


Filter Bubbles? Also Protector Bubbles! Folk Theories of Zhihu Algorithms Among Chinese Gay Men

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Abstract

In light of the awareness that we know little about how algorithms are perceived by groups other than those in the mainstream, this study investigates how Chinese gay men on Zhihu generate folk theories of the operation and impact of the platform algorithms. After recruiting 16 long-term users on Zhihu as informants and conducting thematic analysis, two overarching themes are identified: (1) the algorithm as evictor, supported by the users' folk theories of sidelining, disorganizing, and defaming; and (2) the algorithm as protector, supported by the users' folk theories of shielding, recognizing, and exclusive networks. Based on the empirical data collected, this study provides inspiration for understanding algorithmic complexity, and challenges the mainstream appeal to break through filter bubbles (information cocoons) by indicating its (hetero)normativity.

Keywords

algorithmic folk theory, algorithmic marginalization, hiding in plain sight, algorithmic complexity, filter bubbles

Introduction

With algorithms increasingly being used to stimulate and govern human behaviors (Danaher et al., 2017), investigating people's awareness and perception of algorithms has become "an issue of agency, public life, and democracy" (Gran et al., 2021, p. 1779). Understanding the embeddedness of algorithms in people's everyday lives may also help us avoid the discourse of algorithmic myths (Introna, 2016) and empower users to resist algorithmic governance (Cotter, 2021). Scholarship has explored many aspects of people's algorithmic awareness and perception, for example, algorithms for feeds on social media (DeVito et al., 2017; Eslami et al., 2015), decisions made by algorithms (Lee, 2018), and platform algorithms that assist people in their work (Christin, 2017; Christin & Lewis, 2021; Cotter, 2019). However, as Hargittai et al. (2020) remind us, we know little about how algorithms have been perceived by groups other than those in the mainstream.

As such, this article attempts to contribute to filling the aforementioned gap by investigating the perceptions of Chinese gay men of the algorithms on Zhihu, a question-answering platform. When we first access Zhihu, it requests that we sign up for an account, then, as registered users, we will have permission to create content (questions, answers, articles, notes, etc.) in multiple modes (text, images, videos,

etc.) and interact with other registered users (by clicking the like, forward, collect or comment buttons or by directly sending private messages) on Zhihu. On our frontpage, all the content is recommended by algorithms based on our online trails, and we can also access more content through trending lists or the search bar.

Although Zhihu is a public platform accessible to all in China, it has been appropriated by gay men for exploring various affordances to enable their queering of media practice (Zhao & Chu, 2022). However, as the algorithmic systems of Chinese social media are not immune from governmental supervision (Chen et al., 2021; Meng, 2021), coupled with a negative official attitude toward homosexuality, Zhihu algorithms, as parts of "sexist assemblages" (Gerrard & Thornham, 2020), conduct moderation on gay content. Wang and Zhou (2022) indicate that Zhihu algorithms are prone to showing

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only financially profitable homosexual content, and deliberately restrict the visibility of deviant and authentic queerness.

As Wang (2022) suggests, algorithms do not treat all users in a uniform way. This study believes that exploring the perceptions of gay men who are influenced by algorithms in practice will (1) enrich critical algorithm studies via experience from the marginalized group concerned; (2) provide diverse perspectives for unfolding different patterns in which algorithms may operate and enable our better understanding of their complexity; and (3) enable us to review critical algorithm studies critically. In the following, I begin by introducing related studies as background and algorithmic folk theories as the theoretical framework. After thematic analysis to identify the theories that gay men who use Zhihu hold of how the platform algorithms operate, I provide inspiration for understanding algorithmic complexity, and challenge the call to break filter bubbles (information cocoons) by indicating the (hetero)normativity of this appeal.

Literature Review

Digital Practices of LGBT+ People in the Algorithmic Age

Gillespie (2017, p. 66) has recorded an interesting story that, due to US Senator Rick Santorum's radical attitude to opposing LGBT+ rights, the word "santorum" was redefined by LGBT+ people as "the frothy mixture of fecal matter and lube that is sometimes the by-product of anal sex"; and the websites of *Spreadingsantorum.com* and *Santorum.com*, which spread this new definition, have been unexpectedly recognized by the Google algorithm and remained at the top of the search results for nearly a decade. In this matter, an algorithm became LGBT+ people's "ally," as suggested by Yue and Lim (2022, p. 339), when their interviewees reported that platform algorithms can be positive in visualizing LGBT+ content. Simpson and Semaan (2021, p. 24) also resonate with the above perception, as they found that recommendation algorithms on TikTok can help LGBT+ people reach out to communities and reaffirm their sexual identity; but meanwhile, they seriously accuse the TikTok algorithms of having implementing the structural exclusion of LGBT+ people in a "bounded sociotechnical system" and even in a broad "societal structure." Karizat et al. (2021) conceptualize such algorithmic marginalization as "algorithmic representational harm," noting that TikTok algorithms have been being used to erase vulnerable people's practice traces and restrain their narratives. In addition, the "real name" rule is also suggested as a notorious form of algorithmic governance of LGBT+ people (Sender, 2018). This quest for transparency and openness has also been criticized as heteronormative and patriarchal, posing inevitable dangers for LGBT+ people (Cho, 2018; Lingel, 2021).

Faced with such complexities, LGBT+ people are more cautious and proactive when interacting with algorithms,

disclosing a different identity depending on the various media conditions (DeVito et al., 2018b) and appropriating some platforms or repurposing certain spaces as queering, such as Reddit, Tumblr, Twitter, and Zhihu (Jenzen, 2017; Song, 2022; Zhao et al., 2022). LGBT+ people also attempted to domesticate the algorithms of platforms such as TikTok, but found they were unable to achieve this due to the power of the algorithms and the value conflict between them and the platform (Simpson et al., 2022). The digital practice scripts of LGBT+ people are still inevitably governed by algorithms, from the visibility of the whole community to what kind of people they can meet on dating apps (Wang, 2020).

