SOCIAL SCIENCES

Hug fans or follow celebrities? How nationalism is reinforced on Chinese social media

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How nationalism spreads and is reinforced has long been debated. This study examines how nationalistic messages and sentiments propagate on Chinese social media, focusing on interactions between celebrities and fans. We analyzed more than 8 million Weibo microblogs and comments, classified their content using machine-learning techniques, and examined the dynamics between celebrities and fans. Contrary to conventional wisdom, our findings reveal that fans exert a stronger influence on celebrities than vice versa in spreading nationalism. Fans often shape the nationalist narratives that celebrities amplify, with those aligned with specific political leanings (e.g., within the state-conformist camp) having a greater influence. These results highlight the critical role of grassroots online communities in shaping nationalism in nondemocratic contexts, offering insights into the dynamic interactions between the masses and influential figures in reinforcing nationalist ideologies and sentiments.

INTRODUCTION

Ideas and sentiments are often the main drivers of critical social changes (*1*–*3*). How ideas, opinions, and sentiments spread and are reinforced within a society, especially between elites and the public, has been debated intensely among scholars (*4*–*8*). As social media has emerged as a dominant platform, how ideas, opinions, and sentiments are shared online and affect human behaviors has also become a topic of interest (*9*–*11*).

Over the past decade, there has been a growing trend toward nationalism around the world (*12*, *13*). China has experienced a notable surge in nationalism that has coincided with its economic and geopolitical ascension over the past several decades (*14*–*16*). Without open public political debates or public opinion polls, where nationalist debates tend to occur in democratic settings, in China, nationalist discussions and debates take place on social media (*17*, *18*). A robust body of research has documented the growth of nationalism on Chinese social media, yet there is still considerable debate about the mechanisms and dynamics of this growth (*17*–*21*).

While the findings and conclusions differ, most studies assume that nationalism on social media functions as a propaganda tool often used by the Chinese government and its organs to influence the public. Digital authoritarian literature emphasizes that authoritarian states do far more than simply remove "undesirable" posts; instead, they instill "positive" interventions—coordinated troll armies or state-sponsored commentators—to flood the network with proregime content (*22*–*24*). Moreover, the state can also directly or indirectly influence platform algorithms; recommendation engines are reportedly calibrated, at times, to prioritize nationalist narratives, elevate patriotic hashtags into trending lists, and suppress or demote critical voices, thereby shaping the public sphere in favor of state-aligned discourse (*25*, *26*). However, such a state-centric view does not capture the full picture. Given the nature of interactions on social media, communication among users and, thus, the spread of messages cannot simply be state-manipulated. Therefore, nationalism on social media must spread and resonate within virtual networks where people are interconnected, and their posts are visible via the layers of connections they have built. Here, we focus on one of the most prominent virtual relationships: the celebrity–fan relationship (*27*–*30*).

Extant research suggests that celebrities play a critical role in promoting nationalism in China via their social media activities. Theoretically, this celebrity-driven nationalism may arise from two distinct sources: on one hand, implicit or explicit state coercion—an individual-level manifestation of digital authoritarianism—where official endorsements, resource incentives, or the threat of platform sanctions nudge celebrities toward patriotic messaging; on the other hand, celebrities may proactively cater to fan-community expectations, market incentives, or their own convictions, aligning with what their audiences want. Empirically, one study finds that the Chinese Communist Youth League frequently tags pop idols in nationalistic posts to boost engagement, particularly with pride- and hostility-oriented messages (*31*). Another study shows that consumption of entertainment media is positively associated with both satisfaction with the Chinese regime and nationalist attitudes toward foreign countries (*32*). These findings align with broader evidence of top-down dynamics in Chinese online nationalism, where state actors or celebrities set the agenda and fans largely follow (*33*). In summary, existing work shows that celebrity-driven nationalism in China—whether prompted by state pressure or by celebrities' own alignment with fan and market incentives—functions as a state-aligned, top-down agenda-setting mechanism, where celebrities act as intermediaries that help amplify nationalist discourse from the state to the public.

