

Reversible Liquid Networks: Modular and Elastic Social Relations in Digital China — A Case Study of Xiaohongshu

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Abstract. In the digital era, algorithms and data systems have profoundly reshaped social relations in China, transforming traditional structures into fluid, dynamic networks. Drawing on Fei Xiaotong's "differential mode of association," which views Chinese society as ego-centered with graded ties, and Zygmunt Bauman's "liquid modernity," emphasizing transient and unbound interactions, this study introduces the concept of a "reversible liquid differential order." This framework captures how social ties form, dissolve, and reconfigure rapidly in digital contexts, particularly on platforms like Xiaohongshu, a social e-commerce app targeting young women. The research explores modular and elastic social relations on Xiaohongshu through a qualitative case study. Data were collected from 20 public notes and approximately 50 related comments under the #LifeSharing tag in 2025, selected for high interaction levels and relevance to relational dynamics. Thematic analysis was employed to code patterns, identifying themes such as temporary connections, algorithm-driven intimacy gradients, and guanxi culture. Findings revealed that Xiaohongshu's algorithms curate personalized content, fostering ephemeral ties through notes, comments, and recommendations, while users adapt with resilience. The study concluded that this reversible order integrates cultural specificity with algorithmic elasticity, enhancing user well-being but also amplifying social anxiety. Theoretically, it advances network analysis for quantifying cultural patterns; practically, it informs platform designs to mitigate relational uncertainties in digital China.

Keywords: Reversible liquid networks, Digital social relations, Xiaohongshu, Guanxi culture, Algorithmic elasticity

1. Introduction

The digital era, driven by algorithms and data systems, has profoundly reshaped social relations in China. Fei Xiaotong's "differential mode of association" conceptualizes Chinese society as ego-centered networks with graded ties, while in the digital context these structures acquire fluidity, resonating with Bauman's notion of "liquid modernity." In this sense, the traditional order is not replaced but reconfigured into a "reversible liquid differential order," where ties form, dissolve, and reconfigure rapidly. Xiaohongshu, a social e-commerce platform, exemplifies this process: users build dynamic ties through notes, comments, and recommendations, while algorithms curate personalized content and shape relational patterns.

Existing studies on WeChat reveal the paradox of “shulian” (alienation and connection), highlighting uncertainty in digital interactions. On Xiaohongshu, this is visible in topics such as #SocialObservations or #LifeSharing, where algorithms model ties as evolving networks. This study therefore asks: how can the reversible liquid differential order be modeled on Xiaohongshu, what elastic mechanisms underpin it algorithmically, and how do users adapt and display resilience?

Theoretically, this research reconstructs Fei’s differential order in dialogue with Bauman’s liquidity, proposing a novel framework for understanding digital social relations in China. It also advances understanding of how network analysis can quantify cultural patterns in China. Practically, it informs platform design to enhance user well-being. Methodologically, the study adopts a qualitative case study of Xiaohongshu, with the paper structured into literature review, methodology, case analysis, discussion, and conclusion.

2. Literature review

2.1. Classic theories of social relations and their limitations

Fei Xiaotong’s *From the Soil* introduced the “differential mode of association,” conceptualizing Chinese social relations as ego-centered networks where ties are graded by proximity and intimacy, emphasizing elasticity and reciprocity [1]. Rooted in rural kinship systems, this model reflects the core of Chinese *guanxi* (social connections) culture. Hwang’s “face and favor” theory further conceptualizes social exchanges as networks of obligations, underlining the embedded power dynamics [2]. In Western sociology, Granovetter’s “strength of weak ties” illustrates how peripheral connections facilitate information flow and innovation, offering complementary insights for *guanxi* studies [3].

However, these classical frameworks share a focus on relative stability, reciprocity, and hierarchy, which limits their explanatory power in the digital era. Although some studies suggest that the differential mode persists in urban and digital contexts, such as through hybrid media like WeChat [4], they often neglect the fragmented and transient nature of algorithm-driven interactions.

2.2. Fluid uncertainty in modernity and liquid theory

To address the limitations of classical models, Bauman’s *Liquid Modernity* argues that contemporary social relations are transient, unbound by traditional anchors [5]. In China, this is evident in youth culture, as Lin illustrates through the “Dazi” phenomenon, where university students engage in fast-paced, fragmented interactions reflecting accelerated modern life [6].

On Xiaohongshu, this liquidity is further intensified. User-generated content such as #LifeSharing facilitates ephemeral ties, while algorithmic recommendations accelerate the formation and dissolution of connections. This case illustrates how liquid theory applies to China’s digital youth culture, setting the stage for further analysis.

2.3. Technical architecture of digital platforms and impact on social relations

Xiaohongshu’s algorithmic architecture reshapes social relations through recommendation systems and user-generated content [7]. Its personalized feeds, powered by collaborative filtering and graph neural networks, dynamically model weak ties, fostering cross-cultural and cross-regional connections, such as those observed in post-TikTok user migrations [8]. The platform’s emotional marketing strategies and interactive, user-generated content-based marketing further enhance

relational elasticity, enabling users to form dynamic social bonds through content sharing and community engagement [9, 10].

