

The Susceptibility of Young Chinese Users of Information Cocoon on the Xiaohongshu Platform

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Abstract. The Xiaohongshu platform is a recently developed powerful online media platform in China. Its primary method of using algorithms to push information encourages the formation of the information cocoon. Based on the similar researches of selective exposure and echo chamber, this study has developed the exposure and acceptance mechanism of information. Using the platform's young Chinese users as a representative, this research aimed to test the users' susceptibility using the new information cocoon susceptibility scale. The scale was divided into six dimensions including information content, information channel, information attitude stability, information intervention, social network, and algorithmic literacy. By recovering and analyzing the questionnaires, this study found that the Chinese young users' susceptibility to the Xiaohongshu platform is generally significant. Specific manifestations may include exposure to information content homogenized, lack of diversity of information channels, tending to be influenced by information and long-term communication with a fixed group, and low personal algorithmic literacy. The outcome probably indicates that the Xiaohongshu users are less resistant to the information cocoon and are deeply affected by it.

1 Introduction

Xiaohongshu is one of the most influential social media in China. It currently boasts 300 million monthly users, with a 3:7 male-to-female ratio, 50% proportion of users are post 95, 35% proportion of users post 00, and 50% proportion of users in first and second-tier cities. More than 80 million community members shared material, with an average daily user search penetration of 60% and UGC accounting for 90% [1]. Its enormous number of young users and big volume of material, which are gathering an information environment, make it an ideal platform for evaluating the influence of information cocoons on China's youth media experience.

Wechsler's Dictionary defines susceptibility as "the state of lacking the ability to resist an exogenous factor," such as the impact of a medium [2]. Susceptibility is frequently utilized in medicine, especially in the field of infectious illnesses. The idea is neutral in a study on

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micromedia impacts. High susceptibility indicates that people are more vulnerable to media impact, whether that effect is positive or negative.

According to the China Population Census Yearbook 2020 compiled by the National Bureau of Statistics of China, Chinese youth refer to the Chinese population aged 15-35. This group exhibits the following main characteristics: first, the proportion of young people in the total population structure is decreasing. Second, the number of registered marriages per year tends to decrease among the youth population. Thirdly, educational opportunities for the young population have increased and competition has become more intense [3]. At the same time, Chinese youths have a strong reliance on social media, and the convenience of smartphones and other forms of media contact has contributed to the development of social dependence among young people, with access to information, entertainment, and recreation, as well as the maintenance and expansion of interpersonal relationships, being the most important media needs for young people to use [4].

In many fields, including computer science and information science, research on the regulation of the "information cocoon" has gained traction. Computer science investigates "algorithmic optimization" to prevent the emergence of homogenized content, while information science studies the traits and patterns of human information behavior to prevent the cocoon state. Research in the social sciences, particularly journalism, and communication, focuses primarily on critiquing the potential harm to the public interest resulting from the traditional "gatekeepers" giving up their rights, as well as systemic and policy solutions to the current state of affairs [5]. It will be helpful and delightful to learn the information cocoon and offer advice for solving the contradiction between users and platforms by investigating users deeply. This paper tries to examine the interactions and relations between information cocoon and user attributes, contributing to the following research on the information cocoon.

2 Literature review

The concept of information cocoon was constructed by Sunstein in 2006. In his book *Information Utopia*, he defined the information cocoon as a special kind of information environment, where audiences could only be exposed to the information they are interested in. Sunstein has also pointed out the negative function of the information cocoon, which has brought a serious obstacle to the progress of democracy and undermined the public of diverse viewpoints [6]. Sunstein also found the related concept of the information cocoon, which was defined as the phenomenon of the echo chamber where people communicate with others who share the same views. It contributes to the promotion of homogenized discourse, which conceived arrogance and extremism [7].