By contrast, other studies on Chinese nationalism have argued that the surge in nationalism is a movement from the bottom (*12*, *34*), i.e., that the growth in nationalism is being driven by netizens rather than being guided by government organizations, state-run media, or celebrities. This argument suggests that compared with celebrities, fans might be equally or even more active and influential in spurring expressions of nationalism. For example, a recent study finds that fans who are active in online fan communities tend to express stronger nationalist sentiments and post more pro-government expressions online (*35*). Following this line of reasoning, celebrities may feel compelled to express nationalistic views in response to the expectations or pressure from their fans.

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However, systematic analyses of the relative influence between fans and celebrities in the dissemination of political messages and sentiments, including nationalism, remain limited, especially in non-democratic contexts like China. This stands in contrast to the substantial scholarly attention afforded to the political influence of celebrities in democratic settings, with a specific focus on the engagement of prominent entertainers in the United States. In recent years, the political messaging and campaign activities of celebrities, especially through online platforms, have attracted substantial academic interest (*29*, *30*, *36*–*41*). Focusing on China, this study examines the bidirectional interactions between fans and celebrities (i.e., from fans to celebrities and from celebrities to fans) on social media to investigate how nationalism spreads and how individuals' preexisting political attitudes shape these interactions.

We examine celebrity-fan interactions from 2019, focusing on the period before and after the onset of the anti-government protests in Hong Kong that began in June of that year. During this time, nationalistic expressions surged on social media, particularly within China. Platforms such as Weibo and WeChat played a central role in amplifying these sentiments, driven by both state propagandists and organic public reactions. Prominent celebrities frequently posted pro-government or nationalistic messages, aligning with and reinforcing the government's stance. Fans and followers often engaged with or echoed these sentiments. One well-known case is a Weibo post by Liu Yifei in August 2019. The Chinese-American actress, widely recognized for her role in Disney's live-action remake of *Mulan*, publicly expressed support for the Hong Kong police during the anti-government protests. Her statement quickly attracted international attention and sparked widespread controversy. In mainland China, her post was met with likes, praise, and reposts by many Weibo fans and netizens, fueling nationalist sentiments. Conversely, in Hong Kong and among international audiences, her comments triggered substantial backlash, including calls to boycott the *Mulan* film. The hashtag #BoycottMulan trended on social media platforms such as Twitter.

In our study, we build and test our model using a vector autoregression (VAR) method. This methodology allows for analysis of the bidirectional, dynamic interactions between celebrities and their fans, providing empirical evidence on how nationalist sentiments spread and are reinforced on social media. The VAR model is particularly well-suited for capturing the temporal dependencies and feedback loops inherent in the online interactions between celebrities and their fans. By incorporating lagged values of both celebrity and fan activities, the VAR model can identify the direction and magnitude of influence between these two groups over time. Unlike existing research that has primarily focused on the interactions between political elites and the general public, our research pivots toward understanding the influence of nonpolitical elites, such as entertainers and celebrities, and their followers. In addition, while prior studies have typically examined the public at large or potential constituents as the primary recipients of elite-driven messages, our analysis delves into the role of followers or fans in propagating nationalistic sentiments. This methodological approach offers a more nuanced understanding of the mechanisms through which nationalism is disseminated and reinforced within the digital sphere in nondemocratic contexts.

RESULTS

Figure 1 depicts the cumulative impulse response functions (IRFs), which represent how a one-unit (one SD) increase in one time series exerts an accumulated impact on the other time series. The results indicate that fans' nationalistic posts predict a subsequent rise in celebrities' nationalistic posts. The response becomes significant on the second day following the one-SD shock in fans' comments and remains significant throughout the 10-day estimation window after the shock. By contrast, the cumulative impact of celebrities' nationalistic posts on fans' future nationalistic posts is not statistically significant at the 95% confidence level.

