

Beyond algorithms: how folk theories of information homogeneity differ from academic theories across the contexts of the US and China

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ABSTRACT

While previous studies have examined online homogenous information experiences as theorized by various concepts (e.g., echo chambers and filter bubbles), we know less about how the general public makes sense of these encounters; their folk theories could be very different behind the same behaviors. Meanwhile, the contextual factors that shape the configurations of folk theories remain underexamined. This study thus leveraged a comparative approach, which contrasted folk theories with formal academic theories and compared folk theories across contexts. Combining large-scale computational frame analyses of social media posts (Weibo: $N = 245,244$; Twitter (now X): $N = 171,125$) and qualitative textual analysis, our mixed-method approach identified seven folk theories. They were compared with theories extracted based on a content analysis of relevant academic papers ($N = 132$). The cross-context comparison shows that unlike academic studies that emphasize algorithms and platforms' roles, laypeople primarily attribute information homogeneity to political actors (US) and interest-based groups (China). This study highlights folk theories' contextual contingencies and suggests a comprehensive theoretical framework that explains the configurations of folk theories in the current high-choice media environment.



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The abundance of media options and increasingly ubiquitous algorithm-driven platforms have raised scholarly concerns about the homogenous information environment (Prior, 2007). This is indicated by the wide use of pertinent concepts such as echo chambers and filter bubbles in academic discussions (e.g., Pariser, 2011; Sunstein, 2017). Previous studies mostly examined people's homogenous information consumption behaviors and their causes and outcomes (Barberá et al., 2015; Fletcher & Nielsen,

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2017; Webster & Ksiazek, 2012). However, this perspective hardly examines how people make sense of these experiences (for an exception, see Boczkowski, 2021). This is critical because similar information behaviors sometimes mean distinctive things (Toff & Nielsen, 2018). Particularly, platforms employing algorithmic curations may complicate the understanding of information homogeneity further, which is both a human-induced or technology-dictated phenomenon (Guess et al., 2018).

Given the challenge to understand information environment (DeVito, 2021; Dogruel, 2021), many laypeople have constructed their own understandings, i.e., folk theories, to guide interpretations and practices (Juarez Miro, 2023; Toff & Nielsen, 2018). This study focuses on folk theories about homogeneous information experiences. Although relevant terms (e.g., echo chamber) were first coined by scholars or writers, they have been frequently used by laypeople around the world beyond its original definitions (El-Bermawy, 2016; Grimes, 2017). In China, how to understand information homogeneity even became the essay topic of the 2020 college entrance exam, arguably the largest nationwide exam globally (The Essay Topic, 2020). Employing the theoretical approach of folk theories allowed us to supplement the previous studies on behaviors of information homogeneity with an interpretivist perspective.

While abundant studies have examined folk theories of various communication phenomena (e.g., Karizat et al., 2021; Ytre-Arne & Moe, 2021), most have not considered the factors shaping their configuration, particularly macro-structural dynamics. We conducted two sets of comparisons to examine two such factors. First, we contrasted folk theories with academic discussions, which can help (1) identify how societal factors, such as academic institutions, shape folk theories circulated in the public and (2) assess how academic discourse has influenced – and can more effectively influence – the public in addressing certain concerns in the current information environment, such as the proliferation of echo chambers.

Meanwhile, given that folk theories reflect the collective thinking of different social groups, they can be largely contextual, which is a characteristic that has hardly been empirically examined previously. Thus, this study further examined *whether* and *how* contextual factors pertain to the configuration of folk theories. Specifically, we compared two very different contexts, China and the US. The two sets of comparisons should suggest a more comprehensive theoretical framework that captures the dynamics forging folk theories.

To conduct meaningful comparisons, we used a mixed-method approach combining computational and qualitative techniques. Previous studies on folk theories largely followed the qualitative tradition. The researchers' geographical location thus often limits the comparability of the design and the generalizability of the findings (e.g., Eslami et al., 2016; Toff & Nielsen, 2018). A large-scale computational analysis based on social media posts, as conducted by many human-computer interaction (HCI) studies (e.g., DeVito et al., 2017), allows us to depict a more general picture. We combined this approach further with qualitative textual analysis to build an empirical pipeline. This research design can also be repurposed easily for other comparative studies.

We analyzed 171,125 tweets from the US, 245,244 Weibo posts from China, and 132 academic papers. Contrary to academic studies that predominantly emphasize algorithms and platforms' roles, laypeople primarily attribute homogenous information experiences' prominence to political actors (the US) and interest-based groups (China). The findings not only pose implications for policymakers, activists, and scholars on how to improve

the current information environment, but also theoretically and methodologically contribute to future research on both folk theories and information homogeneity.

Literature review

Folk theories in communication research

Unlike the scholarships of public understanding of technologies and algorithmic literacy (e.g., Swart, 2021), which primarily focused on knowledge of technological infrastructures, folk theories research goes beyond professional knowledge and technologies. Defined as intuitive explanatory ‘theories’ that the general public, rather than scholars, construct to explain, interpret, and intervene in the world (Gelman & Legare, 2011), folk theories function as important and implicit symbolic resources that people leverage to guide their behaviors. Unlike most academic theories generated by formal procedures, folk theories come from informal sources and reflect diverse understandings among laypeople about their own attitudes and behaviors around these encounters. The popular beliefs encapsulated by folk theories can either complement or conflict with each other (Rip, 2006; Toff & Nielsen, 2018). Folk theories are examined not to identify facts, but to reveal the social annotations behind what people believe. For studies that have particularly focused on information and technologies, this means that folk theories go beyond the technological features of ICT – scholars coin terms such as ‘algorithmic imaginaries’ (Bucher, 2017) and ‘technological imaginaries’ (Suchman, 2014) to highlight the interpretivist nature.

