The Research on Chinese College Students' View on the Information Cocoons on Douyin

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Abstract. Faced with the negative social impact brought by algorithmic recommendations such as echo bubbles and information cocoons on college students, the study focuses on the perception of information cocoons among Chinese college students, exploring the attitudes and reactions of this group towards algorithmic recommendations, trying to find the reasons for their information isolation and offering possible solutions. Douyin platform was used as the subject of the study due to its wide popularity. The results of the study, which were investigated through questionnaires, suggest that most college students are aware of the Douyin algorithm recommendation and hold an optimistic attitude towards it. However, algorithm recommendations may have adverse effects, especially the information cocoon. Also, filtering bubbles and echo chamber effect are brought by the algorithmic recommendations, which can make internal members understand each other but also make different views lose the opportunity of dialogue. Therefore, some practical suggestions of this situation and directions for future research in this area have been put forward.

Keywords: Chinese College Student · Information Cocoons · Douyin

1 Introduction

With the rapid development of information technology and the popularity of electronic commerce and entertainment, the recommender system with filtering technology has been more well-recognized for meeting the demand of targeted users, particularly when recommending specific content depends on users' habits. Short videos, which accustomed to pace of life nowadays, has become one of the most favorable options. There are more than 920 million online video users, and more than 90% are the users of short videos [1]. One representative short video platform in China is Douyin, which

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younger generations prefer, combines the entertainment and algorithm recommendations remarkably.

Douyin, also known as Tik Tok worldwide, is a well-known social media platform with a main function of online short videos. As the biggest short video platform in China, Douyin has the largest number of users domestically of more than 800 million. Until August 2020, Douyin has more than 600 million daily active users [2], in September 2020, more than 200 million users are having an average daily using time of 30 min and above [3]. Douyin and its international version Tik Tok also ranked 1st on global mobile (non-game) revenue list. On iOS in China, was the non-game app that generated the most revenue globally on the App Store in 2020, growing more than 600% Y/Y to $1.2 billion on that marketplace [4]. Douyin is undoubtedly one of the most influential short video platforms in China, meanwhile, of all the Douyin users, almost 50% are aged between 20–30.

It is noticeable that college students immersed themselves into Douyin. Many are conscious that they are facing the information recommended by algorithms, while may not sure whether they are trapped into some specific content and kept away form a wider range of information. Former studies have showed the reasons why college students are addicted into Douyin [5], but understanding the attitudes of college students towards the phenomenon of "information cocoons" and how they react are also of great significance for both users and platforms. Furthermore, concerns about the quality, objectivity, inclusiveness and reliability of the content recommended by the algorithms have been discussed, some say the filter also affected social understanding and ideological diversity [6], and may even have an influence on the development of human society include people's opinion expressing [7] and privacy [8].

The objective of this study was to find out what college students think of the content recommended and attitudes towards the effect brought by algorithm would be presented. Also intended to provide some insights into developing mutual understanding by operating questionnaire survey among college students.

2   Literature Review

The algorithm recommendations and filtering technology have been widely discussed for decades, not only its positive and helpful functions that help people to find out more information, but phenomenon like the "information cocoons", "echo chamber" and "filter bubbles" that restrict people's access to a more diverse world. Especially during a time when short video platforms like Douyin gained a large amount of popularity and took up most of the spare time of college students. While this topic has been widely studied, extant research did not put much attention to college students' perceptions in daily life usage of social media. This paper will look into a bit more about how college students think of algorithm recommendations and push a little further into the social understandings between internet users.

Since this paper focuses more on college students in China, many are interested in finding out the mystery Douyin has on college students. Wang Lele mentioned that the "Douyin Craze" of college students not only shows through watching videos but like to share with their friends and shoot their own videos [9]. This is greatly affected by

the immersion brought by algorithm recommendations, and also the desire of social need and pursuit of novelty and entertainment; Li Ling and other scholars from Binzhou Medical School found that there are several factors like parenting styles, personalities and the different grades they are in together made college students addicted into Douyin by operating a questionnaire and regression analysis [5].

The content that college students tend to watch on Douyin platform are usually correlated to their personal interests and entertaining habits, but the effects that Douyin has on college students and reactions of them varies. According to Su Ye and Xu Wenjing, Douyin has an obvious emotional effect on college students. To some extent Douyin helps college students to feel more happy and improved their perceptions about beauty, but also leads to addiction and emptiness emotionally [10].

