Mitigating the anxiety emotion on consuming personalised feed in Chinese social media

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Abstract. Algorithmic social media feeds curate personalised content, often exposing users to anxiety-inducing posts. While anxiety is typically seen as a negative outcome, my research reveals that many users on RedNote (Xiaohongshu) continue engaging with such content for self-improvement and preparatory coping. However, excessive exposure can disrupt well-being, and existing feed control mechanisms are often ineffective or difficult to navigate. My PhD explores design interventions to help users better understand and manage their anxiety in algorithmic feeds. I investigate LLM-powered anxiety trigger awareness tools, self-tracking visualisations, and tangible reflection devices to support self-awareness, emotional regulation, and more intentional engagement. Through empirical studies and user-centered design, I aim to foster healthier interactions with algorithmic feeds. At ECSCW, I seek feedback on my design decisions and ethical considerations, particularly regarding moderate vs. radical interventions in anxiety-inducing content consumption and the ethical implications of applying LLM technology to non-participant user-generated content.

Introduction

Anxiety has become a national emotion in China (Shi and Zhao, 2011), affecting diverse demographics. While the causes vary, from economic insecurity to status anxiety, they stem from a shared concern (Zhang and Xu, 2013). This phenomenon has been a mainstream media focus and remains widely discussed today (Zong, 2023; Ke, 2023). Over the past decade, platforms like Weibo and WeChat have capitalised on societal insecurities, amplifying anxieties to boost virality and engagement (Berger and Milkman, 2012). A notable example is the article "Mobike Founder Cashes Out 1.5 Billion, Your Peers Are Leaving You Behind," which exceeded 100,000 views but also sparked public criticism, bringing the phenomenon of "creating anxiety" into mainstream Chinese discourse (Huang, 2018; Ma, 2018; of China, 2018).

Since major social media platforms began implementing algorithms and making social media feeds "algorithm-curated", the impact of the "creating anxiety" phenomenon has become more pronounced. These algorithms are designed to maximise user engagement. While such algorithms deliver highly personalised feeds to ensure that users consistently see interest capturing content (Zhang and Liu, 2021), they also promote content eliciting strong emotions such as anger, outrage, and moral indignation (Goldenberg and Willer, 2023). In the context of China, where anxiety is the "national emotion"(Shi and Zhao, 2011), this has evidently become the most algorithmically-efficient way for social media to deliberately amplify virality.

Anxiety-inducing content is widespread, yet unlike excessively distressing topics such as violence, self-harm, or suicide, which are strictly censored on Chinese social media platforms (Li and Zhou, 2024), these posts often revolve around everyday (and potentially aspirational) themes such as beauty, fitness, relationships, parenting, and careers etc. While seemingly mundane, such topics become highly anxiety-inducing through social comparison and are strategically tailored to different demographic groups, creating a host of personalised stressors (Li, 2020). For instance, young professionals are frequently exposed to headlines like "23 Years Old, Half a Million Annual Salary," while parents encounter content warning them, "Dont Let Your Child Fall Behind at the Starting Line." This algorithmic amplification of anxiety-inducing content traps users in a cycle of recurrent exposure, reinforcing their anxieties and deepening their emotional engagement.

Platforms such as Weibo, Douyin, RedNote(Xiaohongshu), and WeChat (Zhang et al., 2021; Zhao, 2021), each with hundreds of millions of active users, have been widely recognised for their role in intensifying anxiety among users and have been the subject of investigations regarding their influence. While prior research has quantified links between psychological anxiety (Li et al., 2021; Liu et al., 2024), appearance-related anxiety (Xu and Wang, 2022; Zhong, 2022; Zhang et al., 2021), and social anxiety (Yao et al., 2023), the lived experiences of users encountering anxiety-inducing content remains underexplored. Furthermore,

user-centered design efforts to address this issue are lacking. Existing distressing content interventions, such as sensitive-content screens (Simister et al., 2023), may not be applicable to anxiety-inducing content due to its highly personalised and mundane nature. However, frequent exposure to such content heightens users' risk of mental health challenges, making it crucial to design more emotionally aware and supportive social media experiences.

