

A Study on the Consequences of Kongping Behaviour in the Framework of the Spiral of Silence and the Weighted and Calculated Needs for New Media: Taking Weibo Kongping as an Example Postprint

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Abstract

Driven by the “artificial intelligence +” trend, numerous highly “automated” and “anthropomorphic” robotic social water armies have emerged on new media platforms to engage in kongping (a practice whereby media outlets and bloggers deploy artificial or robotic water armies to manipulate reviews, thereby steering comment content or public opinion trends to align with their own expectations). This represents an evolution from traditional artificial water armies to “fake social media accounts” and subsequently to robotic social water armies. On one hand, kongping is becoming increasingly low-cost, precise, and highly intelligent. On the other hand, large-scale robotic social water armies also exert influence on users’ media adoption and usage habits. This paper investigates the consequences of kongping based on spiral of silence theory and the weighted and calculated needs for new media. The study’s findings demonstrate that increased kongping behavior on Weibo induces greater silence among users, and that kongping behavior reduces users’ frequency of Weibo usage.

Full Text

A Study on the Consequences of Kongping Behaviour Within the Framework of the Spiral of Silence and Weighted and Calculated Needs for New Media: Taking Weibo Kongping as an Example

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Abstract: Under the influence of the “artificial intelligence +” trend, new media platforms have witnessed the emergence of large numbers of highly “automated” and “anthropomorphic” robotic social water armies that participate in kongping—a practice where mediums and bloggers deploy artificial or robotic water armies to control reviews and shape comment content or public opinion trends to meet their own expectations. This phenomenon has evolved from traditional manual water armies to “fake social media accounts” and now to robotic social water armies. On one hand, kongping is becoming increasingly low-cost, precise, and highly intelligent. On the other hand, large-scale robotic social water armies are impacting users’ media adoption and usage habits. This paper examines the consequences of kongping based on spiral of silence theory and weighted and calculated needs theory for new media. The results demonstrate that the more kongping behavior occurs on Weibo, the more silence it provokes, and that kongping behavior reduces the frequency of users’ Weibo usage.

Keywords: spiral of silence; weighted and calculated needs for new media; kongping behavior; robotic social water army

1. Introduction

In this era of rapid development in Internet technology and artificial intelligence, online water armies have undergone a transformation from traditional manual operations to low-intelligence “fake social media accounts,” and subsequently to robotic social water armies with high degrees of anthropomorphism and social attributes. Contemporary bots learn the language expressions and media habits of real users through algorithmic crawling and big data analysis, enabling them to simulate and generate language systems that match authentic user patterns. With deep learning capabilities, these social bots can penetrate public opinion spaces to an unprecedented degree. However, as communication tools, social bots are manipulated by capital or human actors to deliver purposeful messages, thereby disrupting the normal social landscape and perversely influencing public opinion. On Weibo, for instance, we have observed large numbers of robotic social water armies migrating onto the platform to participate in kongping. While this practice does serve the purpose of comment control, it has simultaneously led to a decline in active user proportions and increased user attrition. This raises important questions: What are the consequences of kongping on Weibo? Specifically, what happens when social bots participate in Weibo kongping?

2.1.1 Literature Review on Spiral of Silence Theory

German communication scholar Elisabeth Noelle-Neumann first proposed spiral of silence theory in her 1974 paper *The Spiral of Silence: A Theory of Public Opinion*. The theory emphasizes three core concepts: fear of isolation, climate of opinion, and quasi-statistical sense (Zhu, 2012). Fear of isolation leads individuals to perform quasi-statistical assessments of the opinion climate created by media, which in turn influences whether they openly express their true opinions,

ultimately reinforcing dominant opinions while silencing minority ones. Spiral of silence theory thus “reveals the tendency toward oligarchization of public opinion” (Guo, 2015).

However, scholars have also questioned spiral of silence theory. Foreign researchers such as Glynn & McLeod have noted that the variable of “fear of isolation” is difficult to quantify accurately, thereby questioning the theory’s scientific validity. Mutz points out the difficulty of accurately assessing the climate of opinion due to limitations of individual rationality, third-person effects, and cognitive dissonance. Scholars Shoemaker, Breen & Stamper have further questioned the theory’s adaptability across different cultural contexts and spatiotemporal conditions.

2.1.2 Literature Review on Double Helix Theory of Silence

With the shift from mass communication to electronic communication, scholars have proposed concepts of “anti-spiral of silence” and “double helix of silence.” In *A Preliminary Study on the Limits of Spiral of Silence Theory*, Chinese scholars Bifen Wang and Ying Wu argue that online communication’s anonymity expands expression space, weakens group pressure and fear of isolation, and creates conditions unfavorable for spiral of silence formation. In *The Anti-Silence Spiral in the Internet*, scholar Jun Yao proposes that certain “minorities” maintain firm opinions, causing audiences to reconsider and gradually transforming them into the “majority,” thereby forming an “anti-spiral of silence.”

