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Platform architecture is associated with the form and breadth of public engagement: algorithmic feed dependency in Chinese social media

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Background: Reliance on algorithmically curated feeds may relate to engagement with public issues beyond general use intensity, but whether this association varies across platforms and issue contexts remains unclear.
Methods: We analyzed 718 attention-check-valid responses from Chinese university students and recent graduates recruited online, including 508 users active on both Douyin and Xiaohongshu. Methods included OLS regression, paired comparisons with Holm correction, participant-clustered interaction models, repeated-measures measurement invariance tests, and item-exclusion sensitivity analyses.
Results: On both platforms, feed reliance was positively associated with educational issue engagement (Douyin: b = 0.136, $p < 0.001$; Xiaohongshu: b = 0.145, $p = 0.001$). Among four item pairs, only sharing/forwarding differed significantly after Holm correction (adjusted $p = 0.009$; liking/commenting: adjusted $p = 0.062$). Educational slopes did not differ significantly across platforms, though equivalence was inconclusive. Adjusted interaction tests showed steeper Xiaohongshu slopes for marriage/childbearing and social pressure issues. The educational-issue association persisted after excluding the continuous-scrolling item.
Conclusion: Findings reveal platform- and topic-specific correlations and offer preliminary evidence distinguishing perceived feed reliance from general use intensity. However, cross-sectional self-reports cannot establish platform architecture as the cause, and slope equivalence remains unestablished.

KEYWORDS
algorithmic feed, Douyin, issue engagement, media system dependency, platform architecture, Xiaohongshu

1 Introduction

Algorithmically curated feeds have become a primary channel through which young people engage with and participate in public issues. In today's platform ecosystem, the visibility of issues, the content pushed to users, and trending topics are largely determined by recommendation systems rather than by users' active searches or choices (Bucher, 2018; Gillespie, 2014; Napoli, 2014). This phenomenon is particularly pronounced among college students and recent graduates in China; for them, Douyin and Xiaohongshu have evolved from

entertainment platforms into important sources of information on education, employment, and social issues.

Existing research on social media and issue engagement primarily relies on generic measures, namely usage duration and frequency (Boulianne, 2015; Theocharis, 2015). However, these measures cannot distinguish between users who actively seek out information and those who encounter public issues through algorithmically curated feeds. This distinction is theoretically significant: users who proactively search for information and those who depend on algorithmic recommendations may exhibit different behavioral patterns, leading to variations in their attentional structures, issue awareness, and engagement outcomes (Rader and Gray, 2015; Zarouali et al., 2022). Therefore, metrics such as usage duration and frequency are insufficient to reflect how public issue engagement arises in an algorithmically driven platform environment.

This study shifts the focus from general use intensity to perceived feed reliance, examining users' reported reliance on algorithmically curated feeds. Conceptually, algorithmic feed dependency refers to users' tendency to primarily access and follow information through recommended feeds rather than active searches. However, our three-item measure also captures continuous scrolling and perceived recommendation fit. It is therefore an imperfect proxy for this concept, not a pure indicator of reliance on feeds over active information seeking.

Within China's platform media ecosystem, this theoretical distinction is particularly significant. Douyin centers on an immersive short-video feed, its full-screen autoplay and continuous vertical scrolling lower the barriers to content browsing and immediate interaction (Chen et al., 2021; Karizat et al., 2021). In contrast, Xiaohongshu combines algorithmic recommendations with content creation, topic following, search, bookmarking, and community discussions, allowing users to both access platform-recommended content and engage in more purposeful information searches and topic-based interactions. Although both platforms rely heavily on algorithmic recommendations, they exhibit significant differences in content pacing, interface design logic, and support for user engagement (Nieborg and Poell, 2018; van Dijck et al., 2018). These structural differences raise a question that has not yet been fully explored: whether and how content that relies on algorithmic recommendations is associated with public issue engagement in similar or different ways across different platform contexts.

Our empirical focus is on Chinese university students and recent graduates, specifically the extent of their engagement with educational issues. Such issues are particularly salient for this group because they are closely linked to academic pressure, employment prospects, resource allocation, social mobility, and perceptions of fairness. These issues are not only embedded in the daily experiences of young people, but also carry significant implications at the broader societal level (Bennett and Segerberg, 2012; Literat and Kligler-Vilenchik, 2021). Therefore, educational issues provide an ideal empirical context for exploring the relationship between perceived feed reliance and public issue engagement.

The term "social pressure" as used here refers to a range of issues, including economic stress, employment insecurity, housing affordability, and rising living costs, rather than a measure of clinical stress or burnout. Even though these experiences stem from individual circumstances, they can still be discussed at the societal level. Tanhan and Çam (2011) provided contextual evidence on psychosocial pressures in educational workplaces through the association between teachers' exposure to mobbing and burnout; their study did not focus on algorithmic feeds, related platforms, or the sample population of this survey.

Through a comparative analysis of Douyin and Xiaohongshu, this study makes three contributions. At the theoretical level, this study explores whether media system dependency can be extended to perceived reliance on recommendation systems. At the empirical level, the study utilized a non-probability sample to document associations between user engagement and specific platforms and topics. At the methodological level, the study evaluated a preliminary feed-reliance measure alongside general use intensity and tested the stability of results after excluding a scrolling-duration item. Platform architecture is treated as an explanatory framework, rather than a directly measured or experimentally manipulated explanatory variable.

2 Literature review and hypotheses

2.1 Media system dependency theory and its extension to algorithmic platform environments

Media System Dependency (MSD) theory, originally proposed by Ball-Rokeach and DeFleur (1976), serves as a foundational framework for examining audience–media relationships and has been systematically developed in subsequent scholarship (DeFleur and Ball-Rokeach, 1989). Its core proposition holds that when individuals rely on specific media to fulfill goals such as understanding, orientation, or entertainment, that media's influence on their cognitions, attitudes, and behaviors is heightened. In traditional media environments, this dependency relationship was primarily conceptualized in terms of audience interactions with institutional outlets, including television broadcasters and newspapers, and was modulated by two conditions: societal uncertainty and individual information needs. Recent scholarship has extended the MSD framework to address emotional activation and platform-specific dependency structures as additional determinants of media effects (Omori et al., 2026).

The classical MSD framework, however, rests on an assumption increasingly strained in algorithmic environments: that audiences actively select among available media channels to satisfy their information needs. Traditional dependency was institutional in nature, arising from voluntary, channel-level choices such as watching a broadcast network or reading a newspaper (Ball-Rokeach and DeFleur, 1976). In algorithmically governed platforms, this assumption breaks down in at least two ways. First, content visibility is no longer determined by users' deliberate selection but by recommendation systems that rank, filter, and surface content based on inferred behavioral profiles (Bucher, 2018; Gillespie, 2014). Second, the object of dependency has shifted. Whereas media system dependency (MSD) theory located dependency in the audience–institution relationship, its contemporary counterpart is a perceived reliance on opaque algorithmic curation systems, a relationship that is less visible, less voluntary, and more deeply embedded in everyday platform use (Klinger and Svensson, 2018; Schaetz, 2023). Extending MSD theory to algorithmic environments therefore requires reconceptualizing the locus of dependency from institutional-reliance to system-reliance, where the "system" encompasses both the recommendation algorithm and the platform architecture shaping how content is surfaced and consumed.

Some scholars characterize this transition as a structural displacement of "media logic" by "algorithmic logic" (Klinger and Svensson,

2018). Notably, users often possess naive folk theories regarding the operation of algorithms, and these subjective understandings subsequently shape both their interactions with platforms and the extent of dependency they develop (Ytre-Arne and Moe, 2021).

Algorithmic feed dependency captures the extent to which individuals rely on recommendation systems to fulfill information needs in platformized news consumption (Lim and Kim, 2024; Schaetz, 2023). Such dependency is reinforced through sustained platform engagement, which may progressively diminish users' motivation to seek information beyond social media environments, narrowing their information repertoires and reducing active information-seeking behavior (Beam, 2014; Pariser, 2011). Importantly, users' perceptions of algorithmic operations influence not only their information-seeking behaviors but also, through personalization mechanisms, their self-perception and identity construction (Lee et al., 2022). These folk theories are consequential for the present study: users who perceive themselves as well-served by algorithmic recommendations may develop stronger feed dependency, which in turn shapes the extent to which they encounter and engage with issue-relevant content (Ytre-Arne and Moe, 2021). This mechanism provides a cognitive microfoundation for the macro-level dependency–engagement association examined below.

Research on algorithmic feed dependency, however, has notable limitations. Scholarship on media habits has established that habitual use and dependency, while conceptually overlapping, are fundamentally distinct: habits refer to automated, repetitive behavioral patterns, whereas dependency reflects goal-directed information gratification needs (LaRose, 2010). Most studies in this area have concentrated on news consumption, leaving public issue engagement comparatively underexplored. Furthermore, existing work frequently conflates algorithmic dependency with general social media use intensity, treating "dependency" and "habitual use" as interchangeable constructs and thereby obscuring meaningful conceptual distinctions at the measurement level.