Figure 2 shows that nationalist posts by fans predict subsequent nationalistic messaging by other fans, following patterns similar to

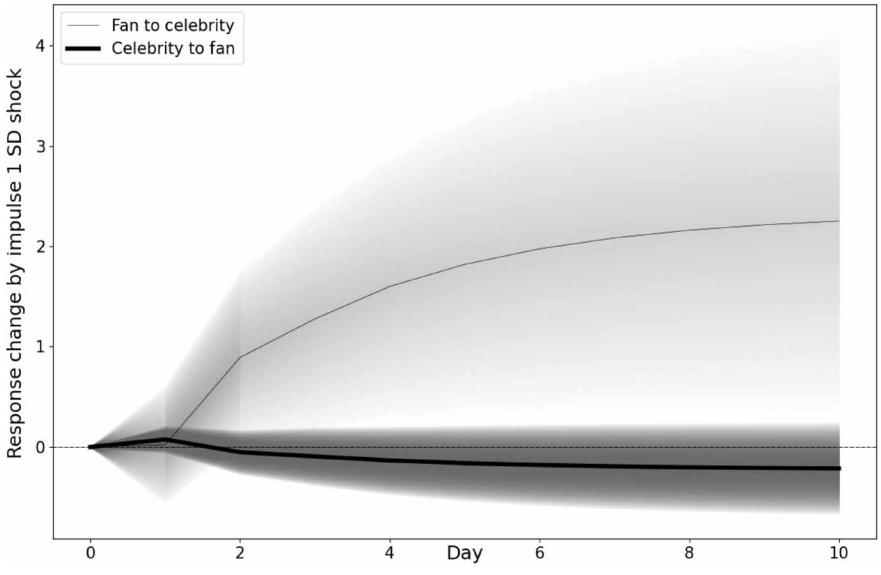

Fig. 1. Cumulative IRFs between fans and celebrities. The thin solid line measures the cumulative IRF from fans to celebrities. The thick solid line plots the cumulative IRF from celebrities to fans. The 95% confidence intervals are plotted in the gray areas alongside each line. The *x* axis represents the number of days following posts by one group. The *y* axis shows the cumulative change in the other group's nationalist posts (per SD).

the effects of fans' posts on celebrities' posts. By contrast, nationalistic messages by celebrities do not significantly predict nationalistic posts by other celebrities. This suggests that fan engagement plays a more pivotal role in spreading nationalist sentiments to both celebrities and other fans, while celebrities themselves appear less effective at consistently propagating these messages among their peers and their fans.

How do these effects vary based on celebrities' political stances? To explore this, we categorized celebrities and their followers into two groups according to their political attitudes using widely recognized political clustering linked to the 2019 anti-government protests in Hong Kong: Those with state-conformist inclinations (hereafter referred to as the state-conformist camp) and those with nonconformist tendencies (hereafter referred to as the nonconformist camp; see the Materials and Methods and the Supplementary Materials for details on this categorization and additional validation analyses) (*42*, *43*). We compute the cumulative IRF separately within and between these groups. Among state-conformist individuals, fans' nationalist sentiments predict an increase in celebrities' future nationalist posts, whereas celebrity messages have no statistically significant impact on fans (Fig. 3). By contrast, within the nonconformist camp, fans' nationalist expressions have a largely negative

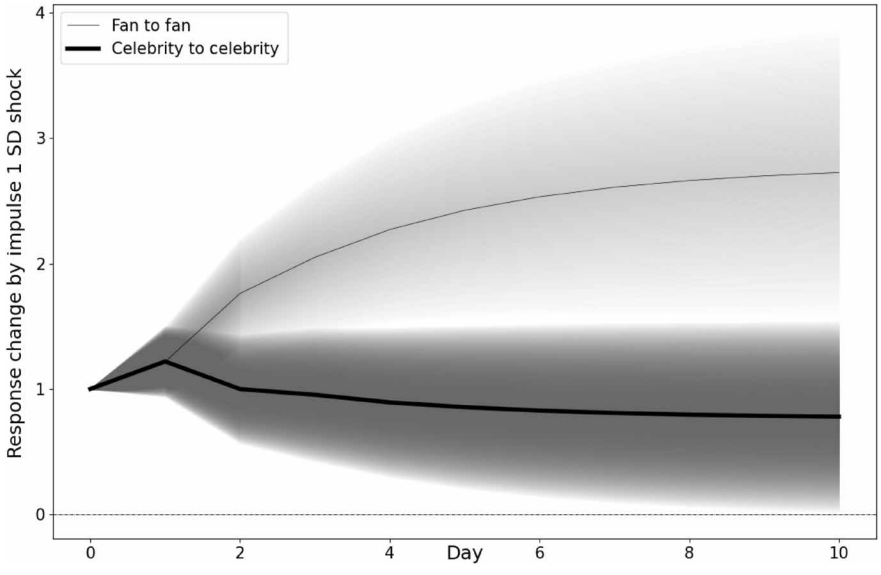

Fig. 2. Cumulative IRFs within fans and within celebrities. The thin solid line measures the cumulative IRF from fans to fans. The thick solid line plots the cumulative IRF from celebrities to celebrities. The gray areas alongside each line represent the 95% confidence intervals. The *x* axis represents the number of days following posts by one group. The *y* axis shows the cumulative change in the other groups' nationalist posts (per SD).