Algorithmic Folk Theories and the Algorithmic Imaginary

The use of a "black box" as a metaphor for algorithms has been widely acknowledged (Pasquale, 2015). The design logic and operation procedures are often difficult for average users to understand, due to the large structure of algorithms, their rapid updates, and the high level of professional knowledge required (Gillespie, 2014; McQuillan, 2016; Seaver, 2019). However, the complexity and obscurity of an algorithm does not mean that users will not develop an understanding of it; they will speculate, deduce, and even experiment with its rules in their own digital practice. Eslami et al. (2015, p. 159) conceptualize such users' exploratory perceptions of platform algorithms as "algorithmic folk theories," and DeVito et al. (2017, p. 3165) define them as "intuitive, informal theories that individuals develop to explain the outcomes, effects, or consequences of technological systems, which guide reactions to and behaviour towards said systems." Folk theories represent users' attitudes or opinions toward the algorithmically mediated results that we encounter every time we go online (DeVito et al., 2017). These theories are derived from a variety of sources and are "confirmatory combinations" achieved by users comparing and verifying fragmented information on multiple platforms (DeVito et al., 2018a, p. 8). Regardless of how correct, or incorrect, these theories are, they influence and even determine the interaction modes between the users and the algorithms.

Similarly, Bucher (2017, p. 40) introduces the concept of the "algorithmic imaginary," which she believes not only implies users' perception of algorithms, but is also "a powerful identification that needs to be understood as productive." Through these diverse algorithmic imaginaries, people consider algorithms as various "symbolic resources," interpreting and exploiting them in different but self-perceivedly valid ways (Christin, 2017, p. 10). Based on users' ever-changing algorithmic folk theories and algorithmic imaginaries, the scripts in which users interact with algorithms also vary. As the form and content of the input data are updated by users, the algorithms are also updated through machine learning to wrestle continuously with the users for

Table 1. Demographic Information of Informants.

	Age	Length of using Zhihu	Job-study status	Discipline	Rural/urban status
I0	23	6 years	Master student	Literature	Urban
I1	24	4 years	Master student	Economics	Urban
I2	21	5 years	Undergraduate student	Finance	Urban
I3	24	6 years	Master student	Geography	Urban
I4	21	6 years	Undergraduate student	Communication	Urban
I5	25	5 years	Master student	Environmental Science	Urban
I6	28	9 years	Public servant (Bachelor)	Law	Urban
I7	22	7 years	Teacher (Bachelor)	Art	Rural
I8	20	4 years	Undergraduate student	Literature	Urban
I9	23	4 years	Master student	Mechanical Engineering	Urban
I10	27	5 years	Public servant (Bachelor)	Urban and Rural Planning	Rural
I11	22	4 years	Undergraduate student	Materials Science	Urban
I12	28	7 years	Back-end engineer (Master)	Communication	Urban
I13	25	6 years	PhD student	Economics	Urban
I14	23	5 years	Master student	Bioengineering	Urban
I15	25	6 years	Master student	Communication	Urban

“social power” (Bucher, 2017, p. 42). It is perhaps fair to say that these productive user perceptions and identifications are also continuously reshaping the ways in which algorithms operate, altering the power dynamics between users and algorithms.

As such, based on the framework of algorithmic folk theory, this study asks:

Research Question: How do Chinese gay men perceive Zhihu algorithms? What algorithmic folk theories have they generated? Why do they believe them?

Method

Suggested by Hargittai et al. (2020), this study was built around one-to-one semi-structured interviews as the means of collecting data. Informants were recruited in two ways (1) by posting ads on my personal network on WeChat and (2) by posting an ad in answer to the question that has been appropriated by gay men for dating on Zhihu. The recruitment ads requested informants who were daily users of Zhihu and stated that they would be asked about their perceptions of and interactions with the platform mechanism as gay men. Following the suggestion from Hargittai et al. (2020), the word “algorithm” did not appear in the ads.

In total, 16 gay men were recruited and interviewed in January 2022 (demographic information is shown in Table 1). Their average length of Zhihu use was 5.69 years, suggesting not only their familiarity with the culture and design of the platform, but also enabling them to report and compare their perceptions of Zhihu algorithms across time. As a consequence of the sensitivity of the topic and the reminder in Gerrard’s (2021) study regarding pseudonyms (i.e., that using pseudonyms similar to the online nicknames suggested by

informants may inadvertently involve privacy exposure), this study used consecutive Arabic numerals to name the informants, from I0 to I15. Only one informant was interviewed face to face; all the others were interviewed via online voice call, with an average interview length of 39 min. Each interview began with a question about content ranking, to test whether informants were aware of the existence of Zhihu algorithms. I found that almost all the informants were able to mention the word “algorithm” on their own. From this initial starting point, I then began to ask them directly about their perceptions and evaluation of, and interactions with, the Zhihu algorithms.

To analyze the data, this study followed the coding procedure proposed by Saldaña (2013, p. 91) of conducting two-cycle coding in preparation for the thematic analysis; as this is a study of folk theory, “in vivo coding” was mainly used to represent informants’ subjectivity. In the first round, all data reported by the informants that were related to the algorithmic processing, algorithmic imaginary, emotions toward algorithms, behaviors toward algorithms, and algorithmic evaluation were selected, and, in the second, pattern coding was implemented. Finally, two main themes were identified.

Findings

In a sociopolitical context in which the digital practices and public narratives of LGBT+ people constantly face governmental scrutiny and regulation (Yang, 2019), and in the technological context that Zhihu algorithms are proven to be moderating LGBT+ content (Wang & Zhou, 2022), the informants reported a range of ideas, speculations, and beliefs about the logics, procedures and impacts of the algorithms at work in Zhihu. Although the algorithm is always complex, two overarching themes that resonated widely with the informants were identified, in their own words: the algorithm as

evictor, and the algorithm as protector. Different algorithmic folk theories are also demonstrated to detail how and why gay men who use the platform generate and maintain their attitude toward, understanding of, and perhaps also investment in, Zhihu.