Building on this, the present study defines algorithmic feed dependency as perceived reliance on recommended feeds rather than active search. Habitual use concerns automatic repetition, whereas general use intensity concerns time or frequency. These distinctions are conceptual: the administered three-item scale includes a continuous-scrolling item that overlaps with intensity and habit, and a recommendation-fit item that may overlap with platform preference. Accordingly, the scale is a preliminary proxy whose content validity and discriminant validity require further assessment; the two-item sensitivity analysis examines whether the core findings depend on the scrolling item.

2.2 Social media use and public issue engagement: from use frequency to algorithmic feed dependency

The relationship between social media use and public issue engagement has constituted a central concern in communication research. Meta-analytic evidence reveals a generally positive correlation between social media use and civic and political participation, with over 80% of reported correlations indicating a positive direction (Boulianne, 2015). Yet causal mechanisms remain ambiguous and effect sizes vary by participation type: social media appears to exert a weaker influence on electoral mobilization while demonstrating stronger associations with general civic participation behaviors (Boulianne, 2015). More recent meta-analytic work confirms that the engagement-promoting effects of social media are strongest for low-threshold behaviors and expressive forms of participation (Boulianne and Hoffmann, 2024).

Existing research has relied predominantly on generic measures such as usage duration and frequency, an approach that inadequately captures variation in interaction patterns (Rader and Gray, 2015). Users who spend equivalent time on a platform may differ substantially in information access methods: some actively search for specific issues, while others primarily rely on algorithmically recommended content. These two groups differ in issue exposure breadth, source diversity, and the mechanisms triggering participatory behaviors (Zarouali et al., 2022). Algorithmic curation may further produce reinforcing spirals in which prior engagement shapes subsequent content exposure, thereby increasing the likelihood of further engagement (Slater, 2007). Yet much of the literature has relied on frequency- and duration-based measures that cannot distinguish between users who actively seek out issue-relevant content and those who encounter it incidentally through algorithmically curated feeds (Boulianne, 2015). This measurement limitation means that engagement effects attributed to social media use may be driven by qualitatively different information-access pathways, a distinction with important theoretical and practical implications.

Empirical evidence indicates that algorithmic content selection exerts an independent effect on users' news engagement behaviors, one not fully accounted for by general use intensity (Dujeancourt and Garz, 2023; Lim and Kim, 2024). Shifting the measurement focus from general use intensity to algorithmic feed dependency thus motivates examination of a distinct information-access pathway alongside general use intensity. Algorithmically curated civic content is positively associated with incidental exposure to political information, which in turn predicts political participation, associations that generic use-frequency measures fail to capture (Boulianne and Hoffmann, 2024).

In the Chinese social media environment, algorithmic recommendation systems have transformed how young users access information. Users are more likely to encounter public issues through passive browsing of recommended content than through active search (Rader and Gray, 2015; Ytre-Arne and Moe, 2021). Algorithmic feed dependency thus represents both a pattern of platform use and a structural form of issue exposure, shaping which public issues enter users' informational horizons and potentially triggering subsequent behaviors, including liking, commenting, sharing, and sustained engagement. The personalization logic underpinning these systems progressively aligns content delivery with users' inferred interests, yielding stable but potentially self-reinforcing informational environments (Beam, 2014; Pariser, 2011). This is particularly relevant for young people, whose engagement with public issues is increasingly shaped by the social and civic contexts of their everyday platform use (Bennett and Segerberg, 2012; Literat and Kligler-Vilenchik, 2021).

2.3 Platform architecture and user engagement: a comparative perspective on Douyin and Xiaohongshu

Platform architecture refers to the structural constraints and incentive mechanisms that platforms impose on user behavior through interface design, algorithmic logic, and functional configuration (Nieborg and Poell, 2018; van Dijck et al., 2018). Variations in platform architecture shape the forms, frequency, and depth of user engagement, and differences in platform affordances systematically alter patterns of political and civic participation (Theocharis et al.,

2023). This framework provides an analytical foundation for examining how Douyin and Xiaohongshu differ in facilitating public issue engagement.

Douyin is structured around a full-screen, immersive short-video feed as its core architecture. Its continuous vertical-swipe interaction design minimizes interruptions and the need for active selection (Chen et al., 2021; Karizat et al., 2021), lowering the threshold for immediate interaction without requiring users to exit the main feed. The full-screen autoplay mechanism reduces cognitive load, promoting passive consumption and facilitating immediate behavioral responses (Karizat et al., 2021). This interest-driven recommendation logic has progressively transformed Douyin's user base from traditional social network ties into interest-based clusters, further amplifying the structural influence of algorithms on issue visibility (Gerbaudo, 2026). Empirical studies on TikTok and Douyin confirm that this autoplay-and-scroll architecture is particularly effective at sustaining passive engagement and stimulating affective responses to issue-related content (Kaye et al., 2021). Yet this architecture carries structural tensions: algorithmically optimized short-video platforms do not necessarily democratize content production but may instead reinforce a broadcasting logic in which a small group of super-users monopolizes popular content and visibility, widening the participation gap between creators and passive consumers (Pilati et al., 2025). This evidence suggests that while short-video feed design may lower the threshold for reactive engagement, including liking and sharing, its underlying algorithmic logic may concentrate expressive participation among a narrow group of highly active users, a distinction directly relevant to the present study's four-dimensional measure of engagement.

Xiaohongshu, by contrast, centers on illustrated notes and short videos, employing a hybrid architecture that integrates algorithmic recommendation with community features, including topic hashtags, following, search, bookmarking, and comment-based interaction (Nieborg and Poell, 2018). This design delivers curated content while enabling purposeful exploration and deeper engagement through topic tracking, note bookmarking, and comment interactions. Public issue engagement on Xiaohongshu thus extends beyond immediate responses to encompass ongoing discussions, experience sharing, and community-organized collective memory. Its topic-hashtag mechanisms and note-threading affordances support relatively persistent discussion communities around specific social issues, enabling more durable forms of issue engagement (Zhai, 2025).

Drawing on affordance theory (Evans et al., 2017), we consider two possible interpretations of platform differences. Douyin's immersive feed may reduce the effort required for immediate reactions, whereas Xiaohongshu's combination of recommendation, topic navigation, search, and discussion may support continued engagement around varied issues. These proposed mechanisms motivate the comparison, but interface features, switching costs, and longitudinal issue persistence were not directly measured. They therefore remain hypotheses for future behavioral or experimental research.

Three gaps motivate this comparison: limited separation of perceived feed reliance from general use intensity, limited cross-platform assessment of measurement comparability, and limited evidence on issue-specific associations in Chinese university recruitment networks. We compare Douyin and Xiaohongshu while distinguishing paired mean differences from differences in dependency–engagement slopes. Figure 1 presents de-identified illustrative screenshots of interface features for context; it is not evidence of platform effects.

2.4 Research hypotheses

Drawing on the preceding literature review and theoretical analysis, this study advances the following hypotheses:

> *H1*: On both Douyin and Xiaohongshu, algorithmic feed dependency is positively associated with educational issue engagement, above and beyond the effects of general platform use intensity and baseline issue interest.
>
> *H2a*: Mean educational issue engagement differs between platform versions, with differences expected primarily in low-threshold reactive behaviors, namely liking/commenting and sharing/forwarding, rather than emotional expression or reinforcement-related responses.
>
> RQ1: Given that platform architectures differ in interface design and content pacing, does platform type moderate the strength of the dependency–engagement association? H2a and RQ1 address distinct questions: H2a concerns between-platform differences in mean engagement levels, namely a main effect, while RQ1 concerns whether the dependency–engagement slope differs across platforms, that is, an interaction effect. As existing evidence does not provide a clear directional prediction for slope differences, this is framed as an exploratory research question rather than a directional hypothesis.
>
> *H3*: The positive association between algorithmic feed dependency and issue engagement generalizes across education, marriage/childbearing, and social pressure issues more consistently on Xiaohongshu than on Douyin. Platform differences in association strength are assessed through direct interaction tests, rather than inferred from significance in separate models. Figure 2 presents the theoretical framework.

3 Methods

3.1 Sample and data collection

This study recruited respondents through networks targeting Chinese university students and recent graduates. Educational issues, including academic and employment uncertainty, resource allocation, and social mobility, are relevant to this recruitment population. The questionnaire recorded educational level but did not separately record current-student versus recent-graduate status, so subgroup membership and its distribution cannot be verified from the supplied survey export.

Data were collected through an online survey distributed via WeChat using purposive snowball recruitment. Initial respondents in student networks were invited to share the survey within their networks. Of 739 collected questionnaires, 21 did not select the instructed response ("Agree") on the attention-check item, leaving 718 valid responses. Of these respondents, 660 reported using Douyin and 548 reported using Xiaohongshu in the preceding three months; 508 reported using both. Thus, 152 used only Douyin, 40 used only Xiaohongshu, and 18 used neither platform. Platform-specific skipped item blocks were treated as structurally missing, not as zero scores.