In my PhD project, I aim to explore solutions to mitigate the impact of anxiety-inducing content on Chinese social platforms. Through a combination of empirical research and design interventions, my work seeks to empower individuals in managing their anxiety more effectively by supporting more reflective engagement with social media content.

Research questions

To better understand users' emotion response toward anxiety-inducing content, I chose to focus on users of a specific platform. Case-study platform that has been particularly prominent in this context: RedNote (Souhuyoufan, 2023). RedNote is a Chinese social media platform often referred to as "China's answer to Instagram" (Qu, 2019). It is a visually driven, lifestyle-sharing platform that integrates social media with e-commerce. Its core feature is an infinitely scrolling, gallery-organised feed, populated with user-generated content and powered by a personalised recommendation algorithm, similar to Instagrams Explore Feed. However, unlike Instagram, RedNotes post content tends to be more detailed and information-rich (Wang et al., 2023), with a stronger emphasis on content discovery rather than posts from personal connections (Gao, 2024).

Following the three stages of user-centred design, the research questions for my thesis can be separated into the following three stages:

- Requirements Gathering(RQ1): What are the experiences of Chinese Social Media users when encountering anxiety-inducing content on their feed?
- Design and Prototyping(RQ2): What design strategies can be employed to alleviate or effectively manage the anxiety experienced by Chinese Social Media users when encountering 'anxiety-inducing posts'?
- Testing and Evaluation(RQ3): What are users perceptions of the new designs effectiveness in mitigating or managing their anxiety induced by social media content?

Methodological Approach

My research adopts a combination of empirical research methods such as Surveys, Diary Studies and Interviews. These are complemented with design-led interventions e.g. technology probes, to further explore anxiety mitigation strategies. Evaluation of responses to these probes through structured engagements, further deepens the inquiry. The methodological approach is

essentially user-centred design, drawing on research through design, through the engagements with technology probes.

Work to Date

To address the research questions outlined in this study, I employ a multi-stage, mixed-method approach that combines qualitative and quantitative methods.

0.1   Phase 1: Requirements Gathering (RQ1)

To understand how Chinese Social Media users experience anxiety when encountering anxiety-inducing content in their personalised feeds, I conducted an exploratory study using a mixed-methods approach with users who self-reported frequent exposure to such content. This phase aimed to identify different themes of anxiety-inducing content, categories of anxiety triggers, users' emotional responses, and their coping strategies. The study involved:

- Survey Analysis: A large-scale survey (n=435) was conducted to classify different themes of anxiety-inducing content, category of anxiety triggers, examine users' experiences and emotional responses, and explore their interpretations of such encounters.
- Diary Studies: A subset of 25 survey participants participated in a seven-day diary study, documenting their interactions with anxiety-inducing content. They recorded details such as content themes, specific anxiety triggers, emotional reactions, and their initial intentions for engaging with the platform.
- Post-Diary Semi-Structured Interviews: Follow-up interviews provided deeper insights into participants' lived experiences, focusing on how they interpreted anxiety-inducing encounters and the strategies they used to cope with frequent exposure

0.2   Phase 1 Findings

- Themes of Anxiety-Inducing Posts: The most frequently reported anxiety-inducing content themes were "others' achievements" (70.18%, n=306), followed by "useful information" (50.46%, n=220), "potential opportunities" (45.06%, n=196), and "perfect body or appearance" (34.4%, n=150). Meanwhile, themes associated with downward assimilative social comparison were commonly reported in the "other" category.
- Analysis of 308 textual experience reports revealed three key anxiety triggers: Upward Contrastive Comparison, Downward Assimilative Comparison, Resonance on Concerned Topics.
- Engagement Despite Anxiety: Half of the 308 experience reports indicated that users did not regret seeing anxiety-inducing posts. Their reasons for engaging with such content fell into two primary themes:

- *Fight: Self-Improvement* - Using anxiety as motivation for personal growth and achievement.

- *Defense: Preparatory Coping* - Consuming anxiety-inducing content as a way to mentally prepare for potential future challenges.