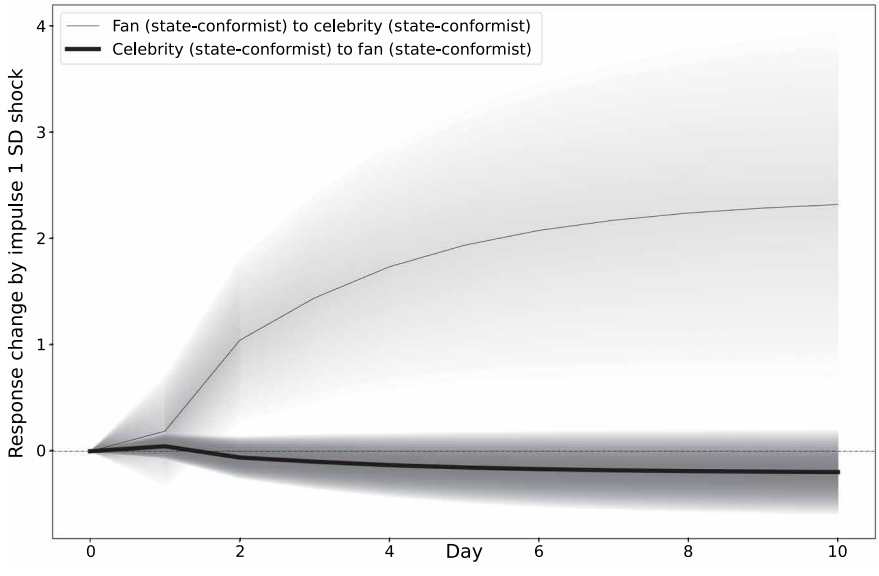

Fig. 3. Cumulative IRFs, restricted to the state-conformist camp (celebrities and fans). The 95% confidence intervals are plotted in the gray areas alongside each line. The *x* axis represents the number of days following posts by one group. The *y* axis shows the cumulative change in the other groups' nationalist posts (per SD).

but statistically insignificant effect on the likelihood of celebrities posting nationalist messages. Similarly, celebrities have no measurable impact on their followers' nationalist expressions in this group (Fig. 4). Overall, our findings suggest that fans' nationalist posts have polarizing effects, reinforcing celebrities' existing political orientations—encouraging state-conformist celebrities to post more nationalist content while prompting nonconformist celebrities to distance themselves from this messaging. We also investigate cross-cutting influences between the two political camps, examining whether celebrities or fans from one camp can influence individuals in the opposing camp (*44*). Figure 5 presents the impact of state-conformist celebrities on nonconformist celebrities and their fans (left) and the influence of state-conformist fans on non-conformist celebrities and their fans (right). Our results show that neither state-conformist celebrities nor their fans exert a significant influence on the nationalist expressions or messaging of nonconformist celebrities or their followers.

Similarly, Fig. 6 depicts the impact of nonconformist celebrities on state-conformist fans and celebrities (left), and the impact of nonconformist fans on state-conformist fans and celebrities (right). As the figures consistently show, none of the cross-group estimations are statistically significant. This indicates that messages by state-conformist celebrities or fans do not prompt nonconformist celebrities or fans to post more nationalistic messages. Likewise, discussions of nationalism by nonconformist celebrities or fans do not lead to increased nationalistic posting by state-conformist celebrities or fans. These results, together with the previous findings, reaffirm the well-documented "echo chamber phenomenon" in political