Mathematical tools like graph theory and network analysis simulate these relational networks, revealing how algorithms adapt to Chinese *guanxi* culture's emphasis on graded intimacy [11]. For instance, user interactions such as likes, comments, and shares create temporary connections, reflecting a digital evolution of the differential mode of association. Additionally, Xiaohongshu's community-building features impact youth psychology, fostering belonging while occasionally amplifying social anxiety [12].

Despite growing scholarship on *guanxi*, liquidity, and platform algorithms, gaps remain. Existing literature often treats social relations as static or unidirectional, overlooking the reversibility and algorithmic dynamism of digital platforms. While Fei Xiaotong's differential mode and Bauman's liquid modernity provide cultural and modern perspectives, few studies integrate these frameworks to analyze social relations on Chinese digital platforms. Besides, research on Xiaohongshu is particularly scarce, with most studies focusing on its marketing strategies or user behavior, neglecting how algorithms shape a "reversible liquid differential order" through mathematical modeling, such as dynamic network analysis. Moreover, the interaction between algorithms and *guanxi* culture remains underexplored, particularly how recommendation systems adapt to Chinese users' preferences for "face" or "favor."

This study proposes a "reversible liquid differential order" framework, merging liquid modernity with the differential mode, emphasizing algorithmic elasticity, and testing its applicability through Xiaohongshu cases. This framework addresses theoretical and empirical gaps, offering new insights into the cultural specificity of social relations in digital China.

3. Methodology

This study employs a qualitative case study approach, using Xiaohongshu as a case to explore the "reversible liquid differential order" through user interactions and algorithmic recommendations. Guided by Fei Xiaotong's differential mode of association and Bauman's liquid modernity, the research focuses on the fluidity and elastic control of social relations.

Data were sourced from 20 public notes and approximately 50 related comments under the #LifeSharing tag on Xiaohongshu in 2025, collected manually through platform browsing. Selection criteria prioritized notes with high interaction volume (e.g., at least 200 likes and 20 comments) and content explicitly reflecting social relations or lifestyle sharing (e.g., travel check-ins, food recommendations, or gift suggestions that prompt communal responses), ensuring alignment with the research questions on relational dynamics.

Thematic analysis is used to manually code notes and comments, identifying themes such as "temporary connections," "algorithm-driven intimacy gradients," and "*guanxi* culture." The process involves (1) organizing data into text, (2) coding patterns linked to the theoretical framework, and (3) synthesizing 2-3 core themes to validate the "reversible liquid differential order."

The study uses only public data, anonymizing user identities and adhering to Xiaohongshu's data usage policies. Findings will address the impact of algorithms on user social experiences.

The study is limited by the small data sample and the accessibility of algorithmic details. Thematic analysis may be subject to interpretive bias, and conclusions focus on theoretical validation with limited generalizability.

4. Case study: reversible liquid differential order on Xiaohongshu

4.1. Case background

Xiaohongshu, a social e-commerce platform with over 300 million monthly active users in 2025, primarily targets women aged 18-35 and integrates social networking, e-commerce, and content sharing. Its recommendation algorithms, facilitated through #LifeSharing notes, foster dynamic and fluid social networks. Xiaohongshu's distinctive ecosystem serves as an ideal case for examining the "reversible liquid differential order," reflecting the digital transformation of Chinese youth culture and its interplay with guanxi (social connections) culture. Algorithm-driven recommendations and user-generated content—such as travel check-ins and food sharing—enable the rapid formation, dissolution, and reconfiguration of relationships, aligning with Fei Xiaotong's differential mode of association and Zygmunt Bauman's liquid modernity.

4.2. Analysis and findings

This study employed thematic analysis on 20 #LifeSharing notes (published in 2025) and their associated comments, identifying key themes of the "reversible liquid differential order": temporary connections, algorithm-driven intimacy gradients, and guanxi culture. These themes interweave to illuminate the dynamic nature of social relations on Xiaohongshu.

Temporary connections are evident in note interactions. For instance, a home renovation note (3,613 likes, 45 comments) showcasing a handmade craft attracted stranger comments, such as inquiries about materials or shared experiences (e.g., "User A: I'm also learning crafts; I'd like to learn from you"). These interactions are typically one-off, with commenters rarely following the poster, embodying Bauman's liquid modernity's ephemerality and reversibility. This temporality, however, is intricately linked to algorithm-driven intimacy gradients. A travel note (1,871 likes, 64 comments) gained significant exposure through algorithmic recommendations, eliciting comments from intimate ties (e.g., friends responding, "Let's go together next time!") and weak ties (e.g., strangers noting, "User B: The city looks amazing"). This demonstrates how algorithms dynamically adjust the differential mode's intimacy structure, enhancing relational elasticity in both formation and dissolution.