Two further points also need to be previewed: (1) evictor and protector does not involve a binary understanding, and more explanations are presented in the discussion section; (2) informants' folk theories may seem poorly considered or even wrong to some professionals, but, as mentioned in the literature review, this is what folk theory is supposed to be; these seemingly contradictory and self-doubting perceptions of algorithms are shedding light on the practical impact of algorithms.

The Algorithm as Evictor

Algorithms assert that we have no traffic and give us [our expressions on the site] low weighting, so we gay men will never appear in the center! [. . .] They are evictors, yep, they have evicted us from the center to the margins. (I0)

Although others did not use the word “evict” directly, I found that this argument resonated among several other informants. Echoing the work of Karizat et al. (2021) and Simpson and Semaan (2021) (who found that TikTok algorithms marginalize LGBT-related content), informants leveled a series of theories regarding Zhihu, claiming that its algorithms actively worked to suppress their visibility on the platform and to *sideline* them, especially in discussions of marginalization and minoritization on the platform.

I3 recalled that before 2017, he often received recommendations for answers to the question “how to calmly accept the fact that my son is gay,” which attracted many responses due to its complicity and contradictoriness. But when he clicked on the homepage for this question during the interview, he was surprised to find few serious-minded responses had been posted in the past 3 years. Then he checked on other homepages of gay-related questions, and could not help but exclaim: “it is not at all as active as it was back then! There are really very few [new answers]!” I3 speculated that “maybe it is because all the [gay] topics have been discussed? Or is it that people are just not interested in continuing to discuss such topics on Zhihu?” However, he seemed dissatisfied with these explanations even as he voiced them. He concluded that this trend was following the change in the macro social environment and that the atmosphere on Zhihu had changed, leading not only netizens to be less willing to discuss gay topics, but also to algorithms being more likely to deactivate gay voices.

I would like to conceptualize I3's experience as “algorithmically driven obfuscation”: operating in an obscure and biased manner, the algorithm has been obfuscating users' perceptions not only of the algorithmic rules, but also of the social facts. In my case, due to algorithmically driven

obfuscation, gay men can only explore the reasons for reduced visibility in front of fragmented clues left by the algorithm; for others, this can also lead to misunderstandings, such as that gay men are reluctant to engage in more public expression. On Zhihu, such algorithmically driven obfuscation of knowledge about gay men appears to operate along two trajectories.

The first seeks to avoid raising the profile of (and, in some cases, directly removing) gay-related topics on the platform's various trending lists. I13 identified this tactic during his interview, arguing that this was an issue of fairness; that regardless of the topic, there should be equal opportunities to be seen. Thus, when Zhihu algorithms sideline gay-related content from the trending lists, I13 saw this as a matter of discrimination and inequality. As another informant suggested, this refusal not only limits the distribution of gay-related content, but might also play a role in solidifying stereotypes of gay men within broader Chinese society, since if such topics are not on the trending lists, “some users will never encounter gay men even if he has used Zhihu all his life” (I14).

The second trajectory that appears to be deployed by Zhihu is to restrict gay-related content from appearing on users' frontpage recommendations. Although I7 stated that the proportion of his daily searches for gay-related content was about one third, he noticed that he seldom received recommendations on such topics when he logged on. I8 echoed this observation and pointed out that although he followed some gay-related topics on the platform, it was recently the case that such content rarely appeared on his frontpage for him to browse. I13 believed that Zhihu's algorithms were tasked with labeling content that is gay to achieve this restriction, and I5 suggested that “it is easy to limit us, just to tweak a parameter.” For these users, at the heart of the algorithmically driven obfuscation was a question of parity and fairness. For them, it seemed that the “common rules” of algorithmic recommendation systems were being obfuscated on Zhihu when it comes to gay-related content. Their reading preferences, as well as their concerns, appeared to be treated differently from those of other users.

Zhihu's apparent anti-gay bias was not restricted to its recommendation algorithm, but was also seen to be operating in the search algorithm; an algorithm that is core to all such question-answer platforms. Informants suggested that such prejudice was displayed in the *disorganized* results that Zhihu returned in response to gay-related questions or keyword searches, which can also be understood as a type of algorithmically driven obfuscation. I6, for example, recalled his experience of searching for a question that had been repurposed by gay men for dating:

When I typed the keywords “how to find and how to meet a boyfriend for a boy on Zhihu,” it (the searching algorithm) did not help me to automatically associate the question with the highest number of answers but guided me to some inexplicable answers!

Being shown “inexplicable answers” does not mean that the search results are not gay-related, but that they contain unpopular and often very old content, as if to add to the difficulty of gay men (and others) accessing the desired gay content. I14 reported a similar experience, stating that it took considerable time for him to access this dating question even though he had typed accurate keywords. He found the exact link to the question by scrolling down the search results page and then clicking on an answer that seemed relevant. I8 attributed this algorithmic “disorganizing” to government policies:

Some of its search algorithms, these things, feeling that they are the same as the national policies. That is, it will avoid putting some [gay-expressed] content at the top [of the results], and the top content presents the mainstream view, which includes bias or something negative toward gay men. This is not fair!

In China, national policies and attitudes have hidden but firm associations with the operations of digital media platforms; these act as a sword of Damocles, which forces platform owners to engage in practices of self-regulation and self-censorship for fear of being unconditionally (or even permanently) blocked. Companies in China, regardless of size, take these unspoken rules very seriously. This was evidenced in the actions of ByteDance, the owner of Douyin and TikTok, which extensively overhauled its algorithms to ensure that the same kind of “positive energy” advocated by the government was prioritized on its platforms (Chen et al., 2021). This overhaul of algorithms occurred shortly after the company was criticized by the state-sponsored media (Meng, 2021).