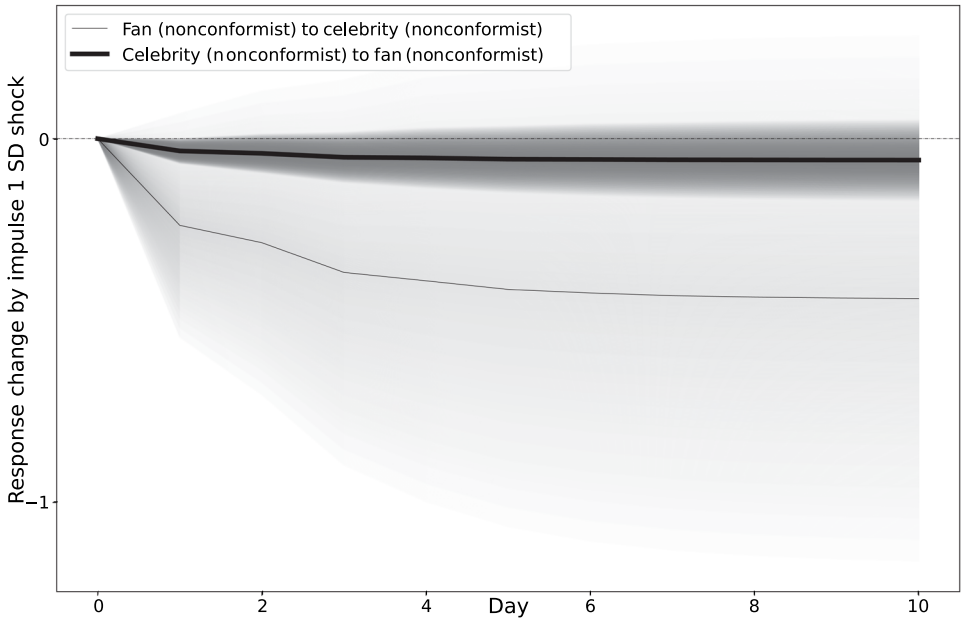

Fig. 4. Cumulative IRFs, restricted to the nonconformist camp (celebrities and fans). The 95% confidence intervals are plotted in the gray areas alongside each line. The *x* axis represents the number of days following posts by one group. The *y* axis shows the cumulative change in the other groups' nationalist posts (per SD).

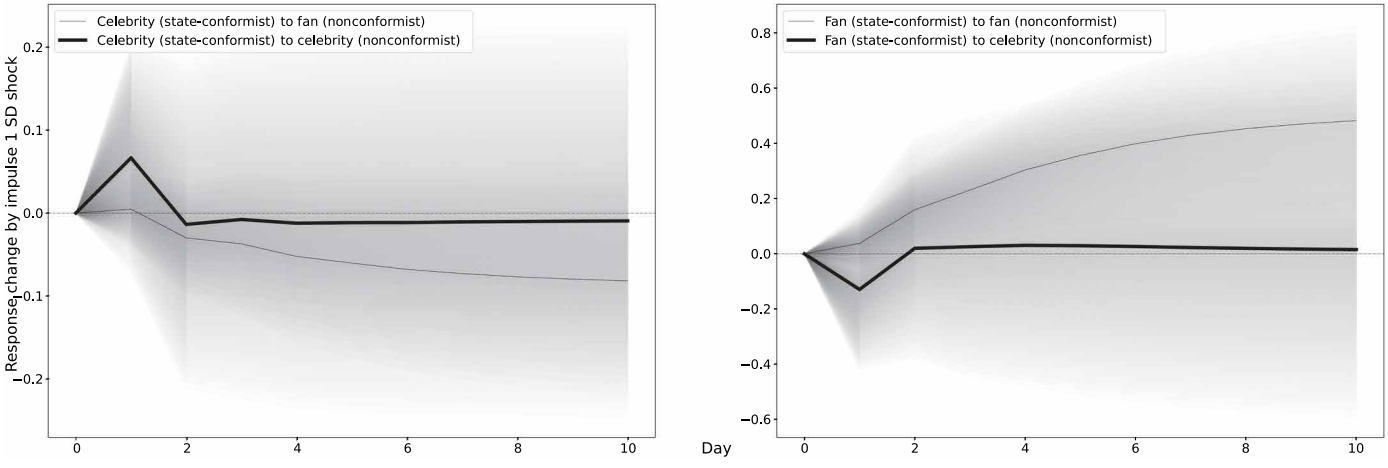

Fig. 5. Cumulative IRFs: state-conformist to nonconformist. The 95% confidence intervals are plotted in the gray areas alongside each line. The *x* axis represents the number of days following posts by one group. The *y* axis shows the cumulative change in the other group's nationalist posts (per SD).

