Herding Behavior in Social Media Networks in China

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Abstract

We conducted an interpretive, qualitative research study to investigate herding behavior around trending posts about disasters on Sina Weibo, one of the most popular social media websites in China. Our preliminary results show that in response to uncertain situations, users engage in sensemaking (Seidel, 2013) and become emotionally engaged (Taylor, 2015) as they converge around trending posts about disasters. Also, state, effect and response uncertainty (Milliken, 1987) may influence how users converge around these posts. Future research will examine the cross-cultural differences of herding behavior across Twitter (U.S.A) and Sina Weibo (China), as well as the differences across financial, scandalous, product based, and political trending posts.

Keywords

Social media, Sina Weibo, herding behavior, uncertainty, sensemaking, emotional engagement

Introduction

Ever since the emergence of Twitter in 2006, the online sharing and transmission of information via social media is gaining increasing importance for organizations. In the U.S., social media technologies like Twitter have become the voice of stakeholders with varied agendas. These technologies provide data that can be mined to understand customer sentiments about a company or its products. By using these social networks, political agendas can be pursued, and persons can share information about a disaster, a scandal, a product or other newsworthy issues. In 2009, the social media application, Sina Weibo, was launched in China. Like Twitter, Sina Weibo provides a convenient way to report events, exchange ideas, publish posts, and follow companies, influencers and thought leaders.

Users engage with certain topics on social media by commenting on the topic or sharing the post. Trends emerge on social media because of a large amount of persons speaking about the topic. An algorithm identifies topics that are the hottest emerging topics of discussion. The dynamic and open nature of social media makes us wonder, why do users converge around certain topics and what is the nature of user behavior as they do so? We also question whether user behavior with respect to trending topics on social media differs across cultures. Understanding this phenomenon is important for organizations that wish to generate and manage trending topics about their organization and products. Thus developing a theoretical understanding of this behavior is a valuable avenue of research.

To date, prior research has examined behavior on social media in terms of how it may be used by companies as a marketing tool to monitor a marketplace or increase marketing communication effectiveness (Berinato et al. 2010). Research has focused on rumors and political abuse in social media (Ratkiewicz et al. 2011). And some studies have focused on algorithm development (Yan et al. 2013). Prior research has paid little attention to users' cognitive engagement on social media. In addition, the social media literature shows that cultural differences often lead to distinct communication predispositions and Internet behaviors (Barnett et al. 2006). Thus, social media that embodies certain cultural aspects and features needs to be investigated.

One theoretical perspective that may shed light on user convergence behavior on social media is herding. Herding behavior occurs when individuals act collectively without direction or obvious influence, sometimes deserting their private beliefs (Sun 2013). For example, the un-orchestrated but similar

behavior of persons that occurs during riots, sporting and religious events, and stock market investments. It is plausible that herding behavior theory could provide a theoretical explanation as to why people comment on and repost certain topics on social media, causing these posts to become hot topics.

The specific research questions are: 1) how does herding behavior occur on social media? And 2), what are the factors influencing herding behavior on social media? We are particularly interested in the cultural influences on herding behavior. As a result we are carrying out a cross-cultural study of herding behavior in China and the U.S. by comparing user behavior on the social media sites Sina Weibo (China) and Twitter (U.S). We intend to focus on trending topics about disasters and financial, political, product based, and scandalous events. In this paper, we only report our preliminary results on herding behavior around posts about disasters on Sina Weibo.

Theoretical Background

The most popular from of herding behavior is the tendency to imitate results (Banerjee 1992). Herding behavior usually occurs when individuals alter their private beliefs to correspond more closely with the publicly expressed opinions of others (Cote et al. 1997; Asch 1956). It can also be characterized by a lack of individual decision-making or thoughtfulness, causing people to think and act in the same way. Herding behavior occurs in various social and economic situations (Duan et al. 2009) and consequently, is applicable in various contexts and levels of analysis.