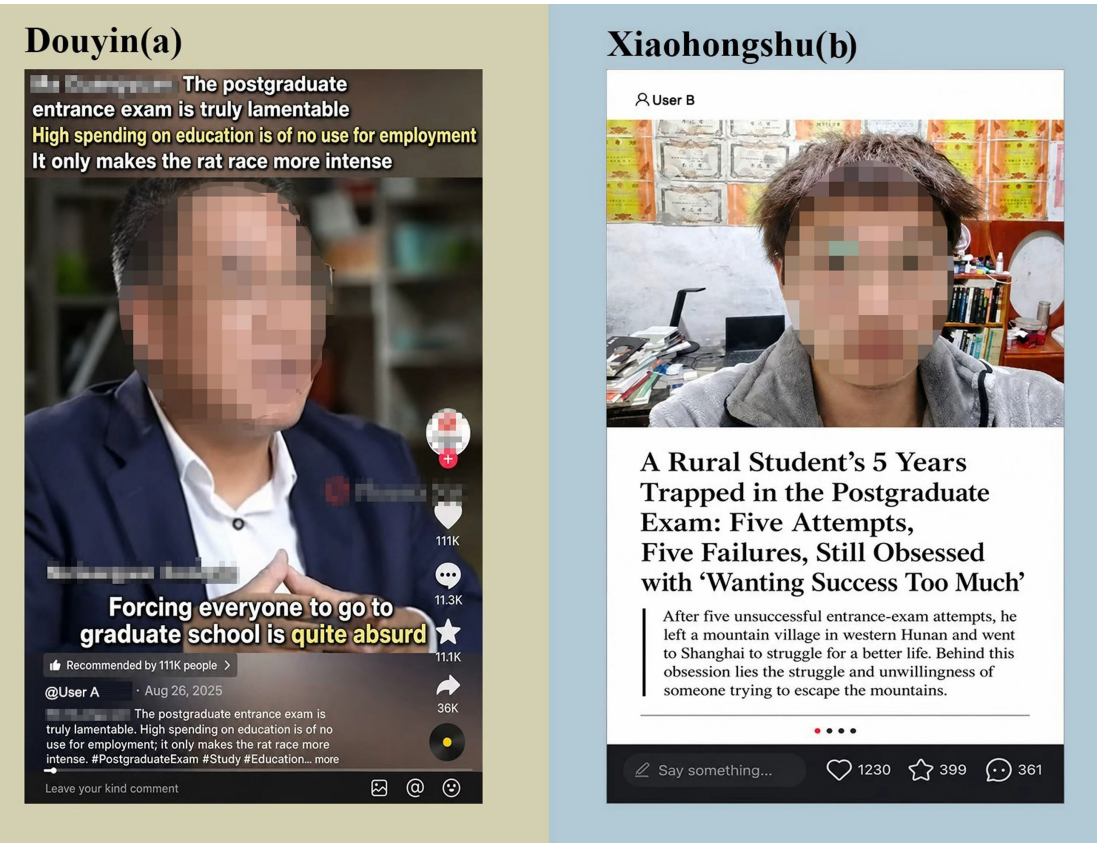


FIGURE 1
De-identified illustrative screenshots of Douyin (panel a, left) and Xiaohongshu (panel b, right) posts on postgraduate entrance exam topics. Panel a shows a short video (@User A, Aug 26, 2025; 111K likes, 11.3K comments, 11.1K favorites, 36K shares) with overlaid text lamenting the exam; panel b shows a graphic-text note by User B on a rural student's repeated exam attempts (1,230 likes, 399 favorites, 361 comments). Faces are pixelated and usernames pseudonymized. The screenshots illustrate platform-specific interfaces and interaction features and are provided for context only; they do not constitute evidence of platform effects. Reproduced with permission.

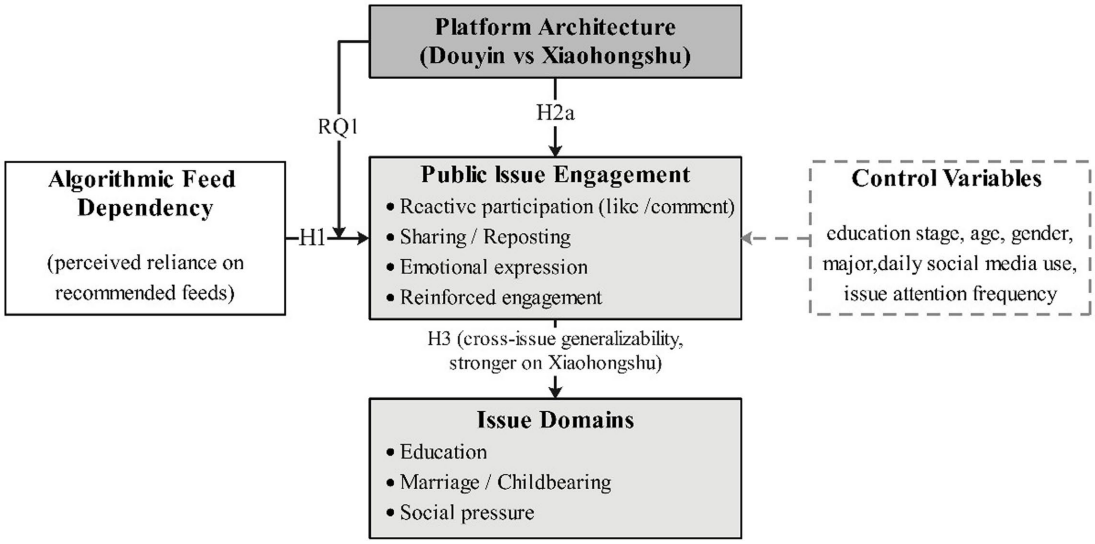


FIGURE 2
Theoretical framework. Platform architecture (Douyin vs Xiaohongshu) is hypothesized to directly shape public issue engagement (H2a) and to moderate the link between algorithmic feed dependency and engagement (RQ1). Algorithmic feed dependency (perceived reliance on recommended feeds) is expected to predict four engagement forms (H1): reactive participation (like/comment), sharing/reposting, emotional expression, and reinforced engagement. Control variables (dashed box): education stage, age, gender, major, daily social media use, and issue attention frequency. H3 addresses cross-issue generalizability (expected stronger on Xiaohongshu) across issue domains: education, marriage/childbearing, and social pressure.

Respondents were located across 30 provincial-level regions according to the survey export. The five largest groups were Shandong, Henan, Hebei, Jiangsu, and Guangdong, together comprising 408 respondents (56.8%); the remaining 310 (43.2%) were distributed across 25 other regions. Appendix Table A1 describes these five groups, and Table A3 reports the composition of the full valid sample. Regional spread does not make this network-based sample representative. Dual-platform users comprised 70.8% of valid respondents, allowing paired comparisons that control for stable person-level differences but not all platform-specific confounding.

WeChat-based recruitment can introduce network homophily and dependence among socially connected respondents. Shared exposure or issue interest may affect both feed reliance and engagement, and adjusting for issue attention could produce either under-control or over-control. Bias may therefore operate in either direction; the estimates cannot be assumed conservative. Respondent-clustered errors account for repeated platform records, but they do not address recruitment-chain clustering because referral-chain identifiers were not collected.

3.2 Measures

All core variables were measured using five-point Likert scales, ranging from 1 to 5. In this scale, a score of 1 indicates "strongly disagree" or "never," while a score of 5 indicates "strongly agree" or "very frequently."

Algorithmic feed dependency was measured separately for Douyin and Xiaohongshu using the three items actually administered: (1) "I primarily obtain content through [platform's] recommended feed rather than by actively searching"; (2) "I often spend a long time continuously scrolling through [platform's] recommended content before stopping"; and (3) "[Platform's] recommendations satisfy my content preferences better than searching for content myself." Scores are the arithmetic mean of the three items. The second item concerns sustained scrolling and overlaps with intensity or habit; it is not a statement about information-need satisfaction. Items 1 and 3 are more directly related to access pathway and recommendation fit. We retain the administered composite for continuity and separately analyze the mean of items 1 and 3.

The item set was used to operationalize the theoretical contrast between reliance on recommendations and active search, informed by work on algorithm dependency and algorithmic content perception (Schaetz, 2023; Zarouali et al., 2021). It was not an unchanged adoption of a validated dependency scale. The supplied study materials contain no documented expert content-validity assessment, cognitive interviews, or pilot validation; such procedures are not claimed retrospectively. Independent validated measures of habitual use, platform preference, and algorithm awareness were not administered, limiting assessment of convergent and discriminant validity.

This scale measures perceptions rather than observed browsing or behavioral dependency. Its association with engagement does not establish a distinct behavioral dependency construct. Correlations with the survey's general daily-use item were r = 0.386 for Douyin and r = 0.273 for Xiaohongshu; these descriptive correlations and covariate adjustment do not substitute for comparison with validated neighboring constructs. Future work should combine expert review and cognitive interviewing with validated habit and preference scales and platform-log measures.