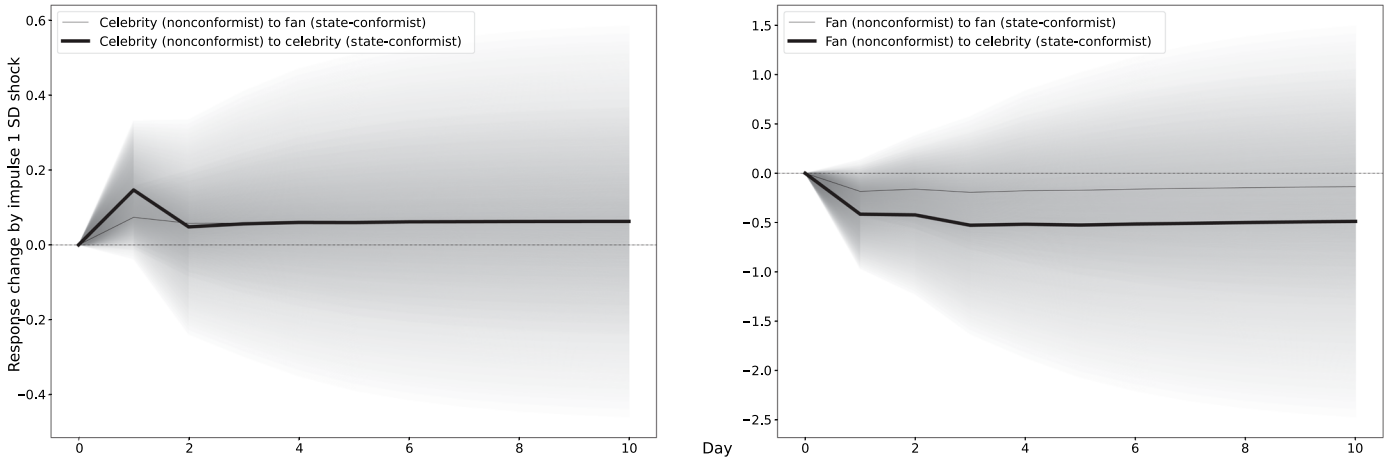

Fig. 6. Cumulative IRFs: nonconformist to state-conformist. The 95% confidence intervals are plotted in the gray areas alongside each line. The *x* axis represents the number of days following posts by one group. The *y* axis shows the cumulative change in the other group's nationalist posts (per SD).

communication on social media (*45*–*48*). This phenomenon illustrates how social media users with specific political views primarily engage with like-minded individuals, reinforcing shared ideologies and intensifying political polarization through ongoing within-group communication.

We conduct additional analyses to confirm that our findings hold across different machine-learning algorithms, alternative criteria of celebrities, and alternative model specifications. We also test the robustness of our findings by removing potential anti-fans, excluding outliers (extremely viral posts), adding celebrity fixed effects, and analyzing non-nationalistic discussions. Details of these analyses are provided in the Supplementary Materials.

DISCUSSION

Our study challenges the conventional belief that elites "lead their followers" in spreading ideologies, including nationalism. Instead, by examining online interactions between entertainers and their fans, we demonstrate that nationalism on Chinese social media often flows from fans to celebrities rather than the other way around—in effect, celebrities follow their fans. Drawing on more than 8 million Weibo microblogs and comments from 2019, we find that fans' nationalistic expressions exert a stronger and more consistent influence on celebrities than vice versa. Using BERTopic for topic modeling, combined with large language model–based labeling, we found that most fan comments were classified as emotional or ideological, rather than performative or other types. A detailed discussion of our classification of nationalistic content is provided in the Supplementary Materials. This underscores the substantial role of ordinary users in shaping the increasingly nationalistic discourse on Chinese social media. Furthermore, our analysis reveals echo-chamber effects within groups that share similar political views, where nationalistic sentiments are amplified among like-minded users rather than fostering dialog across ideological divides.