The folk theory perspective has been used widely to identify symbolic resources that ordinary people collectively have constructed to understand a variety of systems, including information and communication technologies (ICTs) (Eslami et al., 2016), biological and other natural systems (Gelman & Legare, 2011), and media practices (Palmer et al., 2020). This perspective is helpful in understanding information experiences, which pertain to both technological (e.g., algorithms) and non-technological factors (e.g., journalism).

Folk theories on the digital information environment

Related to the digital information environment, scholars generally have examined folk theories in the light of algorithm curation and information consumption. We reviewed both lines of literature.

Folk theories on algorithms

Many studies focus on people’s perception of how algorithms shape the information environment and the impacts of folk theories (e.g., Karizat et al., 2021). This line involves two traditions. The first investigates how people explain the functioning of algorithms (Eslami et al., 2016; Liao & Tyson, 2021). Scholars characterized the mental models of how algorithms work as perceived by laypeople (e.g., driven by personal interaction or shaped by general popularity, see Eslami et al., 2016) and factors that influence people’s perceptions of algorithm-based systems.

While these studies revealed folk theories’ intuitive and nonprofessional nature, this tradition mostly was stringent in highlighting the mechanisms and causal reasoning

behind algorithmic functions. The perspective does not include personal attitudes toward and assessments of algorithms within its scope of analysis. As even some highly educated young people are unaware of algorithms' existence (Swart, 2021), these non-causal views may actually comprise a large share of folk theories.

Therefore, DeVito et al. (2017) provided an expanded framework that theorized folk theories as 'intuitive, informal theories that individuals develop to explain the outcomes, effects, or consequences of technological systems, which guide reactions to and behavior toward said systems' (Ibid., p. 3165). The definition considers both causal models, as well as 'opinions and attitudes about possible consequences of how it operates' (Ibid., p. 3165). They identified two sets of folk theories: operational theories, or specific pathways that explain algorithms' functions, and abstract theories, or 'generic, oppositions, and comparison classifications' (Ibid., p. 3169) that articulate algorithms as 'something.' This generalized definition includes a broad range of sensemaking on algorithms by considering an extensive set of folk theories, which could explain people's reactions to algorithms. For example, scholars have found that the operational theories were related to more specific behaviors, e.g., expressions of resistance (also see Dogruel, 2021; Karizat et al., 2021; Ytre-Arne & Moe, 2021; for other related notions, see Bucher, 2017; Siles et al., 2020).

Folk theories on the information environment

While folk theories about algorithms are particularly helpful for understanding people's interactions with the information environment, algorithms do not necessarily dictate users' information use. The second line of literature examined how users generally understand and make sense of their information environments.

Apart from folk theories on technological systems, these studies examine how people make sense of their information environment in general. Scholars in this area do not focus on one particular working system, but rather endeavor to identify various pertinent factors and how they are believed to function, thereby expanding folk theories on the information environment. For example, Toff and Nielsen (2018) investigated folk theories on news consumption in the distributed-discovery mode. They identified three folk theories related to both digital intermediaries ('news finds me,' largely related to social media, and 'information is out there,' pertaining to search engines) and journalism ('I don't know what to believe' about alternative news sources). Many studies also used a similar lens through which to examine other aspects of news consumption, e.g., news trust (Nelson & Lewis, 2021), news avoidance (Palmer et al., 2020), the press/politics relationship (Palmer et al., 2020), the role of local newspaper (Nielsen, 2020), and journalism in general (Palmer, 2019; Wilner et al., 2021). They mostly drew from a notion of culture as a toolkit that provides a repertoire of strategies for action to guide daily life (see Swidler, 1986). This broad perspective allowed us to examine how people understand their information environment by considering a wider range of factors without presumably focusing on technical aspects, e.g., algorithms.

Academic theories of information homogeneity and folk theories

To theorize information homogeneity concerns, scholars coined various concepts, e.g., echo chambers (e.g., Jamieson & Cappella, 2008; Sunstein, 2017), filter bubbles (e.g., Pariser, 2011), information cocoons (Sunstein, 2006), cyberbalkanization (Alstynne &

Brynjolfsson, 1996), and the splinternet (Malcomson, 2016). The literature clearly differentiated between these notions, but laypeople often use them interchangeably (Arguedas et al., 2022).

While scholars have not yet reached a consensus on the prominence of such phenomena (positive evidence: González-Bailón et al., 2023; Iyengar & Hahn, 2009; Stroud, 2011; negative evidence: Fletcher & Nielsen, 2017; Webster & Ksiazek, 2012), most agree that an extensive set of factors collectively determine the allocation of media attention (Thorson & Wells, 2016). Especially, many highlight the role of digital platforms and algorithms (e.g., Flaxman et al., 2016; González-Bailón et al., 2023; Pariser, 2011; Scharnow et al., 2020). Yet, accumulating evidence has shown that recommendation algorithms increase information diversity rather than limit it (Arguedas et al., 2022). Bruns (2019) further criticized the academic fad of blaming information homogeneity on technology, arguing that such attribution exercise comfortably absolves scholars of responsibility for other societal problems, thereby hindering actions to address them.