How does Douyin attracts so many students' attentions? Why would it have the corresponding information or content to capture students' eyes? One of the most significant reasons is that the content recommend by the platform are almost perfectly targeted towards the users, and then users are very likely to be trapped into this kind of "information cocoons". Wang Haidi and Yi Shaoke believe that the information cocoons have a negative impact on college students' future development, since they are immersed in similar information and usually refuse to obtain new sources actively, then lead to a lack of valuable information and narrow down the knowledge of college students [11].

College students are the major population of Douyin users, therefore the problem college students meet in a way can represent the social problem shared by a wider range of population. Fang Shishi mentioned that despite cultural differences, from the angle of algorithm, there are phenomenon include isolation, polarization, and separation among different social groups, which may accumulate through the distance between various viewpoints [12]. It is of great significance to see whether the algorithms make the society more separated, whether the public are losing faith between each other, whether it destroys people's mutual understandings. Jonathan Haidt and Tobias Rose-Stockwell believes that as social media aged, optimism has faded and the list of known or suspected harms has grown, which made networks of partisans co-create worldviews become more and more extreme; disinformation campaigns flourish; violent ideologies lure recruits [13].

Jonathan Haidt took the example of Facebook to explain how he think social media threatened the connection over the world and rewired the way people spread and consume information [14]. Ira Rubinstein pointed out that while the big data provides significant economic and social benefits [8]. Kris Shaffer indicated that human cognition, algorithmic recommendation together reinforces (and exaggerate) human bias. These factors is driving media narratives to influence public opinion and potentially affecting democracy [7].

Extant research had mainly focused on the reasons and effects that Douyin platform has on college students, while it has showed the problem that may occur during the usage of Douyin, the further perceptions of college students themselves towards the information cocoons still remain to be investigated more. Research on social distancing and social problems caused by social media are also of great amount in America like. However, there are few research which have investigated the mutual understanding and the

distance between many social groups. As a large group of internet users in China, understanding how college students view the algorithm recommendations and the differences between social groups or individuals deserve a deeper research. This paper may provide some knowledge and approaches to understand the opinion of social groups especially college students towards information cocoons on Douyin and the social effects brought by algorithm recommendations.

3   Methodology

This study was conducted using survey. By doing questionnaire, Chinese college students' views on "Information Cocoons" on Douyin was collected, which was applicable to the study of the effects of algorithm recommendations of Douyin on the college students in China.

The authors settled the questionnaire on Wenjuanxing, a platform for survey that was widely used in China. Subsequently, the questionnaire was distributed through social media (e.g., WeChat). In this way, the viewpoints of college students from different cities in China were gathered. It took 10 days to finish the questionnaire. Finally, 53 copies of questionnaires were collected, among which there were 52 valid questionnaires. The rate of validity of the questionnaires was 98.1%. The factors of rejecting invalid questionnaires included that the answers showed evident regularity and that conflicts existed between answers.

4   Results

In the age of the internet where algorithm is widely applied on most platforms, it is of great significance to study the impact of content recommendations on users. Due to the ease of access to data and the practical implications of the study, the college student population was set as the main target of the research. To ensure the diversity and authenticity of the data, college students of different grades and majors were included as interviewees. The percentages of freshmen, sophomores, juniors, seniors and postgraduates surveyed were 2%, 12%, 70%, 12% and 4% respectively. Also, in terms of gender, this study surveyed 37 male students and 15 female students about their perceptions of Douyin. Surprisingly, the results have found that almost under half of the respondents (42.31%) only used Douyin for about an hour a week. The proportion of respondents using 1–5 h per week and 5–10 h per week were both 23.8%, with 7.69% of students using 10–20 h per week and another 3.85% spending more than 20 h. There was a significant positive correlation between what students tended to watch and what they were more likely to mark, such as likes, favorites and retweets. Compared to other content, film and television and funny content were more attractive to respondents, who were more likely to watch and mark them, while clothing and games were less attractive.

Douyin's search toolbar is an important way for users to subconsciously reject algorithm-recommended content and seek new information resources. The frequency and purpose of the use of the search bar can side-by-side reflect the impact of the type of information users access and the level of willingness of users to actively step out of their information cocoons. The survey results showed that only 5.77% respondents

used the search bar with high frequency, while a majority of students (61.54%) said they used it sometimes, but very infrequently, and another 5.77% say they hardly used it at all. It is noticeable that wanting to pay more attention to the content related to exciting phenomena was the main reason for using the search bar, accounting for 74.29%. While 34.29% of college students hope to pay more attention to a specific phenomenon and use the search bar, only 8.57% of them think the recommended content of Douyin is boring and hope to find the content they are interested in through the search bar. The collected results show that the three keyword types most frequently used in respondents' retrieval are funny, news and information, and games. The search frequency for music and beauty is the same, and the search frequency of clothing and appearance level is identical, 15.38% and 5.77%, separately.