While our findings highlight the influence of fans in driving online nationalism in China, important questions remain about the broader dynamics between celebrities and fans. In many democracies, celebrities actively engage in social movements and political discourse, often shaping public opinion and influencing policymaking (*36*, *49*), and social media has become a crucial tool through which they exert this influence (*29*, *50*). Scholars find empirical evidence in the United States (*51*, *52*), South Korea (*37*), and the United Kingdom (*53*). Whereas our study highlights a bottom-up dynamic in an authoritarian context where fan nationalism appears to influence celebrity expression, we note that in democracies, celebrities typically have greater freedom to speak and more autonomy in choosing whether and how to engage politically and which partisan interests to support. Consequently, we speculate that bottom-up pressures in democratic contexts may produce diverse responses: Some celebrities may opt to remain apolitical, while others may assertively express divergent political beliefs. This heterogeneity stands in contrast to the more uniform signaling observed in authoritarian regimes and highlights the critical role of political context in shaping celebrity influence.

Future research could examine how these dynamics unfold on social media, particularly the interplay between fans and celebrities within the expansive, multilayered networks users create online. For example, fans with broader networks may exert greater influence over both other fans and celebrities. Although our analysis focuses solely on online interactions, our findings suggest that online nationalism may significantly influence celebrities' professional decisions and shape followers' behaviors as fans, consumers, and citizens. Future research could further investigate how online interactions between celebrities and fans shape their communications and behaviors offline. Last, future research could explore how nationalism is reinforced in less contentious contexts, such as cultural products and national events, where celebrities or even the state play central roles. Investigating these contexts can provide a more comprehensive understanding of whether fan-celebrity dynamics extend beyond politically sensitive moments to everyday expressions. We acknowledge these limitations and identify them as key directions for future research, which could deepen our understanding of how online interactions shape political discourse and behavior more broadly.

MATERIALS AND METHODS

Our sample consists of Weibo microblogs written by Chinese celebrities, along with comments and reactions to these microblogs. The

list of Chinese celebrities comes from the "Forbes China Celebrity 100," a representative list of 100 influential Chinese celebrities released by *Forbes* magazine. In addition, we included celebrities discussed on a prominent LIHKG thread (the Hong Kong version of Reddit; https://lihkg.com/thread/1767740/page/1) (*54*–*56*). We subdivided our sample into three groups.

State-conformists

Celebrities classified as "blue" on the LIHKG list, who have publicly expressed support for the Chinese government's positions regarding Hong Kong. In addition, celebrities who posted at least one of three well-known nationalistic messages on Weibo were coded as state-conformist. These messages include "Five-starred Red Flag has 1.4 billion flag bearers. I am the flag bearer!," "May the Motherland prosper forever," and expressions such as "I also support HK police" or "What a shame for Hong Kong." In total, 91 celebrities were coded as state-conformist. Individuals who follow these celebrities were also coded as state-conformists.

Nonconformists

Celebrities classified as "Yellow" on the LIHKG list, who have publicly expressed support for Hong Kong's prodemocracy movement or criticized government policies. In total, 46 celebrities were coded as nonconformist. Individuals who follow these celebrities were also coded as nonconformists.

Unclassified

Celebrities who were not categorized as either state-conformist or nonconformist based on the criteria above. In total, 55 celebrities were coded as unclassified. Individuals who follow these celebrities were also coded as unclassified.

The original LIHKG list categorized celebrities as either prodemocracy/yellow or pro-Beijing/blue. We rename the "pro-Beijing" group as "state-conformist" and the "pro-democracy" camp as "nonconformist." On Chinese social media, what might appear to be a "nonconformist" stance often represents the closest thing to a prodemocracy position that can exist. True prodemocracy content would quickly be censored, leaving only two visible groups: state-conformists who directly praise the government and nonconformists who remain silent on political matters (even when their fans pressure them to speak up). These nonconformists may freely express themselves on non-Chinese social media platforms but choose to avoid political topics on Weibo. We provide detailed categorization and validation in the Supplementary Materials.