- According to diary records, the primary motivation for using RedNote at the time of encountering anxiety-inducing posts was leisure and entertainment (87.34%, n=207). However, instead of serving this purpose, anxiety-inducing posts often disrupted users enjoyment. Many participants also reported that their personalised feeds delivered anxiety-inducing content at inappropriate times, preventing them from unwinding properly and, in some cases, intensifying negative emotions.

- *Internal Coping Strategies:* Many participants attempted to manage their anxiety through normalisation and rationalisation, reframing their emotional responses to lessen the impact of exposure.

- *External Coping Strategies:* Participants employed five platform-supported approaches to manipulate the algorithm and control their feed. However, these methods were often ineffective or difficult to discover, leaving users struggling to manage their exposure to anxiety-inducing content.

Findings from this phase established a foundational understanding of how RedNote users experience and respond to anxiety-inducing content in algorithmic feeds. These insights directly inform the subsequent design phase, ensuring that proposed interventions further explore users needs and behaviours.

Next Steps

0.3   Phase 2: Design and Prototyping (RQ2)

Building on insights gained, this phase focuses on designing and prototyping interventions to help Chinese Social Media users better understand and manage anxiety triggered by algorithmic content consumption. The goal is to explore how design strategies-leveraging both digital and physical mediumscan support self-awareness, reflection, and behavioural change in response to anxiety-inducing content. This phase consists of three key design explorations:

1. Exploring LLM for Anxiety Trigger Awareness
   Examining whether large language models (LLMs) can help users identify anxiety triggers in social media content. A WebApp will be developed to analyse anxiety-inducing posts and provide personalised feedback on contributing elements. This probe assesses whether AI-driven insights enhance users awareness and help them navigate anxiety-inducing content.

2. Anxiety Self-Tracking via Data Visualisation
   Leveraging the LLM's ability to detect anxiety triggers, this prototype

visualises users daily anxiety experiences, helping them recognise patterns and modify engagement habits. Visualisation techniques, including timeline-based representations and force-directed graphs, to explore self-reflection.

3. Tangible Embodied Reflection on Anxiety
Moving beyond digital interventions, this prototype physically represents anxiety accumulation through interactive objects: protruding pins symbolise rising anxiety, while a rubber drum surface represents psychological burden. By translating anxiety-inducing content consumption into a physical and sensory experience, this design aims to make users more conscious of their engagement patterns and foster a deeper sense of care for their mental well-being.

Each intervention will undergo iterative refinement through co-design workshops. Qualitative studies will evaluate how these designs influence awareness, reflection, and behaviours, informing the final evaluation phase.

0.4 Phase 3: Testing and Evaluation (RQ3)

This phase assesses the effectiveness of interventions in helping RedNote users manage algorithmically-induced anxiety. A mixed-methods approach will evaluate user perceptions, behavioural changes, and overall impact of the prototypes.

1. User Study with Think-Aloud Protocols
Participants will interact with both digital and tangible prototypes in a controlled setting, verbalising their thoughts and reactions. This method will uncover usability issues, emotional responses, and intervention effectiveness.

2. Longitudinal Deployment and Behavioural Impact Assessment
To assess the long-term effects of the interventions, a subset of participants will integrate two prototypes into their daily social media usage over a defined period, potentially two weeks. Data collection will include:

   - Usage Logs: Capturing interaction patterns to analyse engagement levels and behavioural shifts in social media consumption.
   - Self-Reports & Experience Sampling: Participants will provide periodic reflections on how the interventions influence their awareness, anxiety management strategies, and engagement behaviours.
   - Pre- and Post-Study Surveys: Measuring changes in perceived anxiety, sense of control, and emotional resilience before and after the study period.

3. Post-Study Semi-Structured Interviews
Follow-up interviews will explore the meaningfulness, benefits, and

limitations of the interventions. Participants will provide feedback to refine and optimise the prototypes.

This phase aims to generate empirical evidence on the effectiveness of different design strategies in supporting social media users anxiety management. The findings will inform future iterations of anxiety-aware design principles.

