ORIGINAL ARTICLE

Foreign pop-culture and backlash: the case of non-fan K-pop Subreddits during the pandemic

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Abstract

Communication research establishes that when confronted with information contradicting their beliefs, people tend to 'backlash' by doubling down on their prior. Can international popular culture be the context of backlash? This paper analyzes two K-pop Subreddits (*r/WeHateKpop* and *r/Cringetopia*) populated by non-fans. A particular focus is given to their attitudinal changes upon being exposed to news stories about South Korea. I argue that a heavy dose of positive news stories about South Korea triggers non-fans as they associate K-pop with the country. This exposure leads to backlash, resulting in increased engagement with the posts critical of K-pop in the two Subreddits. I present a series of econometric evidence strongly supportive of this argument. The paper is a rare large-N study on the non-fans of K-pop. It offers implications for cultural economics, demonstrating how seemingly irrelevant news stories can have profound effects on individuals' engagement with foreign cultures.

Keywords K-pop · Reddit · Non-fan · Difference-in-difference

JEL Classification D91

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1 Introduction

Do positive news stories about a foreign country always elevate its public image? Extant literature establishes that public opinions about a foreign country, society, culture, or national image are strongly affected by the way the country is portrayed in the media (e.g., Manheim & Albritton 1984; Semetko et al., 1992). The studies commonly find that the country's visibility in the media (and the topics that news stories cover for it) can shape and improve positive public attitudes toward it. Media portrayal of a country, the traditional studies assume, constitutes the public's perception of it.

But as the coverage of a 'foreign culture' by traditional domestic media outlets is increasingly outpaced by digital and social media, the premise of this intuition grows untenable. Often, the public has already been exposed to the foreign culture and has formed opinions about it by the time it finally reaches, say, a prime-time TV show. The literature, however, has not effectively highlighted this new pattern of intercultural communication. Aside from the studies on international conflict and terrorism (e.g., Cavari, 2013), we are generally agnostic as to how media coverage of a foreign country or culture would affect these individuals' existing opinions. If, for instance, a foreign country is presented in a positive light to individuals who are otherwise strongly skeptical of its attributes such as the popular culture, would they change their opinions? Or would they double down on their negative views of them?

One clue can be gleaned from the research on social and political behaviors as well as behavioral and cultural economics literature, particularly the 'backlash' studies pointing to the effect of a (dis)confirmation bias. When met with evidence contrary to their personal beliefs, individuals tend to not only reject it (Rabin & Schrag, 1999) but also band together with their identity groups and resort to a counterargument (Taber & Lodge, 2006). A positive media portrayal of a foreign country may, therefore, backfire when the individual has already formed a strongly negative opinion about it. Furthermore, if individuals associate a foreign popular culture with its country of origin, synthesizing the national image and the backlash literature leads to the expectation that the positive news on the country would only strengthen the existing negative views on its popular culture as the news challenges their pre-formed belief.

Despite this straightforward expectation, a clear theorization and robust empirical test of the cultural interactions between national images and the backlash has been rare, if any. Filling this glaring lacuna can thus help expand the horizon of traditional social communication and cultural economics research in the rapidly evolving empirical landscapes of cross-cultural exchanges.

As one such attempt, this paper studies online non-fan discussions on K-pop (Korean popular culture, particularly music) during the Covid-19 pandemic. I focus on two online forums (Subreddits *r/WeHateKpop* and *r/Cringetopia*) that are unequivocally skeptical of K-pop and its fandom. Subreddit is an empirical domain suitable for the present research given that its anonymity "[allows] users to partake in unfiltered conversations" (Lu et al., 2019, 9) while each Subreddit
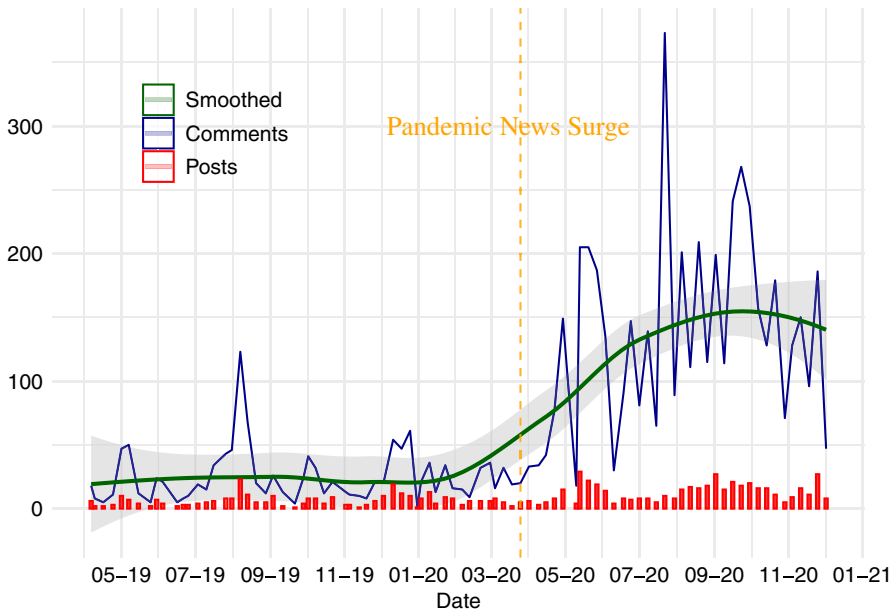
Fig. 1 Number of posts and comments in *r/WeHateKpop* over time. Plotted are the number of comments (spiky line) and posts (bars) as well as a moving average of the number of comments in *r/WeHateKpop*