In their article *From “Negative Silence” to “Positive Interaction”: The “Double Helix of Silence” Effect in the New Media Environment*, scholars Xianchun Gao and Wei Xie first proposed the “double helix of silence” based on changes in the new media environment and research dilemmas surrounding spiral of silence theory. Their research argues that in the new media environment, mass media disseminating information top-down and specific communities diffusing information bottom-up each form opinion spirals that interact with one another and exert decisive influence on social opinion and individual opinions and behavior. In *The Path and Channeling of Public Opinion Dissemination in Public Emergencies from the Double Helix Theory*, scholar Jie Zhang examines public opinion spread during public emergencies through the lens of double helix theory and explores channeling mechanisms.

2.2 Literature Review on Weighted and Calculated Needs for New Media

With new media development, scholar Jianhua Zhu proposed “Weighted and Calculated Needs for New Media” theory based on uses and gratifications approach, suggesting that audiences adopt and continue using new media only when they find that important needs in their lives cannot be met by traditional media and believe new media can fulfill those needs. The basic premise

of weighted and calculated needs theory is that audiences are active and their media use is purposeful.

Chinese scholars Xiaohua Wang and Lina Yan, in *A Study of Factors Determining Audience Choice of the Internet—A Re-Examination of Weighted and Calculated Needs*, employ this theory as an analytical framework to study factors influencing audience choice between Internet and newspapers through surveys. Their study finds that weighted and calculated needs for new media is not an independent variable but rather an intermediate variable influenced by individual differences. In *A Study of Internet Users' Usage Scenarios in the Era of Fragmentation—A Supplement to Weighted and Calculated Needs Theory*, scholar Shuo Chen examines the popularity of mobile Internet terminals and “fragmented” usage scenarios, showing that media use and substitution are no longer a “zero-sum game” and that new media use is no longer simple substitution.

2.3 Literature Review on Social Bot Phenomenon

Foreign scholar Boshmaf defines socialbots as intelligent programs that operate their own social accounts in online social networks, capable of automatically sending messages and connection requests, emphasizing that socialbots can achieve automatic information dissemination. According to Shuang Zhao, robotic water armies function to “replace traditional manual use of social media accounts for public opinion propaganda.”

Foreign scholars have focused their research on three aspects. First, studying robotic water armies' impact on political communication. Scholar Summer Lightfoot, examining robotic water army usage in U.S., French, and German general elections, argues through comparative studies that social bots have impacted global politics. Second, monitoring robotic water armies. Scholar Ferrara proposes three identification methods: using social network information, crowdsourcing, and artificial intelligence systems. Third, researching negative impacts of mass robotic water army infiltration on user privacy. Scholar Boshmaf Y's research shows that robotic water armies' penetration rate on Facebook reaches 80%, with the rate proportional to degree of user privacy violation.

Chinese research on robotic water armies remains relatively limited, focusing on two aspects. First, robotic water armies' impact. In *The Evolution, Problems and Governance of Robotic Water Armies*, scholar Ting Rong notes that highly “automated” robots challenge normal public opinion environments and Internet governance. In *The Development, Social Hazards and Governance of Robotic Water Army*, scholar Zhiyi Zeng identifies similar problems, arguing that government should use artificial intelligence technology to strengthen control over robotic water armies and further implement Internet real-name systems. Second, robotic water army monitoring. In *Research on Identification of Chinese Online Water Armies*, scholars Haimei Yang and Heng Wang conclude that monitoring relies mainly on analyzing content characteristics, user behavior,

and user relationship characteristics from target areas.

However, these studies do not examine large-scale robotic social water armies' impact on spiral of silence, nor do they address whether Weibo kongping behavior affects users' weighted and calculated needs for media.

2.4 Problem Formulation

Therefore, this paper analyzes robotic social water armies' participation in kongping and its impact on users' opinion expression and weighted and calculated needs for new media, based on spiral of silence theory and weighted and calculated needs theory, in conjunction with robotic social water army kongping behavior on the Weibo platform.

3.1 Profile of the Interviewees

This paper conducted in-depth interviews with nine Weibo users in April 2023, comprising six females and three males, with four holding bachelor's degrees and five pursuing master's degrees. All interviews were conducted via telephone, producing verbatim transcripts totaling 34,299 words. Interview content processing was completed by the authors. Basic interviewee profiles are shown in Table 1 .