We manually collected each celebrity's Weibo URL address. We gathered all Weibo microblogs published by these celebrities between 1 January 2019 and 31 December 2019, along with their followers' comments on these microblogs. For each post, we retrieved information including the post URL, post time, post content, number of comments, number of likes, commenter's name, comment content, comment time, and the number of likes each comment received. Scraping comments (and reactions to comments) required "scrolling down" to access those beyond the first page of each post. Our crawler mimicked this action and successfully collected up to 1000 comments per post before the Weibo server restricted further access. While comments were generally ordered chronologically, the algorithm prioritized those with a higher number of likes from other followers. In total, our dataset includes 23,433 celebrity microblogs and 8,574,075 fan comments, amounting to 8,597,508 posts, where we use the term "posts" to refer to both microblogs and comments. Further details of the data collection process, including examples, are provided in the Supplementary Materials.

Our primary analysis focuses on textual data from celebrities' microblogs and the replies from fans, who were identified as followers of the celebrities' accounts on Weibo. We used text-mining techniques to extract latent information from the content of microblogs and comments (*57*–*61*). A machine-learning classifier was applied to construct a nationalism score, providing a quantifiable measure of a microblog or comment's alignment with nationalist sentiments. We used the fine-tuned FastText model as the primary method, while XGBoost, a less accurate model for our dataset, produced similar results, supporting the robustness of the main findings. The nationalism score ranges from 0 to 1, with 1 indicating high confidence that the content is nationalist. To train the classifier, we manually labeled 9843 Weibo posts as either 1 (nationalist) or 0 (not nationalist), splitting the dataset into training (4921) and testing (4922) subsets. Further technical details on the nationalism score calculation are discussed in the Supplementary Materials.

We used Granger analysis to identify the lag between celebrities' (fans') postings and their impact on future posts (*62*). Granger analysis provides a data-driven empirical approach, eliminating the need for unverifiable assumptions. Table S1 in the Supplementary Materials presents the results of the Granger analysis on the lag. The findings indicate that celebrities' nationalist posts significantly influence fans' posting patterns after 2 days. Similarly, an increase in fans' nationalist comments is significantly correlated with celebrities' nationalist posts after 2 days. However, when the lag is set at 1 or 3 days, the relationship is not statistically significant at the $\alpha = 0.05$ level. Details of the Granger causality analysis process are provided in the Supplementary Materials.

Following the Granger analysis results, we set the lag at 2 days in the VAR regression. We averaged the nationalism scores by group (fans, celebrities, and subgroups of celebrities) and by day. We then used VAR to examine the statistical associations within the dynamic interactions between celebrities and their fans on Weibo (*63*–*65*). The VAR regressions used in the main analysis are formally expressed as follows

$$\begin{aligned}\mathbf{Fan}_t = {} & \mathbf{c}_f + \mathbf{A}_1\mathbf{Celebrity}_{t-1} + \mathbf{A}_2\mathbf{Celebrity}_{t-2} \\ & + \mathbf{B}_1\mathbf{Fan}_{t-1} + \mathbf{B}_2\mathbf{Fan}_{t-2} + \boldsymbol{\varepsilon}_t\end{aligned} \tag{1}$$

$$\begin{aligned}\mathbf{Celebrity}_t = {} & \mathbf{c}_c + \mathbf{A}_1\mathbf{Celebrity}_{t-1} + \mathbf{A}_2\mathbf{Celebrity}_{t-2} \\ & + \mathbf{B}_1\mathbf{Fan}_{t-1} + \mathbf{B}_2\mathbf{Fan}_{t-2} + \boldsymbol{\varepsilon}_t\end{aligned} \tag{2}$$

In the regression analyses, we assume that fans' (celebrities') nationalistic posts at time t are influenced not only by their own values from the previous 2 days but also by the celebrities' (fans') values during the same period.

The IRFs are applied to the two estimated equations to predict how Fan_t and Cel_t would vary over a 10-day range based on their past values. Specifically, the IRFs derived from the estimated VAR model offer a clear representation of the associations between fans and celebrities or among different subgroups. By analyzing these IRFs, we can observe how an increase of x units in celebrities' nationalistic sentiments cumulatively affects the nationalistic sentiments expressed by fans over time. ChatGPT[4.0] was used for proofreading by using the following prompt: "Is the following sentence grammatically correct?"

Supplementary Materials

This PDF file includes:

Supplementary Text
Figs. S1 to S22
Table S1
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