Similarly, the most popular gay men dating app in China, Blued, proactively cooperated with the Communist Party of China when it reframed itself as a “health education platform” (Miao & Chan, 2020). This reframing included banning various erotic practices, images, and discourses from the app, and promoting HIV prevention knowledge and HIV testing channels (Cummings, 2020). It is, therefore, unsurprising to find informants questioning the role of the State in the shaping of Zhihu’s algorithms:

If there really are [prejudices], it is also due to some policy pressure and cultural pressure. The algorithm, for me, is only a, perhaps microcosm of a certain attitude toward this group (gay men) at the level of the whole country and society. (I12)

[Zhihu algorithms] follow national policies or practices to restrict some content. (I8)

In the process of execution, the algorithm will always follow its code, so I think it still, it comes to programmers and [the] policies behind them. (I15)

It is worth noting that I12 offered very positive feedback during the interview on the fairness of the algorithm itself. He attributes the algorithm’s bias against gay men to official

pressure; the algorithm is innocent. This folk theory may be relevant to his occupational background, and, as a relevant practitioner of algorithmic work, it is entirely reasonable to emphasize the legitimacy of the algorithm.

Although gay men and gay content appear to be sidelined on Zhihu, gay-themed material *does* appear on the site, although, again, this appears to be carefully curated by the algorithm. Informants pointed out that when discussions for gay men do appear, the posts and answers deemed most relevant by the platform invariably frame gay men in negative terms; that is, the informants believed that Zhihu algorithms have been *defaming* them, obfuscating their reputation in public. I8, for instance, stated that when he performed a keyword search for “gay,” the responses were overwhelmingly defamatory in tone: “I think it may be that the mainstream view of me and this group is still negative.”

Such defaming is not unique to Zhihu and I15 noted that this phenomenon regularly occurred when he searched for content on other websites, or encountered gay-themed stories in the news media. For the most part, gay-themed content was absent from such publications, but, when it did appear, the framing of such stories was for the most part negative. This echoes Jiao’s (2021) research into *China Daily*, a state-sponsored news source and form of official media in China, in which she identified the regular framing of gay men as diseased and dangerous. This was primarily achieved by continually linking gay men to the HIV/AIDS epidemic. Outside such disease-focused discourse, Jiao (2021) found that gay men were, for the most part, rendered invisible by the state media system. Conforming to mainstream views and official attitudes, the Zhihu algorithm can thus be accused of using itself to support the stereotyping of gay men by presenting defamatory commentary about them in the top search results.

Whether it be the disorganization of results generated by gay-themed keyword searches, prioritizing defamatory wording toward homosexuality in search results, or sidelining gay-themed topics, Zhihu algorithms appear to have been engineered to silence gay voices. Informants with long-term experience of using Zhihu also pointed out that this seems to be exactly what happened in the previous few years and may be linked to changes in the political context. I11 gave a very direct example of this:

Several years ago, when I searched for “gender societies in universities,” there were many items, but lately, no matter how many keywords I added, this content does not come out anymore.

As Gerrard and Thornham (2020) suggest, digital platforms are, through their algorithms, participating in a process whereby they decide which behavior is socially acceptable and which behaviors (but also identities) are suspect. Many of the informants who participated in this research were painfully aware of what Simpson and Semaan (2021, p. 24) refer to as “algorithmic exclusion,” which not

only keeps them out of the mainstream on Zhihu, but also likely serves to reproduce and further validate the stigma and homophobia prevalent in mainstream Chinese society. From this perspective, the folk theory perceived by I0 that Zhihu algorithms are acting as “evictors” seems not only well-documented, but also resonates widely.

The Algorithm as Protector

Alongside the negative framing of Zhihu and its algorithms, the interview transcripts also reveal a counter-argument to this negative experience, or, in some cases, an alternative reading and understanding of the same experience. These kinds of positive narratives about Zhihu algorithms were supported by three interconnected theories: the information barriers built by the filter bubbles are believed to *shield* gay male users from outsiders; the recommendation algorithms are also perceived to *recognize* scattered gay male users and to provide them with access to various gay communities; and thus, algorithm-driven *exclusive networks* are believed to have been established.

When people refer to algorithms as creating “information cocoons” (Sunstein, 2006) and “filter bubbles” (Pariser, 2011), it is always emphasized that information barriers hinder the interaction and flow of views and polarize people’s thinking. However, the informants in this study offer a queering interpretation of information barriers:

The information barrier of Zhihu is so well constructed and will never lie to you. It should be said that absolutely no straight man or woman will find this [gay] space; for those who have never been exposed to this [gay] topic, the possibility of entering is too low. (I3)

It can be seen that I3 used positive sentiment to refer to the information barrier, which stemmed from his belief that information barriers prevent the sudden intrusion of outsiders. In the words of I9, this meant that Zhihu algorithm shielded gay man users from succumbing to “sudden curses and attacks” from non-gay users. As suggested by I15, the algorithmically constructed barriers ensure that “the outside world and others, they will not be involved in the [gay] relevant information flow.” Unlike the discourse on diversity under an emphasis on algorithmic curation in mainstream discussion, my informants were more concerned with the discourse of security. In a social context in which gay people still suffer from official non-recognition and potential stigma, such a perception can be considered quite reasonable. As several informants complained, there are still many people on Zhihu who loathe or even hate gay people. Algorithmic curation effectively creates a wall around this community that hides users and content from others and shields gay content (and gay users) from the rest of the site. While information barriers indeed obstruct others from learning more about gay men and the queer visibility, they are equally protecting

them from heterosexual interlopers who might engage in homophobic bullying and harassment, or who might try to “doxx” or otherwise “out” users.