Meanwhile, since the extent to which laypeople have access to academic discourse remains largely underexamined, they may not be constrained by academic frameworks of causation attribution, allowing them to develop more diverse ways of making sense of their experiences. Previous studies have largely overlooked how individuals interpret their information experiences based on limited academic knowledge. Thus, given the lack of direct evidence on folk theories regarding homogenous information experiences, we asked:

RQ1: What are the folk theories of echo chambers and related phenomena of homogeneous information experiences?

As discussed above, the comparison between folk theories and academic theories should illuminate the impact of scientific discourse on folk theories. Accordingly, we further proposed the following research question to examine how the ways in which the public understands these notions converge with or diverge from academic discussions, from which concepts about information homogeneity originate:

RQ2: What are the differences between folk theories and academic discussions about echo chambers and related phenomena of homogeneous information experiences?

Contexts shaping folk theories: comparing the US and China

Given the informal nature of folk theories, multiple factors can shape their configurations. Previous studies have extensively examined the relationship between individuals' lived experiences (Eslami et al., 2016; Toff & Nielsen, 2018), personal characteristics (e.g., LGBTQ + identities, see Karizat et al., 2021), and folk theories. Besides these agent-centric lenses, scholars have also examined the exogenous dynamics including media coverage and discussions on social networks (DeVito et al., 2018), as well as other contextual factors, including prominent technical actors such as platforms (DeVito, 2021).

Few studies briefly noted that the manifestation of folk theories also relies on specific contextual characteristics (e.g., Thurman et al., 2019). Empirical cross-context comparisons, which should illuminate the impact of contextual factors, remain scarce. Previous studies (e.g., Mont'Alverne et al., 2023) showed that people's perception about the information environment is shaped by both their direct experiences and the cultural

narratives of contexts. We thus examined two contexts – China and the US – with distinctive social and technological systems.

With its two-party system and the proliferation of partisan media, US society was characterized by political polarization among individuals and ideological segregation of audiences (Barberá et al., 2015; Iyengar et al., 2019; also see Dubois & Blank, 2018; Guess et al., 2018). Partisan echo chambers' prominence in both media coverage and public expression should let the folk theory about echo chambers in the US pay more attention to political dynamics.

However, overt discussions about political dynamics may not prevail in other contexts. In China, the government exercises tight control over news media and recently expanded oversight to social media (Tu, 2016; Zhang & Guo, 2019), leaving limited room for political discussions and politicization of other issues, including homogeneous information consumption. Instead, previous studies have documented how interest-based or identity-based groups mostly dominate major social media platforms in China (e.g., fan groups; see Zhang et al., 2022). Prominent group dynamics may shape the configuration of folk theories.

Hence, the comparison between these two contexts, which differed along multiple dimensions, should illuminate how social and political factors shape folk theories' configuration. Given that previous studies leave limited clues, we ask:

RQ3: What are the differences in folk theories about echo chambers and related phenomena of homogeneous information experiences between the US and China?

Methods

Data

We followed previous HCI studies that examined social media discourse to understand folk theories (e.g., DeVito et al., 2017) and gathered three datasets in this study: two social media datasets (US Twitter (now X) and Weibo, a Chinese counterpart of Twitter) – which allowed us to compare folk theories in two contexts – and one dataset of academic studies, found through a search in the Web of Science database, which informed us on the difference between academic discourse and folk theories of the public.

We selected these two platforms because they most effectively capture open, text-based discourse in their respective sociocultural contexts. Unlike Facebook and WeChat, where interactions are largely semi-private or private, Twitter and Weibo provide predominantly public spaces for visible exchanges on social and political issues, enabling observation of public narratives and attributions. Compared with highly visual, entertainment-oriented platforms such as TikTok and Douyin, both remain text-centric, supporting the linguistic and argumentative depth required for analyzing lay conceptualizations of information homogeneity. In terms of demographics, the two platforms offer relatively balanced user compositions that enhance their representativeness as proxies for broader public discourse (see Table A1): Weibo's user base is close to gender-balanced, whereas alternatives such as RedNote are heavily skewed toward female users. X users in the US show a moderate male skew, while Instagram – despite a more even gender distribution – primarily hosts lifestyle rather than public-affairs content. Both platforms also attract large segments of young and middle-aged adults, key groups that actively participate

in online public discussions. Taken together, although neither platform fully represents the entire population of the US and China, both serve as the most appropriate and accessible proxies for observing public discussions on information homogeneity.

The three datasets share an identical time window: April 14, 2021, to April 13, 2022.¹ Based on a preliminary analysis of sample posts, we compiled a list of widely used keywords and searched them on both platforms. They are ‘echo chamber*,’ ‘filter bubble*,’ ‘internet balkanization,’ ‘online balkanization,’ ‘information cocoon,’ ‘cyber-balkanization,’ ‘splinternet,’ and ‘cyberbalkanization’ on Twitter, as well as their Chinese translations on Weibo (see Appendix IV for Chinese keywords and dictionary validation). We also conducted a validation to ensure that these keywords included the most popular terms people used to discuss homogeneous information experiences. As the focus of this study was to examine how laypeople understand these terms, we did not differentiate between them even though we were aware that they have different theoretical meanings. The overall research design is summarized in Figure 1.