Table 1: Basic Information of Interviewees

Interviewee	Gender	Academic Qualification	Hours of Weibo Use	Field of Study
1	Female	Undergraduate	1-4 hours	Sciences
2	Female	Master's degree in progress	0.5-1 hour	Sciences
3	Female	Master's degree in progress	1-2 hours	Sciences
4	Male	Master's degree in progress	0.5-1 hour	Business Studies
5	Female	Undergraduate	0.5-1 hour	Sciences
6	Male	Undergraduate	Under 0.5 hour	Engineering
7	Female	Undergraduate	~1 hour	Sciences
8	Female	Master's degree in progress	Under 0.5 hour	Sciences
9	Male	Master's degree in progress	Under 0.5 hour	Engineering

3.1.1 Interview Outline Development

This paper's research hypotheses are: H1: The more kongping conducted within circles on Weibo, the more resistance it provokes; H2: The more Weibo kongping conducted outside circles, the more silence it arouses; H3: The more robotic kongping is, the more silence it provokes.

Interview questions were divided into three main sections. The first section addressed basic interviewee information, including gender, age, and education. The second section translated research questions into interview questions, covering perceptions of Weibo kongping, specific media use habits, and media adop-

tion strategies. The third section prepared for potential follow-up questions that might require deeper exploration.

3.1.2 Interview Process

This study conducted semi-structured in-depth interviews averaging 22 minutes with nine frequent Weibo users. Interviews began and concluded in April 2023. Interviewees initially included the authors' classmates, with additional participants recruited through classmate referrals or Weibo platforms. Following qualitative research's principle of maximum variation sampling, by the ninth interviewee, data saturation was reached with sufficient material to answer research questions, concluding sample collection. Respondents varied in age, occupation, education level, location, and media use habits, exhibiting low homogeneity.

3.1.3 Interview Data Analysis

Each interview averaged approximately 22 minutes, ranging from 12 to 29 minutes. Buzzword frequency and high-frequency word clouds from interviews are shown in Table 2 and Figure 1 [Figure 1: see original paper].

This study analyzed interview content through open coding, an optional process where collected data is first “crumbled” and “broken up,” assigned conceptual labels, then reassembled to define concepts and discover categories. The procedure involves: (1) labeling data, extracting corresponding concepts, and defining phenomena; (2) moving concepts into deeper analysis to uncover more general categories; (3) assigning precise names to categories; and (4) discovering and summarizing the nature and dimensions of these categories.

Table 3 : Open Coding Categorization of Interview Content

Category	Original Interview Statements
Influence on Weibo use	Interviewee #1: “If there is kongping, I will doubt the authenticity of the event... I don’t really like this kind of atmosphere... I usually just read the comments. If I see kongping on every post, I will probably give up using Weibo.” Interviewee #2: “If it’s all consistent stuff, consistent comments, it’s boring, and then I probably wouldn’t want to play it again.” Interviewee #3: “I think it might have affected me after that. Because if real comments from people are completely gone, I would definitely give up.” Interviewee #5: “I will reduce my Weibo usage time because of robotic kongping behavior. Sometimes I already lost interest in reading those posts.” Interviewee #7: “Sometimes I feel tiring, I am not interesting to see kongping. There’s some questioning of the ecology of the platform. And I feels expelled when I see much kongping on Weibo.” Interviewee #8: “I would probably cut back on my use of Weibo.” Interviewee #9: “This robotic kongping behavior on Weibo causes me to reduce the probability of using it.”
Awareness of kongping behavior	Interviewee #1: “I think the person who buys this kind of online water army, he has a problem with this strategy.” Interviewee #3: “I don’t understand why they are like this. I don’t think they (the bot online water army) should exist, very much not, why should they exist?” Interviewee #8: “And I can understand why they did it, but I don’t think it makes sense, and then it doesn’t give people a very good perception of this.” Interviewee #9: “I think this kind of stuff is one of the egregious situations.”
Artificial kongping impact	Interviewee #1: “I can accept robotic kongping. But frequent human kongping would make me probably choose to give up using Weibo.” Interviewee #2: “If they control me within the Super topic and don’t let me send anything, I probably won’t want to send my thought.” Interviewee #3: “What I don’t like is the kongping in official news, or a more controversial event. I think this kind of thing makes me not able to see the real point of view.” Interviewee #4: “I will close the comment section when I see there is artificial kongping.” Interviewee #8: “I think to a certain extent it provokes rebellion in others.” Interviewee #9: “I will give up send my opinion and use the Super topic if there is kongping behaviour within the hashtags.”