If the Zhihu algorithms create barriers that prevent unwanted (heterosexual) intruders from seeing gay content, for some informants, Zhihu simultaneously works to recognize and enfold gay male users into an enclave via processes of algorithmic recommendation. I8 articulated this theory when he described his perception of the recommendation process of his “personal dating advertisement”:

I think I instinctively feel that as long as I send it (my personal dating advertisement) out, then the people who see it must be those who have the access to this “dating question.” Or even if my post is recommended outwardly, it will be recommended to those who, under the algorithmic calculation, may have a need for this post; that is, gay male users.

Here, we see informants’ knowledge that the way in which Zhihu algorithms act determines their own sense of safety and shapes their own practices of self-disclosure. For some users, the algorithm could be trusted to summon them together, while screening out unwanted interest:

If someone has a negative or hostile attitude toward this (homosexuality), then the possibility that they are being recommended [with gay-related information], for me, is too low; or to say, never! In my imagination, only gay men or LGBT-friendly people can be recommended [with gay-related information], if there is a recommendation process. (I15)

I10, who lives in a rural area, expressed a specific appreciation of this mechanism and compared it to the lack of self-identifying gay men near him in real life: believing that Zhihu algorithms only permitted others who have the same (sexual) interests as he to “see” him, he credited Zhihu for getting him into a “circle of protection” that allowed him to be “visible” on the platform but only to other gay men who were similarly “visible” to the algorithms.

There is a nuance that needs to be clarified here. In the previous section, the informants’ folk theories suggested that the Zhihu algorithm has been sidelining and disorganizing gay content, which now seems to contradict their belief that the algorithm could and would recognize gay people and accurately recommend gay content to them. However, I would suggest that algorithmic personalization is at work. As Kant (2020, p. 10) suggests, algorithms determine content curation by collecting clues about users’ daily digital practices in a way that is “personally ‘relevant.’” The informants in this study have, in turn, been domesticating the Zhihu algorithms; as Simpson et al. (2022) identified on TikTok, LGBT+ people are hunting for and interacting particularly with gay content on a long-term daily basis to leave trackable clues (for algorithms). Therefore, even though the informants believed that the Zhihu algorithm has been evicting them and their content, it becomes understandable that they

simultaneously believed that they can be recognized and accurately recommended gay content by the Zhihu algorithms. As they (e.g., I7, I8, and I14) already admitted, there is gay-related content on their homepage (although it seems to have become less frequent in recent years), and it is possible to find what they want in the search bar (although it takes a bit of effort). Their perceptions also resonate with Wang (2022), who found that the algorithmic identification of LGBT+ people on Douyin/TikTok was commonly acknowledged by the audience.

For the third theory—exclusive network theory—this was, as indicated above, interconnected with the other two. The informants believed that information barriers create gay enclaves (i.e., shielding those within them from disturbance by potentially unfriendly outsiders) and that Zhihu algorithms recognize them, enabling them (especially gay newcomers to the platform) to access gay enclaves. These beliefs encouraged them in generating the theory that Zhihu algorithms helped them to create exclusive networks:

I am not sure what I am talking about, it is that for the posters, gay-related content they post will only be picked up by people who are also interested in this topic, thus generating a connection between them. And then this kind of connection is exclusive, creating a kind of protection for them. (I2)

Although such perceptions may not be completely firm, it cannot be denied that some gay male users trust the Zhihu algorithm (even if the algorithm has no intention) to create a sense of safety and secrecy for them. I7 borrowed the rhetoric of information cocoons to describe how such exclusive networks were built with the aid of algorithms:

This is the information cocoon! You browse similar information, and then it will give you a similar recommendation. Those heterosexual users are less likely to be exposed to such [gay] information, unless they search, but generally, heterosexuals will not search for these things (gay topics).

It should be noted that as I mentioned above, Zhihu algorithms have no intention to be altruistic for gay people, nothing else about Zhihu (its advertising rhetoric, its corporate statements, or framing in the public sphere) suggests that the platform is in any sense “queer friendly.” Several informants indicated they believed such protection was an *unintentional* by-product of the algorithms: “the company (Zhihu) has no intention of doing so (being pro-gay) (I1).” I8 critically pinpointed that behind the inadvertent result of making gay people believed in being protected, is Zhihu “tries its best to increase our stickiness to this product—Zhihu.” I0 also suggested that while evicting gay men to the margins and avoiding their high visibility is what Zhihu algorithms have been doing, such operations do provide a modicum of safety to especially gay man individuals; he went on to stress that such safety was a by-product of algorithmic curation, rather than its authentic aim.

The informants believed that Zhihu algorithms enable gay enclaves through the curation process, albeit as an unintentional by-product, in which they can feel safe and private, and provide them with access to these enclaves through the recommendation process. This reminds me of the concept of “hiding in plain sight,” a method of camouflage that has a long history within Chinese gay male culture. In the feudal age, engaging in the Chinese opera industry as a “优 (You)” was the main way for many gay men to hide in plain sight, since people always deemed those male actors had male partners were just for making a living (Zhang, 2008). After the founding of the People’s Republic of China in 1949, gay men began to appropriate and make use of semi-public spaces, such as public toilets, dance halls located down alleyways, and bars in high-rise buildings, so that they could meet for sexual and social reasons (Li, 2009; Wei & Fu, 2013). These spaces often served a dual purpose (such as a public toilet) or were located in unremarkable or nondescript buildings that did not draw attention from passers-by. These spaces afforded gay men the opportunity to hide in plain sight amid ever-expanding towns and cities at a time when homosexuality, while not illegal, was culturally frowned upon and subject to extra-legal sanctions (Jones, 2007). Such invisibility meant that although mainstream society knew of the existence of gay men, finding them without the guidance of insiders, was almost impossible.

