

Dynamic Feedback Structures in Algorithmic Curation: How Youth Interpret and Respond to Crisis Content on Weibo

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Social media platforms have become key infrastructures through which young people encounter, interpret, and emotionally respond to public crises. In Chinese context, Sina Weibo occupies a particularly important position due to its central role in information dissemination and public discussion. Through algorithmically curated feeds and Hot Search rankings, public attention is increasingly concentrated around both commercially and politically prioritized content. Existing research has examined algorithmic amplification, information overload, emotional distress, and online participation while these topics are often treated as separate outcomes. Less attention has been paid to how they interact mutually and dynamically over time to shape young people's experiences of crisis-related information and their responses.

This study adopts a System Dynamics perspective to examine the feedback mechanisms linking algorithmic curation, user engagement, emotional responses, and coping behaviours on Weibo among young users. Eighteen semi-structured interviews were conducted with participants aged 20–22, recruited via snowball sampling to capture a range of engagement patterns from low-frequency browsing to active public participation. Interview transcripts were analysed through a three-stage coding process (initial coding, sub-category development, and main theme generation), focusing on recurring concepts and patterns in participants' experiences. These themes were integrated with insights from a targeted literature synthesis on algorithmic curation and digital well-being to inform Behaviour-over-Time (BOT) charts that depict engagement trajectories and Causal Loop Diagrams (CLDs) that map hypothesised feedback structures driving youth engagement and emotional coping. The resulting qualitative BOTs and CLDs provide a conceptual model of the structural dynamics underlying crisis content exposure and coping practices, and are used to identify potential intervention leverage points and platform governance strategies aimed at mitigating

harmful content spirals and supporting healthier forms of digital public sphere participation.

Five interrelated themes emerged from the analysis and were subsequently formalized in the causal loop diagram. First, participants described a structural transformation of Weibo from a social hub into a controlled and contested public sphere: distrust extended beyond content accuracy to skepticism about platform neutrality and the legitimacy of governance practices. It contributes to lower levels of trust and feeding the trust-erosion balancing loop (B1). Second, users reported forms of algorithmic friction such as involuntary exposure, attention capture, and difficulty disengaging from emotionally charged streams. Alongside perceived manipulation, these experiences reinforce active engagement and strengthen the algorithmic curation and profiling loop (R1). Third, many participants described a shift from active expression toward performative silence, including self-censorship, passive observation, and strategic avoidance of public participation under perceived governance risks, which are captured in the balancing loop (B2).

Fourth, repeated exposure to crisis-related information was associated with affective dissonance, emotional exhaustion, powerlessness, frustration, and political pessimism. It summarized in the psychological cost and emotional burden variables that drive the coping-strategy loop. Finally, participants adopted various forms of agentic resistance, such as content filtering, platform switching, keyword blocking, and temporary withdrawal. These practices are represented as changes in tactical user agency in reinforcing loop R2, indicating that users' attempts to manage emotional burden and relatively win some control over information exposure. In the model, expressive user agency is represented as a stock that accumulates as users gain critical awareness and ability to manage emotional strain and adjust their engagement profiles.

Behaviour-over-time trajectories and CLD analysis suggest that these themes form interconnected feedback processes rather than isolated experiences. A central hypothesised dynamic is that algorithmic curation and user engagement mutually reinforce each other. More engagement produces behavioural traces that refine algorithmic profiling and crisis-content targeting, which can further intensify engagement and exposure (R1). Over time, growing critical awareness of manipulation, perceived governance risks, and accumulated emotional costs act as balancing forces that dampen active participation and encourage more selective, tactical engagement (B1, B2, B3). However, coping strategies do not constitute a straightforward route to

disengagement.

While they may reduce immediate exposure and help users manage emotional burden, they are often enacted within the same platform and feed back into profiling and curation. It's becoming part of the ongoing process of content personalization. In this configuration, users become simultaneously more critical, more emotionally strained, and more strategically adaptive, while continuing to depend on Weibo for information, monitoring, and limited forms of public sphere participation. The CLD makes these tensions explicit as interacting reinforcing and balancing loops that shape crisis-content trajectories over time

Based on these findings, the study extends research on crisis communication and platform governance by showing how trust, participation, emotional strain, and coping behaviors are linked through interacting reinforcing and balancing feedback processes. It also demonstrates the value of integrating qualitative thematic analysis with System Dynamics tools, particularly behavior-over-time trajectories and causal loop diagrams to capture the temporal and structural dimensions of human–platform interaction. Finally, the analysis highlights the distinctive influence of state–platform co-governance in shaping young users' encounters with crisis-related information on Weibo, including how governance intensity, perceived risk, and critical awareness enter the feedback structure that conditions expressive and tactical user agency in the Chinese social media environment.

Keywords: Algorithmic curation, Feedback loops, Behavior-over-time (BOT), Chinese youth, Crisis content, Emotional coping, Weibo (social media platform)