Expected Contributions

By integrating empirical research, design interventions, and user-centred evaluations, this PhD research contributes to HCI, social computing, and algorithmic experience (AX) studies. It provides a theoretical foundation, practical design strategies, and empirical evidence to support the development of more responsible, anxiety-aware social media platforms, ultimately fostering healthier interactions with algorithmic feeds in the digital age. It will advance knowledge in the following key areas:

Understanding Anxiety in Algorithmic Social Media Feeds: This research provides a systematic examination of how algorithmic feeds on social media platforms contribute to user anxiety. By identifying themes of anxiety-inducing content, key anxiety triggers, and user coping strategies, this study deepens our understanding of the emotional consequences of personalised content delivery. It highlights the paradox of engagement despite anxiety, where users knowingly consume anxiety-inducing posts for self-improvement and preparatory coping, as well as the limitations of existing feed control mechanisms that often fail to provide users with meaningful agency. These insights contribute to social computing, and algorithmic experience (AX), offering a foundation for future work on emotional well-being in digital environments.

Design Strategies for Anxiety-Aware Social Media: By developing and evaluating a set of novel design interventions, this research expands the design space for mental health-supportive social media features. The proposed interventions offer new ways to enhance user awareness, promote self-reflection, and foster behavioural change. This work contributes to affective computing, human-AI interaction, and tangible interaction design by exploring how both digital and physical modalities can support emotional regulation in algorithmic media consumption.

Biography

I am Yiwen Shang, a PhD candidate in Open Lab, in the School of Computing at Newcastle University. My research focuses on algorithmic social media feeds and their impact on user anxiety. My work bridges Human-Computer Interaction (HCI), social computing, and digital well-being, exploring design interventions to empower users in navigating anxiety-triggering content.

My PhD research consists of three phases: (1) an empirical investigation into how RedNote users experience anxiety from algorithmically recommended content, (2) the design and prototyping of interventions that support anxiety awareness and self-regulation, including LLM-powered feedback, anxiety self-tracking visualisation, and tangible reflection tools, and (3) evaluating these interventions through user studies and longitudinal deployment. My work contributes to algorithmic experience (AX), affective computing, and mental health-aware design in social media platforms.

Prior to my PhD, I earned a masters degree in software engineering from University College London and studied human-computer interaction at Newcastle University, where I developed an interest in the intersection of technology, mental health, and user experience. Through the ECSCW 2024 Doctoral Colloquium, I look forward to receiving feedback on my research findings, design decisions, and ethical considerations, as well as engaging with scholars who share an interest in algorithmic transparency, digital well-being, and user autonomy in social computing.

What I hope to gain from attending the ECSCW 2024 Doctoral Colloquium

0.5 Expert Feedback on My Research Findings and Design Decisions

I seek insights from senior researchers and fellow PhD students on my research findings, particularly regarding users continued engagement with anxiety-inducing content and their tendency to normalise and rationalise anxiety. I hypothesise that this behaviour is influenced by East Asian cultural values, where self-improvement and resilience shape social media consumption habits. My design approach aligns with these values by moderating exposure rather than eliminating anxiety-inducing content, aiming to enhance mental health awareness while preventing excessive triggering.

However, I am ethically concerned about whether this is the right design decision. While this intervention subtly modifies user behaviour, it still allows users to remain in a cycle of anxiety, albeit at a regulated level. I would like to discuss whether a more radical design approach, which actively critiques and discourages this pattern of information consumption, would better serve users' well-being. What would be the potential drawbacks of such an approach?

0.6 Ethical Considerations in My Research Approach

As I design the tech probe study, I am particularly concerned about the ethical implications of processing non-participant user-generated content using LLMs without explicit consent. While users do not actively agree to have their posts analysed in this way, similar tools, such as screen readers, are already widely used

to capture and process social media content. This raises a critical ethical question: To what extent should researchers leverage AI tools to process publicly available social media data?

I hope to receive guidance from scholars experienced in AI ethics, LLM applications, and social computing research to navigate these concerns. I want to ensure that my methodology balances innovation with ethical responsibility, particularly in contexts where user privacy and content ownership intersect with emerging AI capabilities.

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