Today, homosexuality still faces official non-recognition and social stigmatization in China, and hiding in plain sight is still a life skill gay males need to master to avoid prejudice and discrimination at home, at school, and in the workplace. Given these factors, and together with the long history of hiding in plain sight, it makes sense that Chinese gay men generate the folk theories that not only do the information barriers created by Zhihu algorithms shield them, affording them niches in which to hide in plain sight, but the Zhihu algorithms also recognize and guide them like insiders before, enabling them to hide in plain sight.

Discussion

Understanding Algorithmic Complexity through Folk Theories

Many scholars caution that the giant structures, rapid updates, and highly specialized knowledge required to understand algorithms help maintain the complexity and obscurity of those algorithms (Gillespie, 2014; McQuillan, 2016; Seaver, 2019). Understanding algorithmic complexity is arguably a common and long-standing theme in critical algorithm studies, and I see my research as contributing to this theme as follows.

As I stated earlier, gay men’s folk theories of the algorithm as evictor and protector do not follow a binary epistemology; rather, I argue that algorithm-driven evicting and protecting for gay men can be considered as a mutually

reinforcing holistic process. On one hand, the sidelining that reduces the weight of gay content in algorithmic recommendations and the disorganization that adds difficulty to searches for gay-related results is, in another way, protecting gay men from being exposed to unfriendly others. On the other, the information barriers created by algorithmic curation shield gay men from (unfriendly) outsiders, but, equally, also hinder the public from seeing and knowing them, achieving an algorithm-driven eviction to them.

Although there are still nuanced exceptions in this process, such as the algorithm-driven defamation believed by gay men that can be pure eviction, this still does not prevent me from arguing that the Zhihu algorithm evicts gay men while protecting them, and protects them while evicting them. As I stated above, there was no denying that Zhihu algorithms provide a modicum of safety while evicting gay men. This reminds us that algorithm-driven changes and impacts in society, culture, and technology may not be as straightforward as they appear.

Breaking Filter Bubbles: A (Hetero)Normative Appeal

As Gillespie (2014) asserts, algorithms disrupt the fairness and diversity of public knowledge and political conversation. By working as mediators to locate, sort, and present “relevant” information to individual users, algorithms have produced and situated us within carefully calibrated silos (represented by information cocoons, filter bubbles, or echo chambers). These silos sever us from each other and the broader public sphere, stifling the sharing of different perspectives—and the visibility of different people—and (re)producing the polarization of opinion. In response, more researchers have appealed for the need to break through these silos (e.g., Bozdog & Van Den Hoven, 2015), and such appeals are particularly dominant in Chinese scholarship of critical algorithm studies (e.g., Peng, 2020). Echoing the mainstream scholarship described above, this research suggests that algorithmic filtering has been discouraging access to knowledge and the expansion of discussion about LGBT+ people, thereby potentially bolstering prejudices and supporting stigmas regarding this group.

However, beyond the compliant logic to support the “correct” appeal to break through the filter bubbles, informants’ “likes” and “positive perceptions” of these algorithmic silos cannot be ignored. According to their beliefs, the information barriers that prevent information diversity and the resulting isolated spaces that only contain homogeneous people help them instead to access the gay community and provide (perceptually) “safe” enclaves that enable them to hide in plain sight. Thus, as Cho (2018) and Lingel (2021) who indicate the heteronormativity and patriarchy of emphasizing openness and transparency in developing algorithms, I would like to argue that the widely resonating principle that breaking through filter

bubbles and information cocoons is also based on (hetero)normative principles regarding access and visibility. The assumption here is that users want to see alternative content: that they want their posts to be seen by others and that they wish to be accessible and visible to all. This argument is also supported by Wang (2022, p. 294), who conducted algorithmic ethnography on Twitter to indicate the importance of filter bubbles to “enable people who fall outside of the norm to create an intimate space,” as well as the normative inclination to criticize filter bubbles.

When discussing filter bubbles, previous studies accentuated diverse information but ignored diverse *identities*, but I would like to suggest that “identities” and “contexts” matter. As DeVito et al. (2018b, p. 18) emphasize, LGBT+ users “consider not just affordances, but also their perceptions of how safe spaces are for LGBT+ identities.” In a Chinese social context that is still insecure for LGBT+ people, it is crucial to note that filter bubbles are also perceived by gay men as protector bubbles that provide safety. There *is* an ongoing and pressing need to examine and expose the dangers (both potential or actual) of algorithmic culture; at the same time, however, I also want to call attention to the ways in which some of those who might otherwise seem marginalized or oppressed by algorithms in daily life may be less interested in seeking visibility and interaction with a heterogeneous public, and more invested in living safely, both offline and online.

Conclusion

In following the scholarship on algorithmic folk theories, this study demonstrates the way in which Zhihu algorithms are believed to be evictors and protectors by Chinese gay men. This study uses this concept as a way to provide insights into deconstructing algorithmic complexity and indicating the (hetero)normativity in critical algorithm studies. Future research should, as suggested by Hargittai et al. (2020) and Kant (2020, p. 27), continue to explore the “nuances and complexities of algorithmic interventions” in terms of the diversity of identities and from their “lived experiences.” Finally, I would like to state that this study does not aim to describe a fact about algorithms, but rather a “perceived” fact about algorithms contributed by gay men; which, although perhaps de facto “inauthentic” due to the nature of folk theories, provides an “authentic” reference for understanding how gay men, who are actually affected by algorithms, view them.