Engagement was measured using the same four items for each platform and each of three issue domains: liking/commenting, sharing/forwarding, emotional expression, and reinforcement-related participation. Domain prompts referred to education (academic advancement and employment anxiety, educational equity, and resource allocation), marriage/childbearing (relationships, marriage costs, childbearing burdens, and parenting pressure), or social pressure (financial stress, unemployment risk, housing costs, and rising living costs). Each domain score is the mean of its four responses. The fourth item reads: "Seeing a large amount of content aligned with my own viewpoint makes me more confident in my judgment or more willing to participate in discussions." It combines epistemic confidence with participation willingness; neither its individual score nor the composite isolates sustained behavioral participation.

Internal consistency was acceptable across domains: Douyin $\alpha = 0.830$ (education), 0.854 (marriage/childbearing), and 0.855 (social pressure); Xiaohongshu $\alpha = 0.869$, 0.874, and 0.874, respectively. Additional-domain factor loadings, CR, AVE, and fit are reported in Table A5. These checks address internal structure, rather than the double-barreled item's content validity.

Control variables were included in all regression models, specifically educational level, age group, gender, academic discipline, daily social media use, and public issue attention frequency during the preceding three months. Reanalysis used undergraduate = 0 and master's/doctoral = 1; male = 0 and female = 1; age groups coded 1–4 in ascending order; and daily-use and issue-attention categories coded 1–5. For comparability, the base specification used discipline codes in questionnaire order (humanities, science/engineering, economics/management, medicine, education, arts, other); because this nominal category has no natural order, a separate six-dummy specification with humanities as reference was checked. Age and use-duration coefficients concern ordinal categories, not exact years or hours.

3.3 Validity and reliability of measures

Control variables were selected based on prior research on social media and civic engagement (Boulianne, 2015; Theocharis et al., 2023). We included demographic characteristics (age, gender, educational level, and academic discipline), which may influence both platform use and issue salience. We also controlled for daily usage duration and issue attention frequency to account for engagement intensity separate from feed dependency. We did not include political interest or media literacy as controls because validated single-item measures for these constructs in the Chinese university context were unavailable in our survey instrument; this limitation is acknowledged in Section 5.3.

Normal-theory maximum-likelihood CFA was repeated using the three administered dependency items and four educational-engagement items as two correlated factors. In the Douyin sample (N = 660), standardized dependency loadings were 0.785, 0.815, and 0.877, and engagement loadings were 0.795, 0.674, 0.743, and 0.761. Dependency CR = 0.866 and AVE = 0.683; engagement CR = 0.832 and AVE = 0.554. Individual dependency loadings are reported in Appendix Table A4, with domain-specific measurement results in Table A5.

In the Xiaohongshu sample ($N = 548$), standardized dependency loadings were 0.785, 0.844, and 0.850, and educational-engagement loadings were 0.865, 0.758, 0.751, and 0.788. Dependency CR = 0.866 and AVE = 0.684; engagement CR = 0.870 and AVE = 0.627. Cronbach's alpha for dependency was 0.865 on Douyin and 0.866 on Xiaohongshu; for educational engagement it was 0.830 and 0.869, respectively.

For educational issues, the squared latent dependency–engagement correlation was 0.076 on Douyin and 0.041 on Xiaohongshu, below both constructs' AVE in each model (Fornell and Larcker, 1981). Model fit was χ^2 (13) = 10.03, p = 0.691, CFI = 1.000,

RMSEA = 0.000, SRMR = 0.015 for Douyin, and χ^2 (13) = 28.06, p = 0.009, CFI = 0.992, RMSEA = 0.046, SRMR = 0.031 for Xiaohongshu. Fit indices were interpreted against conventional cutoffs (Hu and Bentler, 1999). Five-point items were treated as approximately continuous for these ML fits; ordinal threshold invariance and robust categorical-estimator replication remain future checks.

Within-platform factor separation does not itself establish cross-platform comparability. We therefore fit repeated-measures CFA models to the 508 dual-platform respondents in wide format, with separate dependency and engagement factors for each platform, freely correlated latent factors, and correlated residuals for matching items across platforms. Configural models shared the loading pattern, metric models constrained corresponding loadings, and scalar models also constrained intercepts while allowing Xiaohongshu latent means to differ. Educational model fit was χ^2 (64) = 71.52, CFI = 0.998, RMSEA = 0.015, SRMR = 0.026 at configural level; χ^2 (69) = 79.71, CFI = 0.997, RMSEA = 0.017, SRMR = 0.030 at metric level; and χ^2 (74) = 92.50, CFI = 0.995, RMSEA = 0.022, SRMR = 0.030 at scalar level. The CFI decreases (0.001 and 0.002) and RMSEA increases (0.002 and 0.005) were small relative to conventional guidance (Chen, 2007). Analogous models supported metric and scalar comparability for the additional domains (Table A6). This is conditional evidence within the continuous-item model, not validation of every aspect of the constructs.

3.4 Analytic strategy

Common-method concerns were assessed descriptively. In the complete dual-platform sample, the first principal component of the 30 standardized scale items accounted for 26.4% of variance. A component below 50% cannot establish the absence of method bias; this Harman-type diagnostic is insensitive to several forms of shared-method variance (Podsakoff et al., 2003). Predictors and outcomes were collected in the same questionnaire, so common-method variance may inflate their association despite satisfactory factor separation.

We estimated platform-specific OLS models for interpretability of the four-item engagement means. Respondent-clustered errors were used for pooled dual-platform models, and HC3 heteroscedasticity-robust errors were added for platform-specific models. Diagnostics included residual-versus-fitted inspection, a Ramsey RESET test adding the squared fitted value, a Breusch–Pagan test, variance inflation factors, and Cook's distance. Educational models also were estimated as ordered logits over the 17 observed composite-score categories. OLS was retained for ease of interpretation, consistent with simulation evidence that OLS and ordered models yield substantively comparable results when ordered outcomes contain five or more categories (Norman, 2010). All added checks are reported as analyses of the existing data; they were not preregistered.

Paired comparisons used the 508 dual-platform users. The composite educational mean comparison was retained as a single manuscript-defined summary contrast, without claiming preregistration. The four educational item tests were treated as one exploratory family and adjusted using Holm's step-down procedure. Both raw and adjusted p-values are reported; inference about specific behaviors uses the adjusted values. Item comparisons concern observed responses, whereas scalar factor invariance supports comparisons of the broader latent construct.

The dual-platform data were restructured into 1,016 records with a participant identifier. Pooled OLS models included platform (Douyin = 0, Xiaohongshu = 1), dependency, their interaction, and the six covariates, with standard errors clustered across the two records belonging to each of 508 respondents. A positive interaction denotes a steeper dependency–engagement slope on Xiaohongshu. For educational issues, a TOST sensitivity assessment used equivalence bounds of ±0.10; these bounds were chosen analytically and were not preregistered.

The same framework was applied to marriage/childbearing and social pressure engagement. Holm corrections were applied separately to the six platform-by-domain dependency coefficients and the three paired-sample platform interactions. We also repeated regressions after excluding dependency item 2 and, separately, engagement item 4. These analyses evaluate robustness to the identified measurement problems without retroactively changing administered items. The available sample does not justify interpreting a non-significant interaction as proof of no moderation.

4 Results

4.1 Algorithmic feed dependency and educational issue engagement

In the Douyin subsample, the three-item dependency composite was positively associated with educational engagement, b = 0.136, SE = 0.040, $p < 0.001$, 95% CI [0.058, 0.214]. The HC3 p-value was 0.002. This association was conditional on the six coded covariates and should not be interpreted as a causal effect.

The Xiaohongshu estimate was b = 0.145, SE = 0.044, p = 0.001, 95% CI [0.058, 0.232]; HC3 p = 0.001. Table 1 reports the recalculated base models with the coding specified in Methods.

Issue attention was also positively associated with educational engagement (Douyin: b = 0.204, $p < 0.001$; Xiaohongshu: b = 0.228, $p < 0.001$). Model R^2 values were 0.109 and 0.086. These models leave most engagement variance unexplained; non-significant demographic main effects do not establish homogeneous dependency slopes across demographic groups.

These results supported H1 within the present sample: educational associations remained significant after Holm correction across the six platform-by-domain coefficients (adjusted p = 0.003 on both platforms). Excluding the scrolling item retained the association (Douyin: b = 0.117, SE = 0.038, p = 0.002; Xiaohongshu: b = 0.129, SE = 0.043, p = 0.003; Table A7). Excluding the double-barreled engagement item likewise retained educational associations. Province fixed effects (Table A2), categorical discipline controls, HC3 errors, and ordered logits did not overturn H1. Educational-model RESET p-values were 0.166 and 0.592; VIF maxima were 1.74 and 1.83. Heteroscedasticity was detected on Douyin (Breusch–Pagan p = 0.024), supporting the HC3 check. Cook's distance maxima were 0.017 and 0.013; sensitivity exclusions of observations above 4/N retained positive educational associations (Table A8).