Category	Original Interview Statements
Influence of robotic water army kongping	Interviewee #1: "I think it's actually a program, I don't think it has much of an impact on me... I would ignore it." Interviewee #2: "I should be more reluctant to publish when there are bots kongping in the comments section." Interviewee #3: "I don't think the impact is as great as artificial ones, and if it was a social bot online water army I would definitely voice my true opinion." Interviewee #4: "I feel that this is no better than closing comment sections. I feel very speechless. This will also cause disgust and rebellion after reading it." Interviewee #7: "The robotic water army has been involved in kongping within entertainment activities or commercial activities, and this behaviour is acceptable."
Silence on comment sections	Interviewee #2: "I should be more reluctant to publish when there are bots kongping in the comments section." Interviewee #3: "I only express my opinion when it agrees with the majority, otherwise I will hide my true opinion and choose to be silent." Interviewee #4: "I'm definitely inclined to be silent since someone have kongping behavior." Interviewee #5: "When the robot dose kongping, I choose to remain silent and just ignore it." Interviewee #6: "I would take offense when I see a online water army or artificially go for malicious comments, but I wouldn't take any specific measures." Interviewee #7: "Didn't want to publish it. It just felt like there was natural antipathy." Interviewee #8: "I would choose to be silent, because I find it troublesome."

4. Research Findings and Discussion

4.1 Human-Conducted Kongping Has Greater Impact on Users' Opinion Expression Than Robot-Conducted Kongping

During interviews, respondents generally indicated that human-conducted kongping more strongly influenced their opinion expression behavior. Most interviewees held this view because they believed expressing inconsistent views on Weibo could easily lead to arguments and even risk online violence. For example, Interviewee #1 stated: "If I didn't have a very strong will to hold this opinion, I would probably go along with the public because I am more afraid of suffering from cyber violence." Interviewee #3 similarly noted: "...but I would definitely voice my true opinion if I met a social bot."

4.2 The More Frequent the Kongping, the More It Provokes Silence

Interview respondents generally reported greater inclination toward silence when kongping behavior occurred, whether inside or outside Super topics. Interviewees explained their silence partly as avoidance of arguments, but also because opinion expression seemed meaningless under such circumstances. Interviewee #2 stated: “Because it’s a bot, and then I just don’t see the point of differentiating anything anymore. Even if you express your opinion, you’re still overwhelmed by these bots’ opinions, those tens of thousands of big data, the same comments they post, and I think then I don’t have to say that anymore either.” Interviewee #4 said: “Since someone have kongping behavior, I definitely tend to be silenced... I can definitely only post comments that he wants me to appear in, and I definitely can’t post views that oppose him.” Interviewee #4 also believed frequent kongping would provoke rebelliousness, but even under such effects, they would not post comments in revolt because it was meaningless. This study’s H1—that more comments provoke more resistance within circles—was not confirmed. However, H2—that more comments provoke more silence outside circles—and H3—that more bot comments provoke more silence—were both supported.

4.3 Weibo Kongping Behavior Influences Users’ Usage Habits and Media Choices

The majority of respondents reported that frequent kongping reduced their time spent on Weibo. Interviewee #7 felt “banished” by Weibo kongping practices, while Interviewee #8 stated: “It’s just annoying, and I’ll probably use Xiaohongshu more because I think there are more comments from real people.” However, respondents generally indicated that current Weibo kongping would not cause them to abandon Weibo entirely for new media, as Weibo still contained content of interest and remained a key channel for latest news. But Interviewee #3 also noted: “If the real comments were completely gone and it all became this (kongping), I would definitely give up using Weibo.”

5. Summary and Reflection

Through in-depth interviews with nine Weibo users, this paper clarifies group perceptions of Weibo kongping and its impact on users’ opinion expression and media use.

Regarding Weibo kongping, when users’ opinions differ from kongping positions, they are more likely to provoke silence rather than resistance, further reinforcing spiral of silence effects in public opinion. Additionally, Weibo kongping affects user experience, causing users to reduce Weibo usage frequency to varying degrees, though users do not completely abandon Weibo while seeking and using new media. Regarding human-conducted kongping, users with minority views tend toward silence to avoid arguments and online violence. Regarding robotic kongping, users lose desire to speak and choose silence when they per-

ceive communication as ineffective. This situation, on one hand, destroys the normal ecology of the public opinion arena, causing gradual decreases in real and effective communication and reducing public desire to participate in public and political life. On the other hand, during emergencies, Weibo serves as an important means of guiding public opinion, and study interviewees expressed that supporting kongping for national affairs is understandable and appropriate.

Respondents also noted that when unable to determine whether robots were involved in comment sections, they might be persuaded by commenters' opinions and accept public opinion guidance. Therefore, future Weibo platforms could optimize artificial intelligence technology for social bot kongping to make bot kongping more "seamless." Simultaneously, ensuring appropriate "degrees" of kongping is crucial to avoid overly frequent kongping behavior disrupting public opinion arena order or causing user loss.

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Note: Figure translations are in progress. See original paper for figures.

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