Among them, the respondents' opinions on Douyin's data algorithm are the focus of this study. In this survey, 36.54% and 38.46% of respondents believe that Douyin's recommended content overlaps with their interests by 50% and 75%, respectively. However, as many as 90.38% of respondents are aware of the impact of data algorithms on Douyin's recommended content. In addition, no one is delighted with Douyin's content recommended by data, but 38.46% of respondents are satisfied with the content recommended by data, accounting for the most significant proportion. The second most important group (34.62%) was those who had no feelings for it. Less than 10% and less than 20% of college students are very dissatisfied or relatively dissatisfied with data recommendations. Respondents' views on the homogenization of the contents recommended by the data have a similar trend to their perception of the influence of the data algorithm on the recommended contents of Douyin. As high as 92.31% of college students believe that the contents recommended by data algorithms are homogenized.

Compared with the content mentioned above, the proportion of those bored or not bored with the recommendation content they often see is not much different, 55.77% and 44.23%, respectively. When being asked how to deal with the boredom brought by the recommendation content, 44.83% of the respondents choose not to spend time on Douyin anymore, while 41.38% try searching for new contents on Douyin and 37.93% turn to other information platform. As for whether algorithm recommendations have provided them with a more convenient access to information, most of their answers are "Yes". However, at the same time, nearly 70% of the respondents agree that algorithms are a menace to their privacy.

The comments section gives people a chance to express their own opinions to the public, but it is no doubt that different people have different viewpoints of the same content. Sometimes, some people even make radical comments on the video contents. For this, 48.08% of the respondents don't understand but respect this behavior, followed by parts of them totally not understand and disagree with this behavior (23.08%) and have no feeling about this behavior (21.15%). Only a minority of the respondents understand and respect this behavior. However, there are still 76.92% of the respondents considering the recommendation contents as an approach to help people build common understanding. In the context of the commercialization of video contents on Douyin, 69.23% of the respondents agrees that algorithm recommendations meet people's need for information, which enables people to get information more efficiently and directly. However, in general, 65.38% of the respondents think that they are governed by the recommended

contents and cannot reach all the information equally, which reveals that a majority of people are trapped in the Information Cocoons.

5   Discussion

Although algorithmic recommendations can bring some convenience to users' lives and allow them to access their target information efficiently, the negative effects behind them cannot be ignored. As algorithms can accurately access the preferences of target groups, people's personal information is subsequently accessed by the platform. Therefore, users' personal privacy is not effectively protected and information security can be threatened. In addition, big data can also limit the scope of information people can access, leading to problems such as information cocoons and echo bubbles. Based on the data from the respondents, it was found that most college users actually recognize the social problems associated with algorithmic recommendations, and they also agree that there is an urgent need to come up with effective solutions to the above problems. However, the findings also show that most users subconsciously accept the drawbacks and do not show strong resistance to them. Users do not perceive the disadvantages of algorithmic recommendations to be a major impact or threat to their daily lives. In other words, the convenience and efficiency of algorithmic recommendations convinced them to continue to use Douyin as a platform for their daily entertainment, compared to the disadvantages. This kind of psychology can be used to explain the emergence of the "Douyin Crazy", where people are overly immersed in the homogenized content brought about by algorithmic recommendations, thus causing them to become obsessed with refreshing the platform's pages for more similar content and even lose track of time. This mentality of users can encourage unscrupulous elements to use personal information more recklessly to endanger the property and personal safety of users. Also, too much indulgence in short video platforms can make college students waste time and fail to focus on their studies. As for how to effectively mitigate this social problem, firstly, platforms should consciously set time limits on viewing to prevent users from becoming overly addicted, and secondly, they should build and improve protection mechanisms for user information to reduce the risk of privacy leaks. In addition, platforms should reduce the impact of information cocoons on users as much as possible and recommend more information resources in more areas and genres.