4.2 Comparing engagement levels across platforms

Among dual-platform users, composite educational engagement was higher on Douyin (M = 3.266, SD = 0.991) than Xiaohongshu (M = 3.151, SD = 1.065): mean difference = 0.116, 95% CI [0.012, 0.219], t (507) = 2.196, p = 0.029. The paired standardized difference,

TABLE 1 OLS regression models of educational issue engagement on Douyin and Xiaohongshu.

Variable	b (Douyin)	SE (Douyin)	b (XHS)	SE (XHS)
Algorithmic feed dependency	0.136***	(0.040)	0.145**	(0.044)
Education stage	0.008	(0.123)	0.046	(0.142)
Age group	−0.070	(0.059)	0.017	(0.070)
Gender	−0.054	(0.075)	0.070	(0.095)
Academic major	0.028	(0.021)	0.004	(0.025)
Daily social media use	0.033	(0.035)	−0.005	(0.041)
Issue attention frequency	0.204***	(0.036)	0.228***	(0.041)
Constant	1.966***	(0.198)	1.720***	(0.252)
N	660		548	
R^2	0.109		0.086	
Adjusted R^2	0.099		0.074	

Unstandardized OLS coefficients and conventional standard errors are reported; HC3 checks are summarized in the text and Table A8. XHS = Xiaohongshu. Control coding is specified in Measures; categorical discipline controls are a sensitivity check. Stars indicate raw p-values: *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$. Educational dependency coefficients remain significant after Holm correction across six platform-by-domain tests (adjusted $p = 0.003$ on each platform).

TABLE 2 Paired-samples comparison of educational issue engagement on Douyin and Xiaohongshu ($N = 508$).

Platform	M	SD	*N*	95% CI	t(507)	*p*
Douyin	3.266	0.991	508			
Xiaohongshu	3.151	1.065	508			
Mean difference	0.116			[0.012, 0.219]	2.196	0.029

Dual-platform users ($N = 508$); two-tailed paired test. A positive difference indicates a higher Douyin score. This composite contrast is reported separately from the four-item exploratory testing family. The within-person standardized difference is dz = 0.097.

using the standard deviation of within-person differences, was dz. = 0.097 (Cohen, 1988). This is a small observed mean difference, not an estimate of an architectural effect (Table 2).

After Holm correction across four item tests, sharing/forwarding remained higher on Douyin (raw $p = 0.002$, adjusted $p = 0.009$). Liking/commenting did not remain significant (raw $p = 0.021$, adjusted $p = 0.062$). Emotional expression (adjusted $p = 0.628$) and the reinforcement-related response (adjusted $p = 0.452$) also showed no statistically significant difference. Table 3 and Figure 3 distinguish raw from adjusted inference.

H2a received partial support: the composite contrast and sharing/forwarding comparison were consistent with the prediction, but the corrected results did not support a difference for liking/commenting. The evidence therefore does not establish a general platform difference across all low-threshold reactive behaviors, or equality for the other behaviors.

4.3 Platform as a moderator of the dependency–engagement association

We then examined whether platform type moderated the association between algorithmic feed dependency and educational issue engagement. The dual-platform data were restructured into a long format, yielding 1,016 platform-by-user observations. A pooled OLS model with clustered standard errors was estimated, including platform type, algorithmic feed dependency, and their interaction term.

In the pooled educational model, dependency was positively associated with engagement, while the platform × dependency interaction was b = 0.003, SE = 0.060, raw $p = 0.955$, 95% CI [−0.115, 0.122] (Table A9). The test did not detect a slope difference. Its confidence interval permits differences in either direction, so non-significance should not be read as slope equality.

With equivalence bounds of ±0.10, the recalculated 90% interval was [−0.096, 0.103] and TOST $p = 0.055$, using participant-clustered errors and 507 degrees of freedom. The upper endpoint lay outside the equivalence region, so equivalence was not established at $\alpha = 0.05$. The earlier manuscript had mislabeled the 95% interval as a 90% interval. For RQ1, the appropriate conclusion is that neither a statistically significant educational slope difference nor formal equivalence was established; the point estimate alone cannot establish a substantively negligible difference.

4.4 Cross-issue generalizability analysis

We finally examined whether the dependency–engagement association generalized beyond educational issues. The regression framework was extended to two additional issue domains: marriage and childbearing issues and social pressure issues. The results revealed different patterns of cross-issue generalizability across the two platforms (Table 4).

On Xiaohongshu, dependency coefficients were positive for education (b = 0.145), marriage/childbearing (b = 0.190), and social pressure (b = 0.203). All three survived Holm correction across the six platform-by-domain coefficients (adjusted $p = 0.003$, < 0.001, and < 0.001, respectively). These separate models describe within-platform associations; they do not alone demonstrate differences from Douyin.

TABLE 3 Item-level comparison of educational issue engagement on Douyin and Xiaohongshu (N = 508).

Item	M (DY)	SD (DY)	M (XHS)	SD (XHS)	Mean diff.	95% CI	t (507)	p [Holm]
Liking/commenting (reactive)	3.368	1.173	3.222	1.201	0.146	[0.022, 0.269]	2.322	0.021 [0.062]
Sharing/forwarding (reactive)	3.118	1.277	2.907	1.298	0.211	[0.075, 0.346]	3.057	0.002 [0.009]**
Emotional expression	3.122	1.252	3.091	1.290	0.031	[−0.096, 0.159]	0.485	0.628 [0.628]
Reinforcement-related participation	3.457	1.141	3.382	1.213	0.075	[−0.046, 0.196]	1.212	0.226 [0.452]

Dual-platform users (N = 508). All items use 5-point scales. Positive differences indicate higher Douyin scores. DY = Douyin; XHS = Xiaohongshu. The final column gives raw p followed by Holm-adjusted p in brackets across the four comparisons. Asterisks refer to adjusted values: ** $p < 0.01$. The unadjusted 95% intervals are descriptive and are not simultaneous intervals.

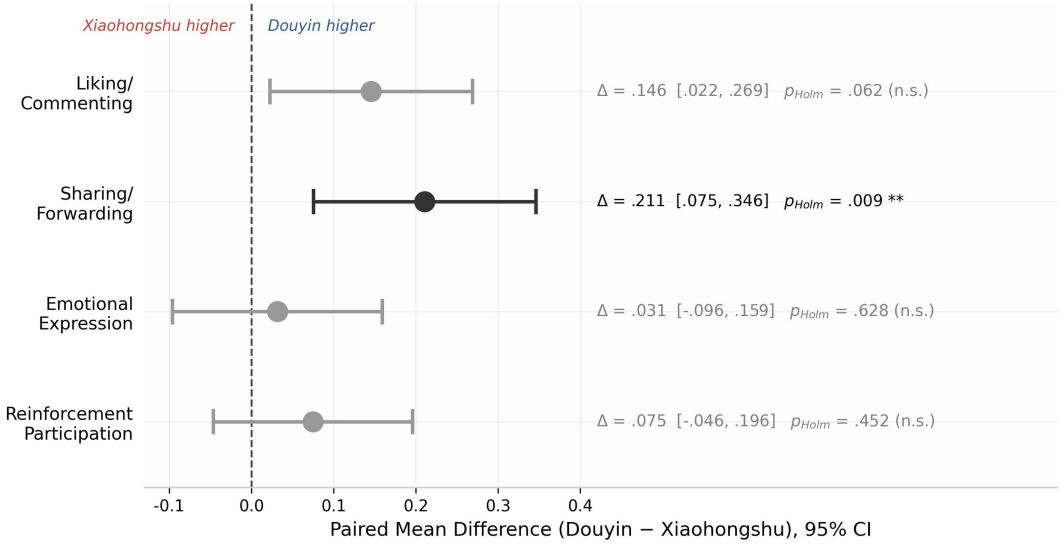


FIGURE 3
Paired mean differences (Douyin - Xiaohongshu) with 95% CIs for four engagement behaviors; positive values indicate higher engagement on Douyin. Only sharing/forwarding remained significant after Holm correction (Delta = 0.211, 95% CI [0.075, 0.346], p-Holm = 0.009); liking/commenting (Delta = 0.146, p-Holm = 0.062), emotional expression (Delta = 0.031, p-Holm = 0.628), and reinforcement participation (Delta = 0.075, p-Holm = 0.452) were non-significant.

TABLE 4 Extended analysis: OLS regression models of issue engagement across issue types.

Platform	Issue domain	b	SE	95% CI	p [Holm]	R^2	N
Douyin	Educational	0.136**	(0.040)	[0.058, 0.214]	< 0.001 [0.003]	0.109	660
Douyin	Marriage/ Childbearing	0.000	(0.043)	[−0.084, 0.084]	1.000 [1.000]	0.039	660
Douyin	Social pressure	0.086	(0.042)	[0.004, 0.167]	0.040 [0.079]	0.082	660
Xiaohongshu	Educational	0.145**	(0.044)	[0.058, 0.232]	0.001 [0.003]	0.086	548
Xiaohongshu	Marriage/ Childbearing	0.190***	(0.044)	[0.103, 0.277]	< 0.001 [< 0.001]	0.105	548
Xiaohongshu	Social pressure	0.203***	(0.043)	[0.118, 0.289]	< 0.001 [< 0.001]	0.128	548

Unstandardized OLS dependency coefficients with conventional standard errors are reported. The p column gives raw p followed by Holm-adjusted p in brackets across six platform-by-domain coefficients. Stars refer to adjusted values: *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$. Covariates and coding are specified in Measures. Direct participant-clustered platform interactions are reported in Table A9; separate model significance does not test between-platform slope differences.