Information cocoon is not a common concept in academic papers. Researchers prefer to use the theory of selective exposure to describe this special phenomenon of information contact. The research on Selective exposure originated in the 1940s and has developed abundant achievements. There has formed a consensus on selective exposure that people tend to approach the agreed information and evade the disagreeable information actively [8]. Research concerned with selective exposure focused on political and healthy communication. Take political information for example. In the process of public political participation, political campaigns stimulate and reinforce people's inherent preferences and tendencies. People are more likely to accept messages that are consistent with their political beliefs, while information that challenges their perceptions can easily be marginalized [9,10]. People's selective exposure to political information may be influenced by multiple-dimensional factors. The first is pre-existing political attitudes, which may outweigh the credibility of the information source and the social identity of the individual. Furthermore, people prefer views and articles that match their own opinions, and the stronger and more important the opinions, the higher the probability of exposure [11]. Secondly, the political reputation of the source is

highly concerned. People are usually reluctant to engage with less reputable news media, and the negative reputational impact can be counteracted by increasing the relevance of the subject [12]. Basic theoretical models of information behavior have revealed that humans tend to be selective about information acceptance. Wilson developed the theoretical model concerning the stressful information requirement that could not trigger the searching behavior [13]. Makri and Buckley have further pointed out that people are not used to checking encountered messages. Even if the audience checks the messages, they will prevent the unexpected information from disturbing their beliefs and emotions [14].

In contrast to the less established information cocoon concept, the echo chamber theory has undergone a more thorough examination and has been supported by a substantial amount of research. Numerous academic investigations have demonstrated the presence of solitary and divisive communities, referred to as political echo chambers, on social media platforms like Facebook and Twitter. Users of social media are more likely to like, retweet, and comment on posts from others who share their political views, concentrate on a single sort of political message, and become trapped in an echo chamber if they are highly divided [15]. Echo chambers inhibit communication and empathy and diminish the plurality of viewpoints in several dimensions, political discussions, rumor spreading, academic communication, gender dichotomy, and so on [16]. In summary, echo chambers have the function of limiting the cognitive scope of the audience, creating cognitive bias, fuelling group antagonisms, and undermining social harmony and the authenticity of information [17]. However, some scholars believe that the echo chamber effect fails to explain the Internet's communication patterns. Choi and Park found that the online communities on Twitter are not echo chambers but a new type of collectivist online organization. Members of a community form a collective identity through the construction of a discourse system, and "forwarding" and "cultural blockades" are strategies for consolidating unity, expanding support, and promoting participation in the community. Most members of communities have no intense political stance and network communities contribute to presenting fresh viewpoints to audiences [18]. Dubois and Blank contended that studies focusing on specific platforms do not provide a comprehensive view of how users truly obtain information and that assessing if an individual is in an echo chamber requires considering their interactions with the media environment as a whole.

Upon reviewing the pertinent literature, it is obvious that the two subfields of echo chambers and selective contact each have a distinct study background. But generally, the research field has several issues. The nature of the phenomena of the narrowed information world is not fully understood due to the paucity of studies on the information cocoon. Studies on selective exposure that have already been conducted have concentrated on people's propensity to accept or reject attitudinally consistent messages; when measuring attitudes, the primary factor taken into account is whether or not the person agrees with the opinions presented in the messages. However, there are three factors that make up an individual's attitude: cognitive, emotional, and behavioral intention. Information can sometimes be appealing to people for its emotional regulation. However, prior research has mostly neglected the emotional component of attitude.

Previous studies on information cocooning have concentrated on three methods for designing research methodology: user questionnaire surveys, text content analysis, and social network analysis. Social network analysis uses survey or interview techniques to examine user relationships on social media. Using word frequency statistics, text content analysis examines the degree of plurality of information a user receives. User surveys are utilized to assess people's usage experiences in order to identify the micro-level causes of the information cocoon. Many researchers have turned to questionnaires as an objective and efficient way to investigate the different dimensions of information cocoon. For example, Florian Justwan and Bert Baumgaertner directly asked respondents how frequently they used

social media to access political information and how often they agreed with political information posted by their friends [19]. Using a frequency metric, Elizabeth Dubois, and Sara Minaecian, et al. assessed users' exposure to varied material by asking them how frequently they read the news that contradicted their opinions, how often they verified the information, and whether this has affected their opinions or not [20]. Other researchers operationalize the idea of an information cocoon based on the willingness of the respondent to read information that is pushed to them, whether they are willing to read uninteresting information, or how much they identify with it [21]. This allows researchers to determine whether a user is stuck in an information cocoon or not. Some scholars have also measured the respondent's ability to escape from the information cocoon instead, so as to determine the extent to which the user is affected by the information cocoon [22].