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References

- Bozdog, E., & Van Den Hoven, J. (2015). Breaking the filter bubble: Democracy and design. *Ethics and Information Technology, 17*(4), 249–265. <https://doi.org/10.1007/s10676-015-9380-y>
- Bucher, T. (2017). The algorithmic imaginary: Exploring the ordinary affects of Facebook algorithms. *Information, Communication & Society, 20*(1), 30–44. <https://doi.org/10.1080/1369118x.2016.1154086>
- Chen, X., Valdovinos Kaye, D. B., & Zeng, J. (2021). #PositiveEnergy Douyin: Constructing “playful patriotism” in a Chinese short-video application. *Chinese Journal of Communication, 14*(1), 97–117. <https://doi.org/10.1080/17544750.2020.1761848>
- Cho, A. (2018). Default publicness: Queer youth of color, social media, and being outed by the machine. *New Media & Society, 20*(9), 3183–3200. <https://doi.org/10.1177/1461444817744784>
- Christin, A. (2017). Algorithms in practice: Comparing web journalism and criminal justice. *Big Data & Society, 4*(2), 1–14. <https://doi.org/10.1177/2053951717718855>
- Christin, A., & Lewis, R. (2021). The drama of metrics: Status, Spectacle, and resistance among YouTube drama creators. *Social Media + Society, 7*(1), 1–14. <https://doi.org/10.1177/2056305121999660>
- Cotter, K. (2019). Playing the visibility game: How digital influencers and algorithms negotiate influence on Instagram. *New Media & Society, 21*(4), 895–913. <https://doi.org/10.1177/1461444818815684>
- Cotter, K. (2021). “Shadowbanning is not a thing”: Black box gaslighting and the power to independently know and credibly critique algorithms. *Information, Communication & Society, 1*–18. Advance online publication. <https://doi.org/10.1080/1369118x.2021.1994624>
- Cummings, J. (2020). “Look how many gays there are here”: Digital technologies and non-heterosexual space in Haikou. *Urban Planning, 5*(4), 347–357. <https://doi.org/10.17645/up.v5i4.3484>
- Danaher, J., Hogan, M. J., Noone, C., Kennedy, R., Behan, A., De Paor, A., Felzmann, H., Haklay, M., Khoo, S-M., Morison, J., Murphy, M. H., O’Brolchain, N., Schafer, B., & Shankar, K. (2017). Algorithmic governance: Developing a research agenda through the power of collective intelligence. *Big Data & Society, 4*(2), 1–12. <https://doi.org/10.1177/2053951717726554>
- DeVito, M. A., Birnholtz, J., Hancock, J. T., French, M., & Liu, S. (2018a). How people form folk theories of social media feeds and what it means for how we study self-presentation. In *Proceedings of the 2018 CHI conference on human factors in computing systems* (pp. 1–12). <https://doi.org/10.1145/3173574.3173694>
- DeVito, M. A., Gergle, D., & Birnholtz, J. (2017). “Algorithms ruin everything” #RIPTwitter, folk theories, and resistance to algorithmic change in social media. In *Proceedings of the 20 CHI conference on human factors in computing systems—CHI’ 17* (pp. 3163–3174). <https://doi.org/10.1145/3025453.3025659>
- DeVito, M. A., Walker, A. M., & Birnholtz, J. (2018b). ‘Too gay for facebook’: Presenting LGBTQ+ identity throughout the personal social media ecosystem. *Human-computer Interaction, 2*, 441–423. <https://doi.org/10.1145/3274313>
- Eslami, M., Rickman, A., Vaccaro, K., Aleyasen, A., Vuong, A., Karahalios, K., Hamilton, K., & Sandvig, C. (2015). “I always assumed that I wasn’t really that close to [her]”: Reasoning about invisible algorithms in news feeds. In B. Begole & J. Kim (Eds.), *Proceedings of the 2015 annual conference on human factors in computing systems* (pp. 153–162). ACM Press. <https://doi.org/10.1145/2702123.2702556>
- Gerrard, Y. (2021). What’s in a (pseudo) name? Ethical conundrums for the principles of anonymisation in social media research. *Qualitative Research, 21*(5), 686–702. <https://doi.org/10.1177/1468794120922070>
- Gerrard, Y., & Thornham, H. (2020). Content moderation: Social media’s sexist assemblages. *New Media & Society, 22*(7), 1266–1286. <https://doi.org/10.1177/1461444820912540>
- Gillespie, T. (2014). The relevance of algorithms. In T. Gillespie, P. Boczkowski, & F. Kirsten (Eds.), *Media technologies: Essays on communication, materiality, and society* (pp. 167–194). The MIT Press.
- Gillespie, T. (2017). Algorithmically recognizable: Santorum’s Google problem, and Google’s Santorum problem. *Information, Communication & Society, 20*(1), 63–80. <https://doi.org/10.1080/1369118X.2016.1199721>
- Gran, A. B., Booth, P., & Bucher, T. (2021). To be or not to be algorithm aware: A question of a new digital divide? *Information, Communication & Society, 24*(12), 1779–1796. <https://doi.org/10.1080/1369118x.2020.1736124>
- Hargittai, E., Gruber, J., Djukaric, T., Fuchs, J., & Brombach, L. (2020). Black box measures? How to study people’s algorithm skills. *Information, Communication & Society, 23*(5), 764–775. <https://doi.org/10.1080/1369118X.2020.1713846>
- Introna, L. D. (2016). Algorithms, governance, and Governmentality. *Science, Technology, & Human Values, 41*(1), 17–49. <https://doi.org/10.1177/0162243915587360>
- Jenzen, O. (2017). Trans youth and social media: Moving between counterpublics and the wider web. *Gender, Place & Culture, 24*(11), 1626–1641. <http://doi.org/10.1080/0966369X.2017.1396204>
- Jiao, L. (2021). Distinguishing insiders and outsiders: Alternative representations of LGBT in the *China Daily* (1991–2019). *Communication and Society, 57*, 53–93. <http://www.cschinese.com/word/1137132021.pdf>
- Jones, R. (2007). Imagined comrades and imaginary protections: Identity, community and sexual risk among men who have sex with men in China. *Journal of Homosexuality, 53*(3), 83–115. https://doi.org/10.1300/J082v53n03_06
- Kant, T. (2020). *Making it personal: Algorithmic personalization, identity, and everyday life*. Oxford University Press.
- Karizat, N., Delmonaco, D., Eslami, M., & Andalibi, N. (2021). Algorithmic folk theories and identity: How TikTok users