In the study, respondents were asked to articulate their own attitudes towards the comments underneath the content delivered by Douyin. The results were surprising in finding that the phenomenon of information cocoons due to big data recommendations can, on the one hand, lead to psychological identification within the group, leading to a solidification of views; on the other hand, it can also lead to conflicting views. The mechanism by which personalized recommendations work is to use algorithm to recommend relevant content to users for their preferred content. It is worth mentioning that Douyin's personalized recommendations would also find other users with similar preferences based on their likes, favorites and retweets, and update their preferred content to target users. This mechanism probably leads to a high probability that people with the same interests will see the same short video content, and thus the hypothesis that algorithm recommendations will create more channels for people to understand each

other is put forward. Further statistical tests revealed that 77.08% of users agreed with the above hypothesis, while 22.92% believed that the mechanism of algorithm recommendations had instead led to more conflicts of opinion. Firstly, it is easy to deduce the reasons why group psychological identity arises. As people with the same interests will be recommended short videos of the same content, they are more likely to show their preference for the content. In addition, after reading the comments, people's minds are easily restricted by other users' views, thus creating a herd mentality. Over time, the views of the group gradually tend to be unified, and the effect of psychological identification in the group is created. Besides, the reason that causes users to express different or even opposite views on the same content is also due to the mechanism of recommendations, more people with a strong interest in the same video are directed to the same video content, and they are more inclined to express their own ideas than those who do not have a strong preference for the video content, which contributes to different views colliding with each other in the comment section and thus may cause discord. It can therefore be concluded that algorithm recommendations can, on the one hand, provide a channel for like-minded people to communicate, giving users a sense of psychological identity within groups, and, on the other hand, stimulate the collision of different views so that ideas can be become varied and tested by the public.

One of the reasons why short video platforms have exploded in popularity is personalised recommendations, and Douyin is no exception. Algorithmic recommendations can easily lead to an information cocoon, where users are recommended more homogeneous content because their browsing preferences are captured by big data. This leads to a narrower field of information being accessed, as if trapped in a cocoon, with a weakened connection to the outside world. From the results of the study, the majority of people can feel the presence of algorithm recommendations, with 97.92% of respondents stating that they are clear that Douyin recommends content of more interest to them due to the algorithm. Also, the results of the survey show that 83.33% users believe that algorithm can trap people in an information cocoon. Respondents believe they are trapped in the same type of information at the expense of other enquiries, resulting in their perceptions becoming increasingly one-sided and narrow, isolated from the real world. But while users acknowledge the range of negative impacts of the information cocoon, their willingness to try to break through the shackles is not strong. College users are easily trapped in information cocoons but it is difficult for them to escape from this dilemma. It must be acknowledged that this is not an optimistic phenomenon and that college students' ability to explore actively is diminished by algorithmic recommendations. Their thinking patterns can become one-dimensional and one-sided. To improve this dilemma, a broader and freer information exchange platform should be established to provide students with more diverse information resources, so that they are not easily trapped in a cocoon of homogenous information and can receive different perspectives and broaden their horizons. In addition, students should be encouraged to make use of different channels to obtain information, so that the sources and types of information can be more diverse, stimulating their critical and creative thinking.

6   Conclusion

Through interviews and questionnaires, this study found that most college students are aware of the Douyin algorithm recommendation and hold an optimistic attitude towards it. However, this group also believes that algorithm recommendations may have adverse effects, such as privacy disclosure and personal information data exploited by a third party, and even eroding and damaging people's decision-making ability and knowledge acquisition. Secondly, algorithm recommendation will explicitly magnify the selective mechanism that college students actively accept Douyin. Although college students can choose their favorite content, they abandon most of the content, thus obscuring their vision of the cognitive world. Finally, most college students showed that they had the experience of obtaining the required information in Douyin through algorithm recommendation and realized that users are scattered and involved in different circles. So the content and quality of information acquisition in circles have also changed structurally. In other words, these circles have filtering bubbles and echo chamber effect, which can make internal members understand each other and finally unify the members' positions in the process gradually. However, it will solidify progressively and stereotype in the long run and lead to the thickening of the "inner wall" of the circle. It will also make different views lose the opportunity of dialogue and exchange and seek common ground while reserving differences, resulting in the intensification of disorder in public social space. Therefore, given the negative impact of the above algorithm, the relevant departments need to formulate effective laws and regulations to refine the responsibility attribution of the algorithm and make it develop in the direction of safety, transparency, serving the society, and in line with the interests of the public. In addition, the current algorithm can not get rid of its technical defects, but its development speed is faster and faster. Therefore, it is urgent to build a relatively flexible algorithm model that can be effectively spread, used, and comprehensively integrated. It is worth noting that this study plays an academic role in promoting and discriminating the Chinese college students' view of algorithm recommendation and the relationship between individuals and social groups. However, future research can conduct an in-depth non-linear investigation on whether college students' satisfaction will decline due to the exposure to algorithm defects. Moreover, explore whether college students with different attributes can establish a common understanding when using the Douyin platform with algorithm recommendation function using model research and variable analysis methods.

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