Moreover, guanxi culture reinforces these dynamics. A food recommendation note (300 likes, 25 comments) extends beyond meal sharing to social contexts, with comments reflecting admiration or shared intentions (e.g., "User C: Looks delicious, let's try it at our next gathering!"), signifying the digital evolution of "favor" obligations. Likewise, a fashion outfit note (2,219 likes, 73 comments) highlighting stylish clothing prompted "face"-related responses (e.g., "User: D: Every outfit is stunning!"), while a gift recommendation note (275 likes, 42 comments) offered thoughtful suggestions (e.g., "User E: Wow, I love all these!"), illustrating the elastic control of social bonds. These findings underscore that interactions on Xiaohongshu are not static but emerge from the interplay of algorithms and cultural norms, amplifying relational reversibility and modularity.

4.3. Theoretical validation

The case study substantiates the "reversible liquid differential order" framework. Transient interactions on Xiaohongshu, such as comments from strangers, align with Bauman's liquid modernity, highlighting the ephemerality and fluidity of relations. Algorithms, by dynamically modulating intimacy gradients through recommendations, extend Fei Xiaotong's differential mode

into a digital, elastic form. User sharing reflects the digital evolution of *guanxi* culture, with “face” (e.g., fashion displays) and “favor” (e.g., gift recommendations) enhanced by algorithmic personalization. For example, promoting popular home renovation or travel notes reinforces “face” display and “favor” exchanges. Through Xiaohongshu’s case, this study illustrates how algorithm-driven dynamic networks and cultural specificity shape social relations in digital China, providing empirical support for the theoretical framework.

5. Conclusion

This study introduces the “reversible liquid differential order” framework, integrating Fei Xiaotong’s differential mode of association with Bauman’s liquid modernity to analyze social relations on Xiaohongshu. Through thematic analysis of #LifeSharing notes, findings reveal how algorithms foster temporary connections, dynamic intimacy gradients, and digital *guanxi*, reflecting elastic and reversible social bonds in digital China. The framework enriches sociological theory by quantifying cultural patterns via network analysis, offering insights into platform-driven sociality. Practically, it suggests designing algorithms to enhance user well-being while mitigating social anxiety. Limitations include the small sample size and limited algorithmic transparency. Future research could employ larger-scale quantitative methods or compare platforms like Weibo to deepen understanding of digital social relations.

This study has introduced and substantiated the “reversible liquid differential order” as a theoretical framework for understanding modular and elastic social relations in digital China, using Xiaohongshu as a primary case. By integrating Fei Xiaotong’s differential mode of association, which portrays Chinese society through ego-centered networks of graded intimacy and reciprocity, with Zygmunt Bauman’s liquid modernity, emphasizing the transient and fluid nature of contemporary interactions, the research highlights how digital platforms reconfigure traditional *guanxi* culture. Through a qualitative case study, thematic analysis of 20 #LifeSharing notes and around 50 comments from 2025 revealed key themes: temporary connections formed via ephemeral interactions like one-off comments on crafts or travel posts; algorithm-driven intimacy gradients that dynamically adjust ties from strong (e.g., friends planning gatherings) to weak (e.g., strangers sharing recommendations); and the persistence of *guanxi* elements, such as “face” in fashion displays and “favor” in gift suggestions. These findings demonstrate that Xiaohongshu’s recommendation systems, powered by graph neural networks and collaborative filtering, enable rapid formation, dissolution, and reconfiguration of social bonds, aligning with the reversible and elastic qualities of liquid networks. Ultimately, the framework illustrates the cultural specificity of digital sociality in China, where algorithms not only accelerate relational fluidity but also amplify users’ resilience and adaptability in navigating uncertainty.

In conclusion, this research enriches sociological theory by bridging classical Chinese concepts with modern liquidity, providing a lens to quantify cultural patterns through network analysis. It underscores that digital relations are neither purely stable nor entirely chaotic but modular, allowing users to exhibit resilience amid algorithmic influences. Practically, the insights suggest platform designers should prioritize features that mitigate potential downsides, such as social anxiety from filter bubbles, by incorporating transparency in recommendations and tools for meaningful, sustained connections, thereby enhancing user well-being in an era of rapid digital change.

Despite these contributions, the study has notable limitations. The small sample size of 20 notes and 50 comments, drawn solely from the #LifeSharing tag, restricts generalizability to broader user demographics or other platform sections, potentially overlooking diverse experiences among non-youth or male users. Methodologically, reliance on manual thematic analysis introduces interpretive

bias, as coding depends on the researcher's perspective, and the lack of access to proprietary algorithmic details hinders a deeper technical examination. In terms of literature, while the framework draws on key theories, it could incorporate more recent empirical studies on global platforms like Instagram for comparative depth, addressing gaps in cross-cultural analysis. To improve, future iterations might expand the dataset through automated scraping tools (ethically compliant) or integrate mixed methods, combining qualitative insights with quantitative metrics like interaction graphs to reduce bias and enhance robustness.

Looking ahead, future research could explore comparative studies across platforms such as Weibo or Douyin to assess variations in liquid networks under different algorithmic regimes. Additionally, longitudinal analyses tracking user relations over time might reveal evolving patterns, while incorporating user surveys or interviews could capture subjective experiences of resilience. Investigating the role of emerging technologies, like AI-driven personalization, in amplifying or disrupting guanxi could further refine the framework, contributing to a more nuanced understanding of social relations in an increasingly digitized global landscape.

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