We conducted an additional test to determine whether the users discussing these experiences on social media were academics. We sampled 100 accounts from each social media platform and manually coded their types based on account names and descriptions (see Appendix II). Of the sampled 100 posts in both contexts, only 4% (Weibo) and 6% (Twitter) were posted by academics (broadly defined, including non-social science researchers and professional knowledge sharing accounts). The posts we analyzed were predominantly from laypeople.

US tweets

We collected a US Twitter dataset through Brandwatch, a third-party social media analytical tool. Along with the tweets’ messages, we gathered metadata, including location, publishing date, and followers of the tweeting accounts. To keep the data comparable, we only used tweets published in the US and within the designated time window, which elicited 171,125 tweets. Weibo data included reposted content along with original posts (see below), so we further leveraged Twitter Academic API to collect retweeted content to ensure a fair comparison between Twitter and Weibo data.² We also collected data on the number of followers and publishing date of each tweet as control factors for the STM model and robustness checks.

Weibo posts

We obtained Weibo data from TRS NetInsight (拓尔思网察大数据), a third-party data platform that provides social media data. Using the same search conditions, we collected 245,244 relevant posts.

TRS NetInsight only provides fields that include usernames, texts, publishing time, and URLs, so we further used a web crawler, ‘weibo-crawler,’ to collect data on the number of followers for each user. This measure was used to conduct robustness checks (see below).

Academic papers

To compare the difference between folk theories and academic theories, we collected a set of academic articles from journals indexed in the Web of Science database by searching the list of keywords mentioned above in all fields. Given that studies about echo chambers and related phenomena are cross-disciplinary, we collected journal articles

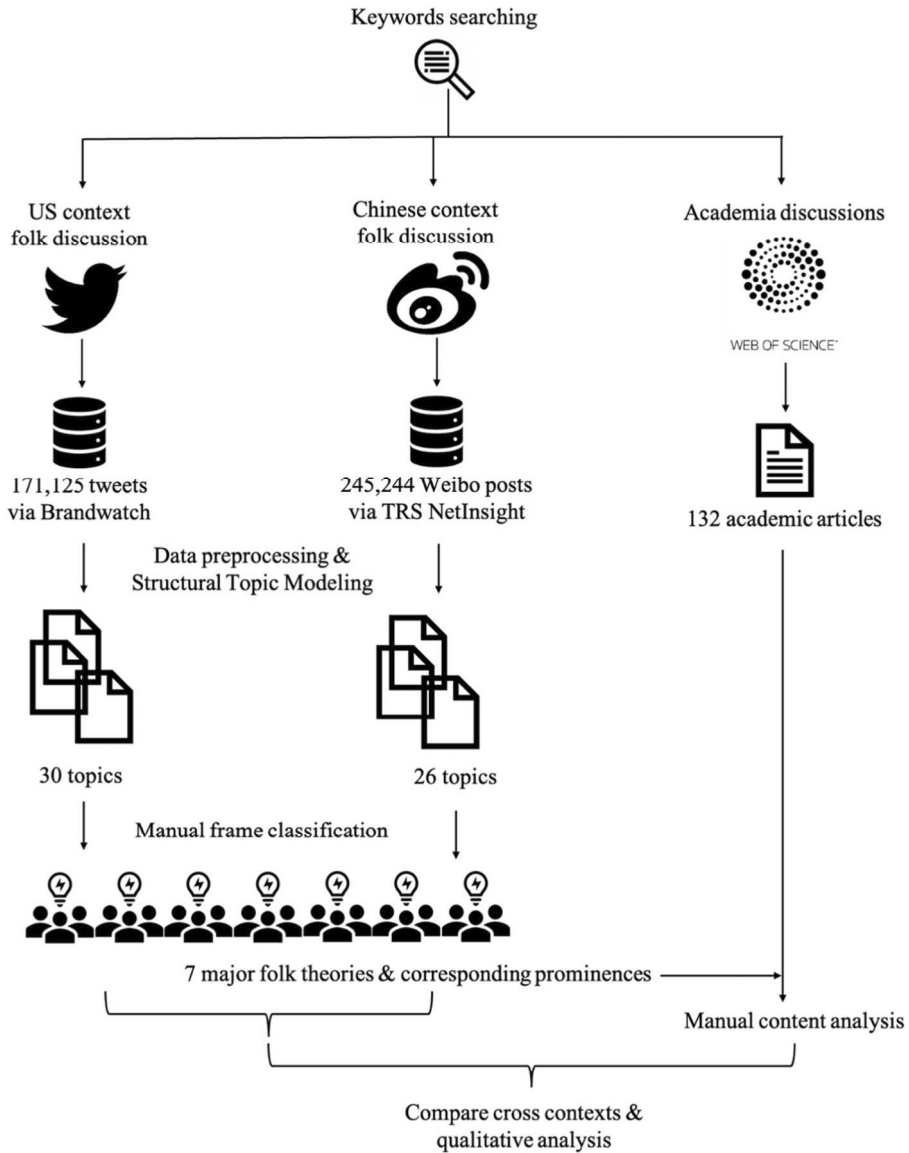


Figure 1. The analytical framework.

not only from the communication field, but also from information science, sociology, psychology, law, economics, and other fields. After removing book reviews, the dataset comprised a total of 132 academic articles published within the time window we observed. Titles, keywords, and abstracts were gathered for further analysis.

Analysis strategy: a mixed approach

To explore users' perspectives across contexts with both breadth and depth, we applied an inductive and mixed-methods approach that combines quantitative framing analysis

and qualitative textual analysis to extract folk theories from the social media posts. We also included a content analysis of the scholarly papers to illustrate the formal theories.