On Douyin, education remained significant after correction (b = 0.136, adjusted p = 0.003), marriage/childbearing did not (b ≈ 0.000, adjusted p = 1.000), and social pressure did not (b = 0.086, raw p = 0.040, adjusted p = 0.079; HC3 p = 0.059). The social-pressure association also became non-significant when the continuous-scrolling dependency item was removed (b = 0.053, p = 0.182). This weaker result should be interpreted as sensitive to measurement and inference choices.

Direct paired-sample interaction tests offered qualified support for H3. The education interaction was not significant (b = 0.003, adjusted p = 0.955), with equivalence also inconclusive. For marriage/childbearing, b = 0.186, SE = 0.060, 95% CI [0.069, 0.303], raw p = 0.002 and

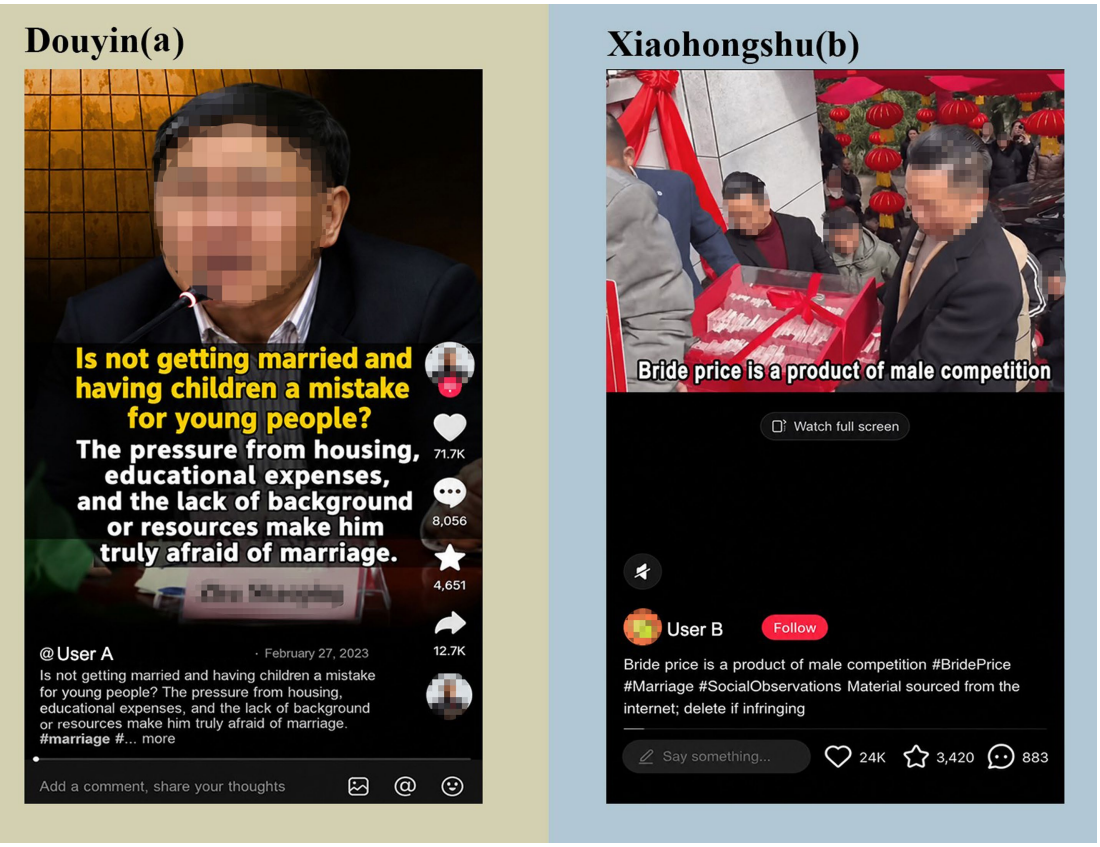


FIGURE 4
De-identified illustrative screenshots of Douyin (panel a) and Xiaohongshu (panel b) posts on marriage/childbearing topics: panel a shows a short video questioning whether not marrying and having children is a mistake for young people (@User A, February 27, 2023; 71.7K likes, 8,056 comments, 4,651 favorites, 12.7K shares); panel b shows a graphic-text note describing bride price as a product of male competition (User B; 24K likes, 3,420 favorites, 883 comments). Faces are pixelated and usernames pseudonymized. The screenshots are provided for context only and are neither a measure of feed diversity nor statistical evidence. Reproduced with permission.

Holm-adjusted $p = 0.004$; for social pressure, b = 0.188, SE = 0.057, 95% CI [0.076, 0.300], raw $p = 0.001$ and adjusted $p = 0.003$. Thus, the evidence for steeper Xiaohongshu slopes is supported for the latter two domains, rather than inferred from separate-platform significance patterns. Figure 4 provides de-identified illustrative screenshots for context; it is neither a measure of feed diversity nor statistical evidence.

5 Discussion

5.1 Key findings and theoretical implications

This study examined whether algorithmic feed dependency was associated with public issue engagement across Douyin and Xiaohongshu, yielding three main findings. First, algorithmic feed dependency was positively associated with educational issue engagement on both platforms. This suggests that a preliminary perceived-reliance composite is linked to engagement, with stable educational results after excluding its continuous-scrolling item.

The finding extends media system dependency theory to algorithmically governed platform environments. Whereas the original framework focused on audience reliance on media institutions, platformized media environments increasingly organize information access through algorithmic curation. In this context, the locus of dependency shifts from institutional media outlets to recommendation systems that filter, rank, and repeatedly surface issue-relevant content (Bucher, 2018; Napoli, 2014). We therefore treat algorithmic feed dependency as a system-level form of media reliance, that is, reliance on the algorithmic and architectural arrangements through which public issues become visible.

The findings also extend prior work on algorithm dependency and algorithmic content selection. Existing research has shown that algorithm dependency shapes platformized news consumption (Schaetz, 2023) and that algorithmic content selection structures users' information exposure pathways (Zarouali et al., 2022). The present study adds that such reliance is associated not only with news exposure, but also with engagement in educational, social, and civic issues circulating in non-news platform environments. In doing so, it links algorithmic dependency to issue engagement rather than only to information access.

The measurement contribution remains preliminary. The administered dependency measure combines access pathway, continuous scrolling, and recommendation fit, while the fourth engagement item combines confidence and discussion willingness. The exclusion checks support the stability of educational associations, but do not resolve these content-validity limitations or establish discriminant validity against validated habit and preference scales. We therefore distinguish a useful empirical proxy from a fully validated dependency construct.

Second, observed educational responses differed modestly across platforms. Only sharing/forwarding remained significant within the four-item family after Holm correction; liking/commenting did not. This is partial support for H2a, rather than evidence that all reactive behaviors are higher on Douyin. Non-significant expressive and reinforcement-item contrasts also do not establish equivalence.

The educational interaction was non-significant, and the 90% interval extended beyond the upper equivalence bound. Neither a slope difference nor equivalence was established. Consequently, the data cannot rank engagement-form differences as more important than slope differences simply by comparing their *p*-values. The title and conclusions therefore describe the observed association with engagement form and breadth without asserting that architecture determines how, but not whether, engagement occurs.

The sharing result is compatible with an affordance-based account in which immediate sharing is convenient within immersive feeds. However, the study did not measure behavioral costs, experimentally vary interfaces, or observe actual actions. Selection into platforms, differing issue exposure, and self-report interpretation are plausible alternative explanations. Architectural mechanisms remain interpretive hypotheses.

Third, cross-issue patterns were supported by two kinds of evidence with distinct meanings. Adjusted within-platform coefficients were significant across all three domains on Xiaohongshu and only education on Douyin. Direct interaction tests supported steeper Xiaohongshu slopes for marriage/childbearing and social pressure, but did not establish either a difference or equivalence for education. The Douyin social-pressure coefficient was sensitive to correction and item exclusion.

A topic-based navigation and discussion account offers one possible explanation for the Xiaohongshu pattern (Zhai, 2025). Yet issue persistence, exposure breadth, and community structure were not measured in this questionnaire. Broader issue ecology should therefore be treated as a proposed mechanism to test with content samples and behavioral logs, not an observed characteristic established by the regression results.

Douyin showed a more selective pattern. Its short-video feed is organized around fast-paced content delivery and immediate interaction, which may make engagement more dependent on issue salience and personal relevance. Educational issues are directly tied to the lived experience of university students and recent graduates, whereas marriage and childbearing issues may be less immediately relevant for many respondents in this sample. This is an untested interpretation of why feed dependency on Douyin was linked more consistently to educational issue engagement than to engagement with other issue domains.

