in my daughter’s class. Several parents complain that he bullies other girls, graping their faces, even pushing them from stairs. My daughter also told me many times. I think naughty is children’s nature, but manners are also very important. Parents should not let their children be offensive. They should see a psychiatrist and apologize to other parents.*”

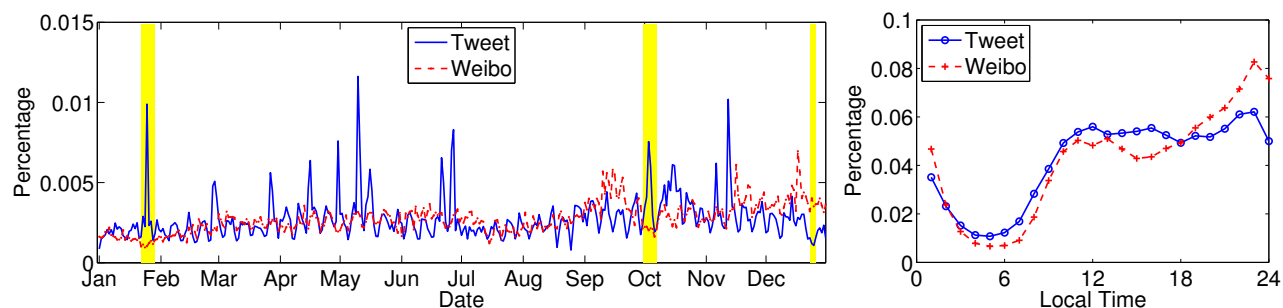


Figure 2: (left) The percentage of microblog posts containing school bullying keywords created in each day over the year of 2012. The highlight regions are (from left to right): Chinese New Year, Chinese National Day, and Christmas. (right) The percentage of microblogs containing school bullying keywords created in each hour-of-the-day.

Conclusions

In this paper, we collected and annotated a bilingual microblogs corpus on school bullying consisting of Chinese Weibo and English Twitter posts. We examined the differences in author's role, teasing, temporal dynamics and social process, and proposed possible explanations for several observed differences. There could be alternative causes for our findings as well. For instance, both Twitter and Weibo limit a post to 140 characters, but in English and Chinese, respectively. The information content of a single Weibo post is thus considerably higher than that of a tweet. Such difference may affect our annotator's confidence and hence the labels. In future work we plan to validate these and other hypotheses.

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