- co-produce Knowledge of identity and engage in algorithmic resistance. *Proceedings of the ACM on Human-Computer Interaction*, 5, 1–44. <https://doi.org/10.1145/3476046>
- Lee, M. K. (2018). Understanding perception of algorithmic decisions: Fairness, trust, and emotion in response to algorithmic management. *Big Data & Society*, 5(1), 205395171875668. <https://doi.org/10.1177/2053951718756684>
- Li, Y. (2009). *Tongxinglian yawenhua* [Homosexuality as a Subculture]. Inner Mongolia University Press.
- Lingel, J. (2021). A queer and feminist defense of being anonymous online. In *Proceedings of the 54th Hawaii international conference on system sciences* (pp. 2534–2543). HICSS. <https://hdl.handle.net/10125/70925>
- McQuillan, D. (2016). Algorithmic paranoia and the convivial alternative. *Big Data & Society*, 3(2), 1–12. <https://doi.org/10.1177/2053951716671340>
- Meng, J. (2021). Discursive contestations of algorithms: A case study of recommendation platforms in China. *Chinese Journal of Communication*, 14(3), 313–328. <https://doi.org/10.1080/17544750.2021.1875491>
- Miao, W., & Chan, L. S. (2020). Social constructivist account of the world's largest gay social app: Case study of Blued in China. *The Information Society*, 36(4), 214–225. <https://doi.org/10.1080/01972243.2020.1762271>
- Pariser, E. (2011). *The filter bubble: What the internet is hiding from you*. Penguin Press.
- Pasquale, F. (2015). *The black box society: The secret algorithms that control money and information*. Harvard University Press.
- Peng, L. (2020). Daozhi xinxi jianfang de duochong yinsu ji pojian zhijing [Multiple Factors Resulting in Information Cocoon and the Approach of Breakthrough]. *Xinwenjie [Journalism and Mass Communication]*, 2020(1), 30–38+73. <https://doi.org/10.15897/j.cnki.cn51-1046/g2.20191230.001>
- Saldaña, J. (2013). *The coding manual for qualitative researchers*. SAGE.
- Seaver, N. (2019). Knowing algorithms. In J. Vertesi & D. Ribes (Eds.), *DigitalSTS: A field guide for science & technology studies* (pp. 412–422). Princeton University Press.
- Sender, K. (2018). The gay market is dead, long live the gay market: From identity to algorithm in predicting consumer behavior. *Advertising & Society Quarterly*, 18(4), 1. <https://doi.org/10.1353/asr.2018.0001>
- Simpson, E., Hamann, A., & Semaan, B. (2022). How to tame “your” algorithm. *Proceedings of the ACM on Human-computer Interaction*, 6, 1–27. <https://doi.org/10.1145/3492841>
- Simpson, E., & Semaan, B. (2021). For you, or for “you”? Everyday LGBTQ+ encounters with TikTok. *Proceedings of the ACM on Human-computer Interaction*, 4, 1–34. <https://doi.org/10.1145/3432951>
- Song, L. (2022). Desiring Wanghuang: Live streaming, porn consumption and acts of citizenship among gay men in digital China. *Television & New Media*, 23(5), 498–508. <https://doi.org/10.1177/15274764221080914>
- Sunstein, C. R. (2006). *Infotopia: How many minds produce knowledge*. Oxford University Press.
- Wang, S. (2020). Calculating dating goals: Data gaming and algorithmic sociality on Blued, a Chinese gay dating app. *Information, Communication & Society*, 23(2), 181–197. <https://doi.org/10.1080/1369118x.2018.1490796>
- Wang, S. (2022). Algorithmic configurations of sexuality: Theoretical foundations and methodological approaches. In W. Housley, A. Edwards, R. Beneito-Montagut, & R. Fitzgerald (Eds.), *The SAGE handbook of digital society* (pp. 281–297). SAGE.
- Wang, S., & Zhou, O. T. (2022). Being recognized in an algorithmic system: Cruel optimism in gay visibility on Douyin and Zhihu. *Sexualities*, 1–20. Advance online publication. <https://doi.org/10.1177/13634607221106912>
- Wei, W., & Fu, X. (2013). Chengshi, kongjian he tongxinglian—hongguo bentu jingyan yiji quyu chayi [Cities, Spaces and Homosexuality—ocal Experiences in China and Regional Differences]. *Qingnian Yanjiu [Youth Studies]*, 2013(1), 68–76.
- Yang, Y. (2019). Bargaining with the state: The empowerment of Chinese sexual minorities/LGBT in the social media era. *Journal of Contemporary China*, 28(118), 662–677. <https://doi.org/10.1080/10670564.2018.1557943>
- Yue, A., & Lim, R. P. (2022). Digital sexual citizenship and LGBT young people's platform Use. *International Communication Gazette*, 84(4), 331–348. <https://doi.org/10.1177/17480485221094115>
- Zhang, Z. (2008). *Aimei de lichen: Zhongguo gudai tongxinglian shi* [An Ambiguous Journey: A History of Homosexuality in Ancient China]. Zhongzhou Guji Press.
- Zhao, L., & Chu, C. (2022). Queer attention matters: A study on affordance from queer male media practices on Zhihu. *Chinese Journal of Communication*, 15(1), 34–53. <https://doi.org/10.1080/17544750.2021.2009890>
- Zhao, L., Liu, J., & Li, Z. (2022). Online dating beyond dating apps: An exploration of self-presentation of Chinese gay men dating on Zhihu. *International Journal of Communication*, 16, 2220–2238. <https://ijoc.org/index.php/ijoc/article/view/17751>

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