Taken together, the study distinguishes three empirical questions: paired engagement means, cross-platform association slopes, and variation across issue domains. The corrected item evidence is limited to sharing/forwarding; the educational interaction is inconclusive about equivalence; and interaction evidence supports differences for marriage/childbearing and social pressure. Figure 5 integrates these statistical conclusions while separating them from untested architectural explanations.

5.2 Alternative explanations and causal boundaries

The observed associations should be interpreted within clear causal boundaries. Because the study relies on cross-sectional survey data, it cannot establish the temporal ordering between algorithmic feed dependency and public issue engagement. The results therefore indicate patterned associations rather than evidence of a unidirectional causal effect.

One alternative explanation is that respondents with stronger prior issue interest may both rely more on algorithmic feeds and engage more frequently with issue-related content. In this case, feed dependency would partly reflect an underlying disposition toward issue attention or civic expression, rather than operating independently as a driver of engagement. Although public issue attention frequency was included as a covariate, unmeasured factors, including political interest, media literacy, issue identification, emotional sensitivity, and expressive tendency, may still confound the observed association.

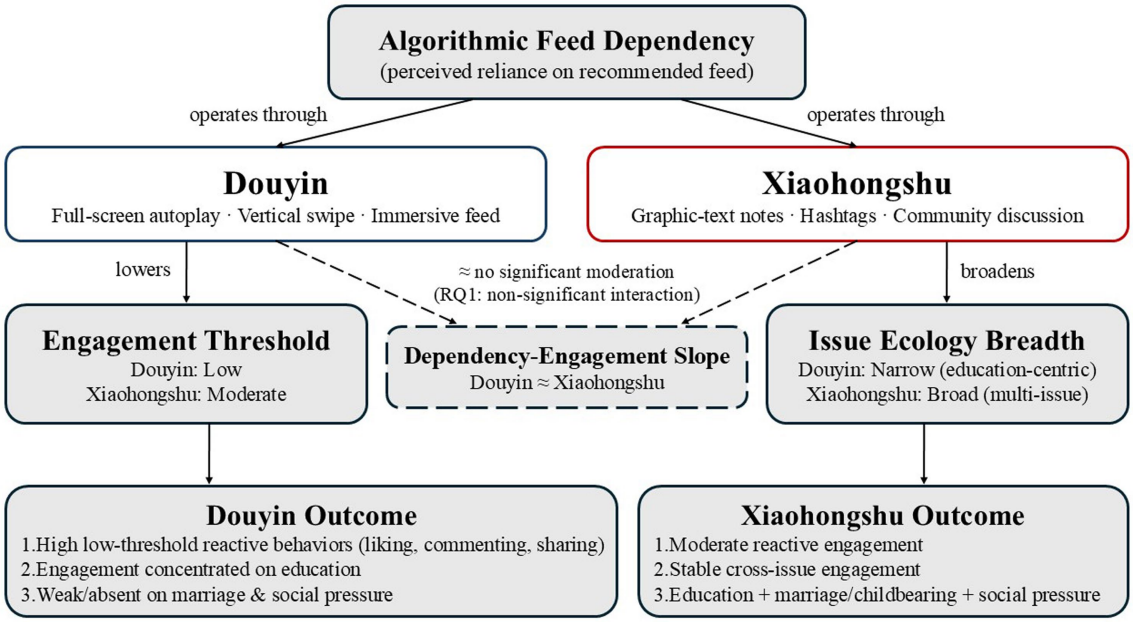


FIGURE 5
Summary of the proposed platform-specific pathways. Algorithmic feed dependency operates through platform features: on Douyin (full-screen autoplay, vertical swipe, immersive feed) it lowers the engagement threshold, yielding high low-threshold reactive behaviors concentrated on education and weak/absent on marriage and social pressure; on Xiaohongshu (graphic-text notes, hashtags, community discussion) it broadens issue ecology breadth, yielding moderate but stable cross-issue engagement (education, marriage/childbearing, social pressure). The dependency-engagement slope is similar across platforms (dashed box; RQ1: non-significant interaction).

A second possibility concerns reciprocal reinforcement. Engagement behaviors, including liking, commenting, and sharing, may increase subsequent exposure to similar content through recommendation systems. Feed dependency and issue engagement may therefore develop through reinforcing spirals, rather than through a one-directional pathway (Slater, 2007).

These alternative explanations do not negate the empirical pattern observed in this study, but they define its inferential scope. The findings show that perceived reliance on algorithmically curated feeds is systematically associated with public issue engagement across platform and issue contexts. Future research should use longitudinal designs, experiments, or behavioral log data to examine the temporal sequence linking feed dependency, issue exposure, and engagement.

5.3 Limitations and future directions

First, the sample was non-probability and potentially network-clustered. Although respondents were recorded in 30 provincial-level regions, 56.8% came from the five largest provincial groups and recruitment proceeded through WeChat networks. The sample cannot represent all Chinese university students or young adults. Network homophily can bias estimates in either direction; respondent-clustered errors do not correct unobserved referral-chain dependence. Current-student versus recent-graduate status was not collected separately and cannot be summarized or adjusted. Broader recruitment and recording of institution and referral-chain identifiers are needed.

Second, the cross-sectional design limits causal inference. Because all variables were measured at one time point, the temporal ordering between algorithmic feed dependency and issue engagement cannot be established. The observed associations may partly reflect reverse causality or reciprocal reinforcement, specifically the possibility that issue-engaged users rely more heavily on algorithmic feeds and that engagement behaviors subsequently shape algorithmic exposure. Future studies should use panel designs, experience sampling, behavioral log data, or quasi-experimental designs based on platform changes to examine the temporal sequence linking feed dependency, issue exposure, and engagement.

Third, the measures remain preliminary. Continuous scrolling overlaps with use intensity and habit; perceived recommendation fit may overlap with preference; and the reinforcement item combines epistemic confidence with behavioral willingness. The present data cannot retrospectively split that item or establish expert-reviewed content validity. Separate confidence and participation-willingness items, cognitive interviews, expert review, and validated neighboring scales are needed in a future wave. Dependency and engagement were self-reported in the same questionnaire, so shared response tendencies and common-method variance may inflate associations. The first-component diagnostic cannot quantify or rule out that inflation. Behavioral logs, observed engagement, and temporally separated measures would provide stronger validation.

Fourth, the control variable framework was necessarily limited. Political interest, media literacy, issue identification, and expressive disposition were not included because validated measures for these constructs were not available in the present survey. Their omission may leave residual confounding in the relationship between feed dependency and issue engagement. Future research should incorporate these variables to assess whether feed dependency retains explanatory value after accounting for broader civic and media-related dispositions.

Finally, repeated-measures CFA supported loading and intercept comparability under a normal-theory continuous-item model, but categorical threshold invariance, robust ordinal estimation, and strict residual invariance were not assessed. Multiple exploratory tests and small corrected contrasts require caution; exploratory adjustments do not turn the study into a preregistered design. Results also are specific to this Chinese platform and recruitment context. Future studies should test their stability across samples, issue domains, and platform environments.

6 Conclusion

Drawing on 718 valid survey responses, this study found positive conditional associations between perceived feed dependency and educational issue engagement on Douyin and Xiaohongshu. These educational associations persisted even after removing the continuous-scrolling item and, separately, the double-barreled engagement item. These findings support further investigation of information-access reliance alongside general use intensity, however, issues such as content validity, chronological order, and unmeasured confounding factors remain to be addressed.

The differences in paired means for the education variable were small; after adjusting for the four-group comparison, only sharing/forwarding remained statistically significant. The education interaction did not reveal a slope difference or equivalence. Direct interaction tests indicate that, with regard to marriage/childbearing and social pressure, the relationship between the degree of dependence on Xiaohongshu and user engagement exhibits a steeper slope. These are platform- and issue-specific statistical associations, they do not prove architecture causes engagement thresholds or issue breadth.

The study extends the empirical questions raised by media system dependency theory to perceived reliance on recommendation systems. The conceptual distinction made by this theory between reliance and use intensity remains valuable, but the current proxy does not fully separate dependency from habitual scrolling or recommendation preference. Validation with revised items, neighboring constructs, and behavioral measures is needed before stronger theoretical claims are warranted.

For platform research and governance, the findings motivate examination of issue visibility, sharing affordances, and exposure diversity with direct measures. Longitudinal, behavioral, or experimental designs should determine whether the proposed architectural mechanisms explain the associations reported here. The present study provides comparative evidence for these questions rather than a causal basis for design prescriptions.

Data availability statement

The original contributions presented in the study are included in the article/Supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. The study was approved by the Ethics Committee of Qilu Institute of Technology (No. EC-QIT-2025-09-0011). The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study. The social media data was accessed and analyzed in accordance with the platform's terms of use and all relevant institutional/national regulations.