Framing analysis as heuristics for folk theories

While theory refers to interpretive packages (Gamson & Modigliani, 1989), they possess certain structures. Thus, we utilized the technique of framing analysis to understand the structure of folk theories. Frames work as ‘central organizing ideas’ (Gamson & Modigliani, 1989, p. 143) and can be used to ‘diagnose, evaluate, and prescribe’ to highlight certain causes, evaluations, and solutions to problems (Entman, 1993). These functions parallel those of folk theories, which ‘organize experience, generate inferences, guide learning, and influence behaviors and social interactions’ (Gelman & Legare, 2011). Building on the tradition of using framing to study interactions with artifacts such as technologies (Davidson, 2006), we interpret framing analysis results as heuristics, which indicate the general structure of folk theories.

Given that information homogeneity is shaped by evolving factors (e.g., new algorithms and platforms), this study does not apply existing frames or prior folk theories focused on particular technologies. Instead, we inductively generate frames to capture folk theories of the focal topic. Recent methodological advances demonstrate the value of large-scale text analyses for inductively identifying frames (Walter & Ophir, 2019; Zhang & Trifiro, 2022). Integrating framing analysis with computational content analysis thus enables cross-context comparisons and alignment between folk and academic theories.

Computational pipelines to identify folk theories

To summarize the folk theories in both countries inductively, we applied STM, an unsupervised machine learning method (Roberts et al., 2013), to Twitter and Weibo data, since STM enjoys the advantage of being able to include covariates compared with traditional topic modeling methods, e.g., latent Dirichlet allocation (LDA).³ For text preprocessing and the procedure tuning the number of topics, see Appendix III for more details.

‘Topics’ generated by the model refer to co-occurring clusters of words that should carry semantically similar meanings. As this mathematical model’s resolution may not fully match our theoretical approach’s granularity (in this case, frames), several scholars classified the ‘topics’ further into groups. We followed Nicholls and Culpepper (2021) and Zhang and Trifiro (2022): The ‘topics’ were categorized manually into different topic packages, and each topic package corresponded to a folk theory. Guided by Entman (1993), we specifically identified four types of topic packages: causal interpretation, effects exposition, treatment recommendation, and others. In this way, we were able to analyze folk theories about echo chambers from both inductive (from massive texts to ‘topics’) and deductive (from ‘topics’ to topic packages) perspectives. These topic packages and their discourses should denote folk theories of our interests.

Qualitative textual analysis of social media posts

While the topic-modeling-based frames show us the overall structure of each folk theory, we further leveraged qualitative textual analysis to uncover their complexity by analyzing the most representative texts of each theory to interpret and further present the discrepancies between the two contexts.

The selection process comprised two steps: First, for each folk theory, we calculated the sum of prominences from topics belonging to the frame. Next, the texts with the 200 largest values for each frame on the two platforms were analyzed. Both researchers read half of this representative dataset, took notes, and checked each other's findings that they independently characterized from the analyses.

Manual content analysis of academic papers

To investigate RQ3, we conducted a content analysis of pertinent academic articles after analyzing social media datasets. We compiled a codebook (see Appendix III) based on the folk theories that we identified in both Twitter and Weibo datasets. During the nine rounds of training that we conducted, in each round, both researchers independently coded 10% of the articles. We reached an intercoder reliability of 70% (measured by Krippendorff's α).⁴ Two researchers independently coded all articles and addressed all disagreements via discussions to reach a consensus.

Findings

We first conducted a robustness check to confirm that there is no substantive difference between posts published by accounts with varied followers, suggesting that most discussions on echo chambers should be organic (see Appendix IV in SI for more details).

Generally, we identified seven major folk theories under the four categories, involving attribution of homogenous information experiences to groups, political actors, selves, algorithms and platforms, and information *per se*, as well as effects, potential treatment, and others (RQ1). Appendix III presents names and explanations of all folk theories in the two contexts.

More specifically, the seven folk theory packages have distinct focuses: the first attributes information homogeneity to group dynamics, emphasizing the influence of interest-based and identity-based groups. The second frames phenomena such as echo chambers as the result of individual choice, highlighting issues like intentional selective exposure and closed-mindedness. The third package points to a problematic information environment – including misinformation, rumors, and limited information flows – as the cause of homogeneity. The fourth and fifth packages resemble conspiracy theories, placing blame on actors beyond individual users, such as platforms and powerful figures like politicians, opinion leaders, and partisan media. The last two packages, unlike the previous attribution-focused ones, concentrates on the downstream effects of information homogeneity on group mindset, cultural production, and opinion climate in general, as well as on treatments for addressing pertinent issues.

We further compared the social media datasets and academic studies (RQ2). Moreover, a closer look was taken to compare folk theories about information homogeneity in China and the US (RQ3), which should illuminate how contextual factors shaped folk theories.