At the organizational level, herding behavior has mostly been studied in the financial industry. Herding was observed in general prediction decision making where decision makers tended to follow the established pattern of decision making and made the same mistake, even if their own information suggested the correct decision to make (Bikhchandani et al. 1998). Herding also occurred in financial markets pricing (Avery et al. 1998) and digital auctions (Dholakia et al. 2002). Herding also happened during technology adoption (Sun 2013), and in some instances caused technologically inefficient innovations to diffuse (Abrahamson 1991). At the individual level, people also herd when they feel uncertain about a decision (Avery et al. 1998). In general, uncertainty refers to a person's perceived inability to predict something due to insufficient information available to them. There are three types of uncertainties: state uncertainty, effect uncertainty, and response uncertainty (Milliken 1987). State uncertainty occurs when the decision maker does not understand how the environment might be changing. Effect uncertainty, refers to a decision maker's inability to predict how environmental events will impact the decision maker. Lastly, response uncertainty refers to attempts to understand the response options that the decision maker can exercise and their value. Though not yet explored in prior research, it is possible that each of these three types of uncertainty can occur in the context of social media networks. Imitation also occurs frequently during herding behavior observed during technology adoption (Sun 2013). And it seems that by imitating and making the same decision as others, a person is willing to compromise his or her own opinions or information. For example, when deciding to post on social media networks, people may tend to pay attention to the user's identity and the number of references/repostings. The higher the number of predecessors making the same comments and repostings, the more likely one is to herd and replicate the same comments and repostings. Overall, though prior research suggests that uncertainty and imitation may have a role to play, we do not know what transpires as persons herd around posts on social media, and what practices users enact.

Research Method

Data Collection

To investigate our research questions, we conducted an interpretive, qualitative, multiple case study of 4 trending topics about disasters on the Chinese social media site, Sina Weibo. We collected the data by using an official application program interface (API) that Sina Weibo provided. We selected the first 20 comments for each of the 4 events. In all, we collected 80 comments from 80 users. We collected the data on disasters trending during November 1st 2013 to October 31st 2014 as reported in the 2014 China Internet Public Opinion Analysis Report, which ranked the top trending topics according to the highest number of total news agencies' and users' postings about the topic on social media. We extracted the data from the users' profiles, their public Sina Weibo postings, and their repostings.

Disasters Trending in Sina Weibo	Date	Description
Disappearance of Malaysian airlines MH370	March 2014	Malaysia Airlines MH370 was a scheduled international passenger flight that disappeared.
6.1 magnitude earthquake in Yunan Ludian, China	August 2014	The Ludian earthquake struck Ludian County, Yunnan, China, killing at least 617 and injuring at least 2,400.
Kunming, Yunan, China railway station attack	March 2014	A terrorist attack in the Chinese city of Kunming, Yunnan, resulted in 33 deaths and more than 140 injuries.
Kunshan, Jiangsu, explosion event	August 2014	A dust explosion that occurred in an automotive parts factory that killed 146 and injured 114.

Table 1. Trending topics on disasters from November 1st 2013 to October 31st 2014

Because some Sina Weibo users used their real names as user names, we removed any identifiers that could be used to identify users to protect users' privacy. One researcher translated the posts from Chinese to English and coded the data. A brief introduction of each event is included in Table 1.

Data Analysis

We used a grounded theory coding strategy to analyze the data by creating open, axial and selective codes (Glaser et al. 2009). We used NVIVO 11 to analyze the data in three stages. In the first stage, we analyzed the data inductively and allowed open codes to emerge. These codes included categories to suggest that subjects were using posts to give encouragement, agree with users' comments, express hope and question the reliability of the information being shared. In the second stage, we grouped the open codes into higher-level axial codes. The first axial code related to how users converged around a post to seek validation and reliable information in uncertain situations. The second axial code related to how users converged around a post to get and provide emotional support. Selective coding involved integrating the major concepts that emerged from axial coding, linking them to theory and writing the theoretical story line (Seidel, 2013). The selective codes which emerged could be linked to two theoretical concepts: sensemaking (Seidel, 2013) and emotional engagement (Taylor, 2011). The theoretical storyline suggests that users enact practices of sense making and become emotionally engaged as they herd around trending topics on social media in order to comprehend a situation. These codes are represented in Table 2.