Examining the objective thickness of the information cocoon using a questionnaire method does not leverage the advantages of the questionnaire approach over big data methods such as social network and content analysis, but rather capitalises on its drawbacks. First, respondents' subjective emotions will never cease to influence their responses. Respondents have limited memories, and the measurement of information cocoon distress can easily lead to social expectation bias and avoidance or inaccurate answers. Secondly, the questionnaire is based on individual feelings and disregards taking the specifics of the topic and context into account. Therefore, Yali Cheng and Yuja Huang believe that the information cocoon is an objective environment, and most of the current questionnaire research focuses on judging the thickness of the information cocoon. However, it is more appropriate for measuring the susceptibility of the respondents to the information cocoon. Therefore, Yali Cheng and Yuja Huang believe that the information cocoon is an objective environment, and most of the current questionnaire research focuses on judging the thickness of the information cocoon but measuring the susceptibility of the respondents to the information cocoon is a better method. Unlike the description of thickness, susceptibility focuses on individual characteristics, such as the user's attitude towards the algorithm, preference for how they receive information, willingness to process it, and capacity to identify the algorithm's function. These characteristics can be well measured with a questionnaire [23].

In addition, this research has narrowed the concept of measurement to "algorithmic information cocoon" to take into account the differences in how individuals get stuck in the information cocoon under different media usage scenarios. Obviously, traditional news clients based on editorial recommendations, WeChat's public number platform based on self-subscription, and today's headline clients based on interest recommendations contribute differently to the cocoon effect. In questionnaire design, identifying the specific media environment or media technology can prompt the audience to recall the corresponding experience and provide more accurate results.

3 Methodology

This study mainly used a quantitative research method based on questionnaires. The questionnaires used in the research were improved on the basis of the scale designed by scholars Yali Cheng and Yuja Huang, and the formal measurement questionnaire had about 50 questions, which were designed to measure demographic variables, the scope of personal traveling, religious beliefs, social interactions, and media usage, in addition to the measurement of information cocooning. Information cocoon susceptibility was measured on a five-point Likert scale, with scores ranging from 5-1 for "strongly disagree" to "strongly agree" (reverse scoring for reverse questions), and the lower the sum of the total scores, the higher the degree of information cocoon. The questions are designed to focus on six dimensions in the formation of an information cocoon, including information content,

information channel, information attitude stability, information intervention, social network, and algorithmic literacy [23].

4 Results

On the basis of the identity verification of the users of the questionnaire Xiaohongshu, 550 questionnaires were sent out and 511 questionnaires have been recovered, with a recovery rate of 92.9%, which is more than 70%, so the statistical results can be used as the evidence for this study.

The research analyzed and processed the recovered data on the SPSSAU online data analysis platform, and the overall Cronbach's alpha coefficient of the scale was 0.893, with excellent reliability meeting the requirements. The KMO value of the factor model adaptation analysis was 0.736, which passed the Bartlett sphericity test with a significance level of 0.05. Therefore, the reliability and validity passed the test criteria and the results of this study are reliable.

On the six dimensions designed in the questionnaire, the four questions in the information content dimension scored a total of 4,293 points, with an average score of 2.10 points per question per person. The two questions on the information channel dimension scored a total of 1819 points, with an average score of 1.78 per person per question. The seven questions on the information attitude stability dimension scored a total of 8263 points, with an average score of 2.31 per person per question. The ten questions on the Information Intervention dimension scored a total of 14,410 points, with an average score of 2.82 points per person per answer. The seven questions in the social network dimension scored a total of 6403 points, with an average score of 1.79 points per person per question. The ten questions on the algorithm literacy dimension totalled 8942 points, with an average score of 1.75 per person per question. The overall average score for the scale was 2.15 points.