When folk theories converge

This section's findings answer RQ2. We discussed the common patterns in theories from both contexts and compared academic theories and folk theories. [Figure 2](#) presents the

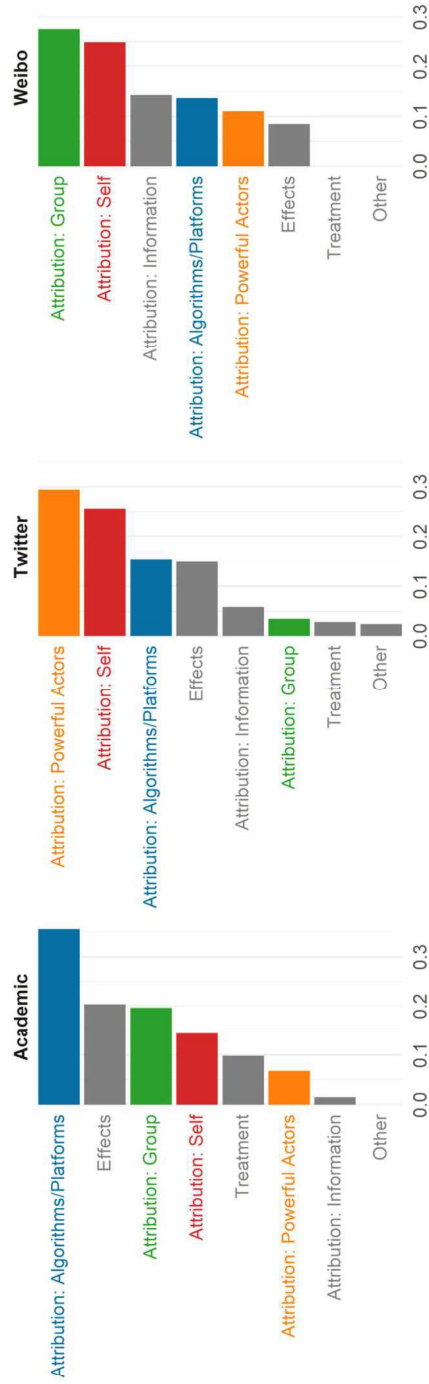


Figure 2. Each folk theory’s prominence in two contexts and each theory’s prominence in academic journals.

Note. For social media posts, each folk theory’s prominence was measured as the sum of the average prominences of all topics belonging to the folk theory. For academic papers, each article can be coded as related to multiple categories. The codebook of the content analysis of academic papers can be found in Appendix VI.

prominence of different folk theories in both contexts. The very first thing we observed was that most folk theories were about attributions, rather than effects or treatments. [Figure 2](#) also presents the distribution of folk theories among academic journals published during the same period.

Differences between academic theories and folk theories

Overall, academic papers and social media discussions have shown distinctive patterns in folk theory distributions. More than 35% of journal articles highlighted platforms and algorithms' role in facilitating the rise of echo chambers and related phenomena, followed by discussions about the effects. Studies attributing echo chambers to platforms and algorithms typically highlight how these systems enable like-minded online networks and employ algorithms to curate largely homogenous information (e.g., Rhodes, 2022). Many studies conducted empirical tests of these proposed mechanisms, which produced mixed findings, with some challenging this notion (e.g., Fletcher et al., 2023). Academic research has also examined the downstream effects of echo chambers, ranging from misinformation exposure (Rhodes, 2022) to radical behaviors (Wolfowicz et al., 2023). These investigations of effects were generally grounded in detailed conceptual frameworks and rigorous scientific methods – approaches that were far less evident in social media discussions.

Contrarily, folk theories in both the US and China did not emphasize algorithms and algorithm-driven platforms' role. The prominences in both contexts were only around 15% ([Figure 2](#)), ranking after the attributions of political actors, groups, and selves. Even when very few social media posts mentioned algorithmically driven platforms, they tended to focus on platform users or policies rather than algorithmic mechanisms. Some posts depicted platforms as user communities, emphasizing group dynamics instead of technological functions. For instance:

Twitter is not the majority. Twitter is not how 80% of the outside world moves man. The way we see news on here, the way certain topics are discussed, the stories. It's not the norm. So, I can see why things in the echo chamber feel like it, but they ain't' (prominence = .86).

Other platform-related posts were related to the proposal or implementation of pertinent policies. For example, on Twitter, many tweets discussed the Filter Bubble Transparency Act and suggested that the act should change homogeneous communication patterns that indicated an impact from platforms and algorithms on forging information homogeneity: *'The Filter Bubble Transparency Act would require companies like Meta to offer a version of their platforms that runs on an 'input transparent' algorithm that doesn't pull on user data to generate recommendations'* (prominence = .62). Many posts on Weibo also were triggered by regulations that the Chinese government rolled out. One Weibo post started with the first few words, highlighting *'Cyberspace Administration of China banned PUSH pop-up'* and mentioned that one regulation was to prevent *'abuse of algorithm recommendation for personalized PUSH pop-up window, exacerbating 'information cocoon''* (prominence = .99). In short, folk theories diverge from academic theories by downplaying the role of algorithms and highlighting other non-technical aspects of platforms.

Self as a powerful agency

Aside from the limited discussions on attribution to algorithms, another common pattern across the two contexts was the prominent role of self in forging homogeneous

information experiences. In both countries, this folk theory comprised about 25% of overall discussions and was ranked as the second most prominent frame in both contexts.

More specifically, folk theories discussed two mechanisms. First, posts in both contexts argued that information avoidance was a principal approach, i.e., users voluntarily remained in the bubbles and refused to read counter-attitudinal opinions. On Twitter, to describe someone the account talked to, one post wrote:

He only wants to be in his own echo chamber while throwing darts outside of it. He blocked me, but then unblocks when he sees a person tweet something, then he retweeted me and immediately blocked me so there's no way to converse (prominence = .75).

A similar mechanism could be found on Weibo: *'Many audiences do not use Weibo. They are in the information cocoon created five years ago, and they intuitively refuse to accept different information. They choose not to read the fact that they are not willing to face'* (prominence = .99).