Preliminary Results

To answer our first research question, "how does herding behavior occur in social media", the results suggest that herding behavior occurs as users engage in sensemaking (Seidel, 2013). Sensemaking involves trying to comprehend an uncertain situation by seeking answers or validation of previously posted information. Seeking validation includes questioning the reliability of the information, making new assumptions, assertions or deductions, or agreeing with former posters' comments. Sensemaking occurs readily as social media makes information about disasters visible so that it can be validated, questioned or disputed. Herding also occurs as users become emotionally engaged (Taylor, 2011) and seek and provide emotional support. Unlike the financial industry where herding behavioral studies are usually conducted, disasters are very emotional events. Social media makes emotional reactions to disasters very visible as information about lost ones, loss of livelihood and other impacts of the disaster can be readily shared. Practices of emotional engagement include giving encouragement, expressing empathy for others, expressing hope, and using emoticons and emojis to express emotions.

To answer the second research question, "what are the factors influencing herding behavior in social media networks", the results suggest that three types of uncertainty may lead to herding behavior. These include state uncertainty, effect uncertainty, and response uncertainty (Milliken, 1987). State uncertainty suggests that the poster does not understand how components of the environment might be changing, and is represented in postings where users expressed their concerns of the origins and reliability of the information. For example, in the discussion of the MH 370 disappearance, some users questioned the reliability of the information such as whether the pilot planned the disappearance of the plane. Another example occurred during the Kunshan explosion event where information produced by a well known news agency about the punishment of Kunshan's city leadership, turned out to be fake. Since the news came from a well known news agency, a discussion on the reliability of news sources ensued on social media. In these two examples, this kind of skepticism resonated with other users, which led to a significant number

of users agreeing with and/or reposting the comments of the previous users. Thus, people are more likely to herd with a predecessor who expressed skepticism or queried the accuracy of the information. Effect uncertainty relates to an individual's inability to predict what the impact of environmental events will be on them (Milliken, 1987).

Examples of Participants' Comments and Repostings	Open Code	Axial Code	Selective Code
"Even if the debris found is part of the plane, it could belong to the French plane which crashed in 2009" --- From MH 370 event	Questioning the reliability of the source of the information	Seeking validation and reliable information in uncertain situations.	Sensemaking (Seidel, 2013)
"It is very clear to me now, according to the news, that the pilot moved out of his apartment the day before the crash happened, and his personal computer has a log which shows that he practiced the flight route several times. The Malaysians were stalling by announcing that the debris was found near Australia. We wasted the best time to search for the flight in the right place" --- From MH 370 event.	Making new assumptions, assertions, or/and deductions		
"I agree with you. -- Without proper monitoring systems and legislature, events like this will keep happening" --- From Kunshan explosion event	Agreeing with former users' comments		
"Life is so precious, I hope the families will be okay in the future" --- From Yunnan earth quake event	Giving encouragement	Providing and seeking emotional support	Emotional Engagement (Taylor, 2011)
"It is just sad to look at these pictures of the earthquake. The media should not put these pictures to attract public attention. They should have some respect to the dead." --- From Yunnan earth quake event.	Feeling empathy for others		
"I really hope that MH 370 were just in some place we cannot find and they are all alive, and there is chance they can come back safely" ---From MH 370 event	Expressing hope		
🙏🙏😭😢 Emojis and emoticons such as candlelight, crying faces, and sad faces were observed in the data collection process. --- From Yunan earthquake event	Using emojis to express emotions		

Table 2. Codes for how herding behavior is represented in Sina Weibo for disasters

For example, users questioned whether it would be safe for posters to travel on Malaysian Airlines, work in Kunshan, or travel to Yunan in the future. Posts reflecting response uncertainty occurred frequently across different posts. Response uncertainty refers to attempts to understand the response options that the decision maker can exercise, and their value as they respond to trending posts. For instance, using symbols such as the asterisk in between letters of a word, or changing a Chinese word to an English word to avoid censorship, are examples of response uncertainty. Prior research shows that due to potential risks and possible undesirable results for Sina Weibo users, users are more conscious when posting and reposting comments online (Lyon, 2001). Under response uncertainty, people tend to imitate other users' comments and decisions to avoid deletion of the posts, exposure and mistakes.