Author contributions

ZQ: Data curation, Investigation, Writing – review & editing. YL: Writing – review & editing, Writing – original draft, Formal analysis, Visualization, Supervision, Methodology, Conceptualization. DL: Investigation, Writing – review & editing, Resources. ZL: Validation, Writing – review & editing, Data curation, Investigation. BW: Visualization, Writing – review & editing, Software. HS: Supervision, Project administration, Writing – review & editing. XH: Writing – review & editing, Project administration.

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The author(s) declared that this work was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Generative AI statement

The author(s) declared that Generative AI was used in the creation of this manuscript. Generative AI was used to assist manuscript editing, reviewer-response drafting, and preparation of code for additional analyses. The authors are responsible for verifying the analyses, references, ethical statements, and final content before submission.

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Supplementary material

The Supplementary material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyg.2026.1911321/full#supplementary-material

References

Ball-Rokeach, S. J., and DeFleur, M. L. (1976). A dependency model of mass-media effects. *Commun. Res.* 3, 3–21. doi: 10.1177/009365027600300101

Beam, M. A. (2014). Automating the news: how personalized news recommender system design choices impact news reception. *Commun. Res.* 41, 1019–1041. doi: 10.1177/0093650213497979

Bennett, W. L., and Segerberg, A. (2012). The logic of connective action: digital media and the personalization of contentious politics. *Inf. Commun. Soc.* 15, 739–768. doi: 10.1080/1369118X.2012.670661

Boulianne, S. (2015). Social media use and participation: a meta-analysis of current research. *Inf. Commun. Soc.* 18, 524–538. doi: 10.1080/1369118x.2015.1008542

Boulianne, S., and Hoffmann, C. P. (2024). Digital inclusion through algorithmic knowledge: curated flows of civic and political information on Instagram. *Media Commun.* 12:Article 8102. doi: 10.17645/mac.8102

Bucher, T. (2018). *If… then: Algorithmic power and Politics*. New York, NY, USA: Oxford University Press.

Chen, F. F. (2007). Sensitivity of goodness of fit indexes to lack of measurement invariance. *Struct. Equ. Model.* 14, 464–504. doi: 10.1080/10705510701301834

Chen, X., Kaye, D. B. V., and Zeng, J. (2021). #PositiveEnergy Douyin: constructing "playful patriotism" in a Chinese short-video application. *Chin. J. Commun.* 14, 97–117. doi: 10.1080/17544750.2020.1761848

Cohen, J. (1988). *Statistical power Analysis for the Behavioral Sciences*. 2nd Edn Hillsdale, NJ, USA: Lawrence Erlbaum Associates.

DeFleur, M. L., and Ball-Rokeach, S. J. (1989). *Theories of mass Communication*. 5th Edn White Plains, NY, USA: Longman.

Dujeancourt, E., and Garz, M. (2023). The effects of algorithmic content selection on user engagement with news on twitter. *Inf. Soc.* 39, 263–281. doi: 10.1080/01972243.2023.2230471

Evans, S. K., Pearce, K. E., Vitak, J., and Treem, J. W. (2017). Explicating affordances: a conceptual framework for understanding affordances in communication research. *J. Comput. Mediat. Commun.* 22, 35–52. doi: 10.1111/jcc4.12180

Fornell, C., and Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *J. Mark. Res.* 18, 39–50. doi: 10.1177/002224378101800104

Gerbaudo, P. (2026). TikTok and the algorithmic transformation of social media publics: from social networks to social interest clusters. *New Media Soc.* 28, 1019–1036. doi: 10.1177/14614448241304106

Gillespie, T. (2014). "The relevance of algorithms," in *Media Technologies: Essays on Communication, Materiality, and Society*, eds. T. Gillespie, P. J. Boczkowski and K. A. Foot (Cambridge, MA, USA: MIT Press), 167–194.

Hu, L. T., and Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis. *Struct. Equ. Model.* 6, 1–55.

Omori, K., Jung, J. -Y., and Croucher, S. (2026). Proposing heightened emotions social media dependency model: review and extension of media system dependency theory. *Ann. Int. Commun. Assoc.* 50, 246–254. doi: 10.1093/anncom/wlag005

Karizat, N., Delmonaco, D., Eslami, M., and Andalibi, N. (2021). "Algorithmic folk theories and identity," in *Proceedings of the ACM on Human-Computer Interaction, 5(CSCW2)*. New York, NY, USA: Association for Computing Machinery (ACM). 305.

Kaye, D. B. V., Chen, X., and Zeng, J. (2021). The co-evolution of two Chinese mobile short video apps: parallel platformization of Douyin and TikTok. *Mobile Media Commun.* 9, 229–253. doi: 10.1177/2050157920952120

Klinger, U., and Svensson, J. (2018). The end of media logics? On algorithms and agency. *New Media Soc.* 20, 4653–4670. doi: 10.1177/1461444818779750

LaRose, R. (2010). The problem of media habits. *Commun. Theory* 20, 194–222. doi: 10.1111/j.1468-2885.2010.01360.x

Lee, A. Y., Mieczkowski, H., Ellison, N. B., and Hancock, J. T. (2022). "The algorithmic crystal: conceptualizing the self through algorithmic personalization on TikTok," *Proceedings of the ACM on Human-Computer Interaction*, New York, NY, USA: Association for Computing Machinery 6, 1–22. doi: 10.1145/3555601

Lim, C., and Kim, S. (2024). Examining factors influencing the user's loyalty on algorithmic news recommendation service. *Humanit. Soc. Sci. Commun.* 11:Article 10. doi: 10.1057/s41599-023-02516-x

Literat, I., and Kligler-Vilenchik, N. (2021). How popular culture prompts youth collective political expression and cross-cutting political talk on social media. *Soc. Media + Soc.* 7:20563051211008821. doi: 10.1177/20563051211008821

Napoli, P. M. (2014). Automated media: an institutional theory perspective on algorithmic media production and consumption. *Commun. Theory* 24, 340–360. doi: 10.1111/comt.12039

Nieborg, D. B., and Poell, T. (2018). The platformization of cultural production. *New Media Soc.* 20, 4275–4292. doi: 10.1177/1461444818769694

Norman, G. (2010). Likert scales, levels of measurement and the 'laws' of statistics. *Adv. Health Sci. Educ.* 15, 625–632. doi: 10.1007/s10459-010-9222-y

Pariser, E. (2011). *The Filter Bubble: What the Internet is hiding from you*. New York, NY, USA: Penguin Press.

Pilati, F., Sacco, P. L., Scianna, M., and Artime, O. (2025). The broadcasting trap: TikTok and the "democratization" of digital content production. *Humanit. Soc. Sci. Commun.* 12:496. doi: 10.1057/s41599-025-04797-w

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., and Podsakoff, N. P. (2003). Common method biases in behavioral research. *J. Appl. Psychol.* 88, 879–903. doi: 10.1037/0021-9010.88.5.879

Rader, E., and Gray, R. (2015) "Understanding user beliefs about algorithmic curation in the Facebook news feed," in *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems* 173–182 New York, NY, USA: ACM

Schaetz, N. (2023). Algorithm dependency in platformized news use. *New Media Soc.* 27, 1360–1377. doi: 10.1177/14614448231193093

Slater, M. D. (2007). Reinforcing spirals: the mutual influence of media selectivity and media effects. *Commun. Theory* 17, 281–303. doi: 10.1111/j.1468-2885.2007.00296.x

Tanhan, F., and Çam, Z. (2011). The relation between mobbing behaviors teachers in elementary schools are exposed to and their burnout levels. *Procedia. Soc. Behav. Sci.* 15, 2704–2709. doi: 10.1016/j.sbspro.2011.04.174

Theocharis, Y. (2015). The conceptualization of digitally networked participation. *Social Media + Society* 1, 1–14. doi: 10.1177/2056305115610140

Theocharis, Y., Boulianne, S., Koc-Michalska, K., and Bimber, B. (2023). Platform affordances and political participation. *West Eur. Polit.* 46, 788–811. doi: 10.1080/01402382.2022.2087410

van Dijck, J., Poell, T., and de Waal, M. (2018). *The Platform Society: Public Values in a Connective World*. Oxford, UK: Oxford University Press.

Ytre-Arne, B., and Moe, H. (2021). Folk theories of algorithms: understanding digital irritation. *Media Culture Soc.* 43, 807–824. doi: 10.1177/0163443720972314

Zarouali, B., Boerman, S. C., and de Vreese, C. H. (2021). Is this recommended by an algorithm? The development and validation of the algorithmic media content awareness scale (AMCA-scale). *Telemat. Inform.* 62:101607. doi: 10.1016/j.tele.2021.101607

Zarouali, B., Dobber, T., De Pauw, G., and de Vreese, C. (2022). Using a personality-profiling algorithm to investigate political microtargeting. *Commun. Res.* 49, 1066–1091. doi: 10.1177/0093650220961965

Zhai, H. (2025). Hashtags and hope: tracing Chinese digital spirituality through #WishMeABabyBoy trend on Xiaohongshu (Rednote). *Soc. Media + Soc.* 11:20563051251369816. doi: 10.1177/20563051251369816