Another important mechanism highlighted in both contexts was individuals' cognitive bias or close-mindedness. On Twitter, one tweet stated: *'I don't live in an echo chamber. I do look at other points of view to see if there are valid arguments to be made. See also confirmation bias'* (prominence = .68). On Weibo, one post mentioned several individual factors that explained the presence of an echo chamber:

Most people are still immersed in the information provided by the media and have not had the opportunity to truly access the firsthand evidence that has been disclosed. Additionally, it is questionable whether they possess basic logical reasoning and empathy abilities. Therefore, attempting to persuade people in their filter bubbles through analyses is a difficult, yet not appreciated task. A single barbaric accusation of 'lying' can defeat all reasoning (prominence = 1.00, expression slightly tweaked for clarity).

Interestingly, some posts even viewed being in echo chambers as a type of mental illness, attributing homogeneous information experiences entirely to one's mental status. One Weibo post mentioned that during the COVID-19 pandemic, psychology experts suggested that *'many people in the whirlwind of the epidemic lock themselves in their homes, unconsciously caught in an information cocoon. Helping them to get out of the cocoon is an important task of current psychological services'* (prominence = .98, expression slightly tweaked for clarity).

When folk theories diverge

While we noticed less attention on algorithms and more on self-agency in folk theories compared with academic theories, divergence also emerged between the two contexts. Overall, public discussions in the US indicated a stronger tendency toward attributing information homogeneity to political actors. However, most Chinese social media users blamed group dynamics, particularly interest-based or opinion-based groups. Our analyses revealed different folk theories within the two contexts (RQ3).

Political actors as a major attribution in the US

In the US folk theories, the most prominent frame was to blame powerful actors, especially political figures, for generating information homogeneity (29% of the

discussion), while this folk theory comprised only 11% of Chinese posts. More specifically, US users predominately referred to political actors as mainstream/partisan media and political figures. Several tweets used similar expressions like ‘the left-/right-wing media echo chamber.’ Political commentators or TV anchormen/anchorwomen were common targets of attacks. One Twitter user complained: *‘Tucker Carlson simply cuts off the conversation when an alternate sentiment intrudes. Notably, Tucker claims ludicrously that because of protests against police violence, the whole country is ‘boarded up’* (prominence = .96). Another tweet provided an in-depth analysis of news media’s role in reinforcing information homogeneity:

Fascinating thread where CNN stars slowly admit that their rhetorical posture – everyone who dissents in any way from our decrees is racist and/or stupid – is alienating and ugly, but they didn’t realize this because they live in an ‘echo chamber’ of like-minded liberals (prominence = .89).

Interest – or opinion-based groups as a major attribution in China

However, group attribution captured the most attention in the Chinese context (28%), with only 3% in the US tweets. Groups’ annotations also registered slight differences between the two contexts: Although both attributed information homogeneity to groups, US users referred to race- or gender-based groups, while Chinese users focused on interest-based communities. One prominent example of interest-based groups is fandom groups. One post highlighted a progressive route for fandom groups to form echo chambers, including the role of influential fandom members:

[...] at first claiming to be a neutral stranger and just coming to disseminate the knowledge of the Chinese entertainment industry. She also reposted a few elaborated rumor-refuting posts, which attracted a lot of fans’ attention. [...] She initiated several debates and identified fans who doubted her as ‘noxious.’ Her supporters also launched several large-scale banning activities of the dissonances. These effectively formed echo chambers (prominence = .99).

Contrarily, US tweets attribute less to groups (3%). Even when they framed echo chambers as a group-based phenomenon, the usual foci were race, gender, and sexuality issues, and were attributed to certain group features. For example, the following tweet defined divergent platform usage practices between gender groups as echo chambers:

Look, there is a segment of Black women that use Twitter and Clubhouse to demonize and spread hatred toward Black men. There is also a segment of Black men that use YouTube as (an) echo chamber to demonize and spread hatred of Black women. Just be mindful of both (prominence = .74).

Discussion

This study investigated folk theories on homogenous information experiences in contrast with academic theories. Large social media datasets were collected from two contexts: China and the US. The findings indicate that while some similarities were observed between the two contexts’ folk theories, significant differences were identified. Notably, different from the algorithm focus of academic studies, both folk theories on Twitter and

Weibo did not emphasize platforms' and algorithms' roles. They commonly attributed the proliferation of echo chambers to ourselves through active avoidance and cognitive bias. However, the two folk theories diverged on the attributions of the manifestation of homogenous information experiences: Folk theories on Twitter were highly politicized and referred to powerful political actors as the determining driver, whereas Weibo users blamed interest-based groups, e.g., fandom communities, for the prevalence of information homogeneity.

Our studies carry both theoretical and practical implications. Theoretically, the findings demonstrate that information homogeneity – regardless of its actual causes – in fact is not solely attributed to platforms and algorithms, as much of the existing academic literature suggests, but also to groups and individuals (e.g., power political actors). The prevalence of partisan discourse in the U.S. Twitter sphere and the dominance of interest groups on Weibo offer contextual explanations for the divergent attribution frames observed in the two cases. These findings resonate with Bruns's (2019) call to examine information homogeneity beyond the technological domain and underscore the importance of considering how lay audiences conceptualize information homogeneity behind their informational behaviors. While most previous comparative research on echo chambers and related phenomena employed behavioral trace data (e.g., Fletcher & Nielsen, 2017), the similar behavioral pattern may refer to various experiences and meanings of users (Toff & Nielsen, 2018), as the current study identified huge differences in the meaning-making between different contexts. Therefore, a similar result in terms of the measures derived from audience *behaviors* should not be interpreted as having common information *experiences*.