5 Discussions

According to the computations and results of the scores, Xiaohongshu users are more susceptible to information cocooning overall, and their average score is lower than 2.5 overall, meaning that their resistance to information cocooning is weaker and that they are more impacted by it than other users of the platform. The information intervention dimension, which assesses how subjectively users manipulate their acceptance of information, is the only one with an average score higher than 2.5 among the dimensions. This suggests that Xiaohongshu platform users are less likely to actively screen information and actively create information cocoons. However, Xiaohongshu users are less able to resist the information cocoon constructed by the platform's push mechanism and are deeply affected by it. The media literacy test has an average score of just 1.75, indicating that Xiaohongshu users are not very knowledgeable about the algorithm and its information filtering and cognitive shaping process. As a result, they are unable to take defensive action. The attitudinal stability test has an average score of 2.31, indicating that Xiaohongshu users are less used to actively screening information and actively creating information cocoons. Additionally, it suggests that Xiaohongshu users could be more susceptible to having the information pushed by the algorithm modify their perceptions. The average score of 2.10 for information content suggests that the content that Xiaohongshu users are exposed to might be more homogeneous and that it might be simpler for them to selectively be exposed to information that aligns with their interests. Furthermore, the average score for Xiaohongshu platform users on the social network dimension is a mere 1.78, indicating that users of Xiaohongshu are more likely to

disseminate and receive information in fixed groups, thereby increasing their exposure to information from acquaintances and increasing their susceptibility to the echo chamber effect.

In summary, users of the Xiaohongshu platform are more susceptible to information cocoons; they have lower cognitive capacities, are less resistant to information cocoons, and are more easily swayed by the information on the platform to change their own perceptions. When Xiaohongshu users use the media to get information, they are likely to contact only the information they are interested in for an extended period of time, and the information they receive is highly homogeneous. These elements could result in a stronger information cocoon's influence, which could then cause polarised opinions, cognitive deficits, extreme attitudes, and other issues.

6 Conclusion

The information cocoon susceptibility is a new measurement method introduced in this study, which draws on a large body of literature on selective exposure, the echo chamber effect, and information cocoon. Through quantitative research using a questionnaire survey, it was able to test the extent to which young users of the Xiaohongshu platform are affected by information cocoon, and after retrieving the questionnaire, we were able to obtain substantial data supporting our findings. We discovered that young users of Xiaohongshu are deeply affected by the information cocoon and barely able to resist it.

This study adopts a new measurement perspective of susceptibility, quantitatively measuring the Chinese youth users of Xiaohongshu, examining the impact of Xiaohongshu users' information cocoon and their general ability to cope with the information cocoon, and generating specific values of measurements as evidence for the study, which provides brand new data and arguments under different perspectives for the research of the field of information cocoon. In addition, understanding the information cocoon susceptibility indicators of Xiaohongshu users will help the platform to make adjustments to itself, and provide a reference for online media management organizations to formulate policies, which will further help to alleviate the information cocoon.

This study is not without limitations. Firstly, we attempted to design the questionnaire from various perspectives, which may have contributed to the information cocoon and resulted in less precision in the measurement results of the questions from each perspective. Secondly, we were unable to directly select users within the Xiaohongshu platform; instead, we could only search for the respondents outside the platform and conduct the account test. As a result, statistics regarding the time and frequency of users applying Xiaohongshu cannot be considered accurate. The measured findings may be higher than the actual results since many users may have purposefully increased their self-evaluation when completing the questionnaire, according to conjecture and the Likert scale effect. Further research is necessary to fully understand the effects of the information cocoon on users with varying levels of susceptibility and how to mitigate users' susceptibility. This study only finished the quantitative test of users' susceptibility.

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