Conclusion

Organizations can capitalize on herding behavior through posts on social media that generate uncertainty about its new products. For example, anecdotal evidence suggests that before a product launch, Apple generates excitement about new products by refusing to reveal information about the products' features and capabilities. Intuitively, this strategy may cause uncertainty, which leads users to congregate around social media posts to speculate and derive clues about Apple's new products, and to make sense of what

they have read on social media. Users also engage emotionally by expressing excitement (or the lack thereof) about the products. Organizations facing negative publicity may also deter herding by reducing uncertainty about the event, through their social media postings. Finally, although we have generalized our results to theoretical concepts in accordance with the principles of interpretive research (Seidel, 2013), it is possible that the results may be generalizable to other types of social media, such as Facebook and Twitter.

Future research will expand this study to examine other types of posts including, financial, political, economic, product and scandalous posts. Using multiple methods, we will also compare how herding behavior differs across cultures by comparing posts across Twitter and Sina Weibo. We will also use quantitative methods to develop and confirm hypothesis about the relationships suggested by our qualitative research results.

REFERENCES

Abrahamson, E. 1991. "Managerial Fads and Fashions: The Diffusion and Rejection of Innovations," *Academy of Management Review* (16:3), pp. 586-612.

Asch, S. E. 1956. "Studies of Independence and Conformity: I. A Minority of One Against a Unanimous Majority.," *Psychological Monographs: General and Applied* (70:9), pp. 1.

Avery, C., and Zemsky, P. 1998. "Multidimensional Uncertainty and Herd Behavior in Financial Markets," *American Economic Review*), pp. 724-748.

Banerjee, A. V. 1992. "A Simple Model of Herd Behavior," *The Quarterly Journal of Economics*, pp. 797-817.

Barnett, G. A., and Sung, E. 2006. "Culture and the Structure of the International Hyperlink Network," *Journal of Computer-Mediated Communication* (11), pp. 217–238.

Berinato, S., and Clark, J. 2010. "Six Ways to Find Value in Twitter's Noise," Harvard Business School Publishing Corporation 300 North Beacon Street, Watertown, MA 02472 USA.

Bikhchandani, Sushil, Hirshleifer, D., and Welch, I. 1998. "Learning from the Behavior of Others: Conformity, Fads, and Informational Cascades," *The Journal of Economic Perspectives* (12:3), pp. 151-170.

Cote, J. M., and Sanders, D. L. 1997. "Herding Behavior Explanations and Implications," *Behavioral Research in Accounting* (9), pp. 20-45.

Devenow, A., and Welch, I. 1996. "Rational Herding in Financial Economics," *European Economic Review* (40), pp. 603-615.

Dholakia, M., U., Basuroy, S., and Soltysinski, K. 2002. "Auction or Agent (or Both)? A Study of Moderators of the Herding Bias in Digital Auctions.," *International Journal of Research in Marketing* (19:2), pp. 115-130.

Duan, W., Gu, B., and Whinston, A. B. 2009. "Informational Cascades and Software Adoption on the Internet-An Empirical Investigation," *MIS Quarterly* (33:1), pp. 23-48.

Glaser, B. G., and Strauss, A. L. 2009. *The Discovery of Grounded Theory: Strategies for Qualitative Research*, Transaction Publishers.

Lyon, D. 2001. Surveillance Society: Monitoring everyday life, McGraw-Hill Education: UK.Milliken, F. J. 1987. "Three Types of Perceived Uncertainty About the Environment: State, Effect, and Response Uncertainty," *Academy of Management Review* (12:1), pp. 133-143.

Ratkiewicz, J., Conover, M., Meiss, M., Gonçalves, B., Flammini, A., and Menczer, F. 2011. "Detecting and Tracking Political Abuse in Social Media," ICWSM2011.

Seidel, S., Recker, J. C., and Vom Brocke, J. 2013. "Sensemaking and Sustainable Practicing: Functional Affordances of Information Systems in Green Transformations," *Management Information Systems Quarterly* (37:4), pp. 1275-1299.

Sun, H. 2013. "Herd Behavior in the Adoption and Use of Technology," *MIS Quarterly* (37:4), pp. 1013-1041.

Taylor, L. D. 2011. "Avatars and Emotional Engagement in Asynchronous Online Communication." *Cyberpsychology, Behavior, and Social Networking* (14:4), pp. 207-212.

Yan, Q., Wu, L., and Zheng, L. 2013. "Social Network Based Microblog User Behavior Analysis," Physica A: Statistical Mechanics and its Applications (392:7), pp. 1712-1723