More importantly, the two comparative dimensions – between academic and folk theories, and between the U.S. and China – underscore the influence of contextual factors in shaping folk theories. Previous studies that have focused on a single context, while offering valuable descriptions and mappings of folk theories and their potential consequences, have largely overlooked this critical contingency (e.g., Toff & Nielsen, 2018). Our findings reveal that folk theories concerning the same concepts can vary substantially across sociopolitical and cultural contexts. Accordingly, we propose a framework to capture the contextual nature of folk theory configurations (Figure 3). Contextual contingencies must be taken into account when extracting folk theories from laypeople's everyday expressions, as this constitutes both a theoretical and methodological concern. Meanwhile, such contextual factors should also inform the interpretive process, inviting

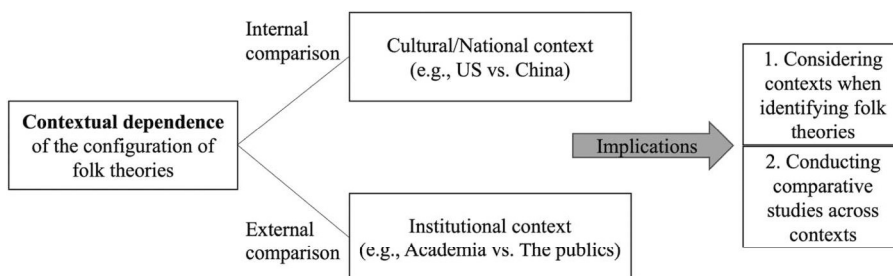


Figure 3. Proposed framework of the contextual contingency of folk theory configurations.

the incorporation of more nuanced qualitative textual analyses. Future studies should thus conduct comprehensive cross-contextual examinations of folk theories, integrating a broader array of structural factors into analysis, to better illuminate the dynamic processes that shape their formation and evolution.

Practically speaking, our findings also pose civic implications for media activists and scholars. The striking mismatch between folk theories in both contexts and academic theories suggests that coordinating massive, especially cross-national, resistance against certain engineering decisions through a media literacy approach may be challenging. Scholars have long documented correspondence between folk theories and user reactions (Dogruel, 2021; Karizat et al., 2021; Ytre-Arne & Moe, 2021). In particular, platform-specific folk theories often were associated with an actionable form of resistance (DeVito et al., 2017). While academic theories are dominated by platform-related theories that characterize technological systems' impact, this exercise has yet to penetrate the public domain and shape folk theories accordingly. This lack of algorithm- and platform-related folk theories may reinforce the digital inequality (Gran et al., 2021), and hinder the manifestation of collective actions against malicious technological reconfigurations (DeVito et al., 2017).

Our research also made significant methodological contributions. The inclusion of quantitative framing analysis and qualitative textual analysis in the study of folk theories provides a practical approach that can be repurposed for similar questions. This approach is particularly useful in explicating the folk theories surrounding artifacts that were associated with specific outcomes and called for certain actions, as the framing analysis employed here effectively highlights pertinent discursive components. This mix-method approach is particularly useful in comparative studies of folk theories for two reasons: First, the topic-modeling-based method allows large-scale comparison of the general frames in various data sources. Second, the qualitative technique supplements the analysis with more nuanced contextual information and interpretation. In sum, our formal analytical procedure also paves the way for conducting comparative studies across other contexts and domains, which should help us surpass mere descriptions of folk theories by characterizing the dynamics that account for their configurations.

This study is not free from limitations. While we selected two highly different contexts – the US and China – to demonstrate contextual factors' impacts, we admit that these two countries cannot represent all societies. Future research should include additional contexts. Also, the selected platforms are not fully representative of the general populations in either context. Future research could extend this work by comparing similar platforms across contexts or exploring newly emerging social media that attract users from both countries.

Additionally, although topic modeling enabled large-scale text analysis, this token-based method may miss linguistic subtleties such as sarcasm. Even with qualitative supplements, it cannot substitute for interviews. Finally, our analysis focused on social media discourse, where folk theories may differ from those in other contexts. Exploring how such theories circulate among diverse publics and what factors shape them warrants further investigation.

Notes

1. Most publications on Web of Science do not provide an exact date – only the month of publication – so we employed a time window between April 2021 and April 2022 for this dataset.

2. From Brandwatch, we can access only the content of tweets themselves without the retweeted content, which often was displayed on the timeline of the user interface together. This suggested that we should combine the retweeted content with the tweet together as the unit of analysis. We leveraged Twitter Academic API to request the retweeted content of all retweets. Each post in this dataset comprised both tweets and retweets (if any).
3. We also considered the number of followers of authors and the month in our model, as they potentially influence the prevalence of the ‘topics’ (we used quotation marks, as ‘topic’ is the name used by adopted R package ‘stm’) in the social media posts.
4. We conducted nine coding rounds because certain items were scarce, and reaching consensus was difficult. To advance the measures’ validity, we leveraged a conservative measure of intercoder reliability (Krippendorff’s α), and we let both coders code all items and address disagreements one by one.

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No potential conflict of interest was reported by the author(s).

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Data availability statement

The data underlying this article cannot be shared publicly due to ethical concerns.

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