environment offers discussions focused on a specific topic in a community-like setting. Compared to traditional opinion surveys and experiments, analyzing social media content presents a distinctive analytical advantage—reducing the possibilities of measurement errors and selection bias stemming from human interactions and priming (Klašnja et al., 2017). Recent studies find that these advantages—anonymity and communality—are particularly pronounced in Reddit (Kaufman et al., 2020; Manikonda et al., 2018) although the online forum remains largely "understudied" (Guess & Lyons, 2020, 23).[1]

Of particular interest is whether and how the discussions in these Subreddits were affected by the sudden influx of positive media portrayals of South Korea in the early days of the global pandemic. The participants of these Subreddits ('Redditors') are uniformly skeptical of K-pop and, especially, the K-pop fandom. They thus offer a pertinent empirical ground to explore how those with negative preformed opinions about a foreign culture react to news stories challenging their priors. I argue that a sudden increase in the number of news stories invoking South Korea in a positive light irritates Redditors (or 'non-fans') because they would perceive such news as vindicating K-pop. Such irritation, in turn, brings about their backlash, measured by the increase in the number of comments to anti-K-pop posts.

Figure 1 offers a cursory look at how the number of comments changed over time in one of the Subreddits (*r/WeHateKpop*). Although the number of 'posts' does not

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[1] An example in the economic literature is Bohren et al. (2019), who study a sensitive topic—gender discrimination—on an online platform very similar to Subreddits.

appear to vary much over time (the bar graph at the bottom), that of 'comments' did. The timing of the 'Pandemic News Surge' (the vertical dashed line) appears to be a 'knee point,' at which the number of comments took on a clear upward trend. The figure suggests that the intensity of the redditers engaging in the anti-K-pop posts increased with the 'treatment.' This descriptive data examination warrants a deeper and more systematic investigation.

The paper consists of four sections. Following this introduction, the second section develops the backslash hypothesis drawing on the extant literature on behavioral economics, communication, and K-pop. The third section details the research design as well as the result of empirical analysis. The last section summarizes the findings and briefly discusses their implications.

2 Backlash and non-fans

2.1 Backlash literature

Studies on international communication and cross-cultural exchange maintain that a positive portrayal of a foreign country in media enhances the public's perception of it. Green et al. (2010), for example, report that exposure to positive news about China and the Olympics Games enhanced the national image of China. Researchers also find that celebrities (Kim et al., 2019) and cuisine (Kim et al., 2012) of a country can promote its national image through TV drama appearances. Likewise, Zhang et al. (2012) suggest that positive news translates into positive national images of emerging markets. Perhaps a more microfoundational explanation of this empirical regularity comes from the 'contact theory,' a body of literature positing that positive human contacts (information) lead to positive group perceptions (Alrababa'h et al., 2021; Rao, 2019). Therefore, it is expected that more positive news about foreign countries drive up the more positive public opinions about them.

These studies on the positive country image effect, however, tend to assume away one key individual-level feature: heterogeneity in the pre-formed opinions about particular countries. Behavioral economics literature suggests that this assumption might be empirically untenable. As Kranton and Sanders (2017) report, people tend to make biased assumptions about out-groups. Regardless of the level of their knowledge about a foreign country (Hurwitz and Peffley, 1987), they often hold a strong pre-formed opinion about it, so much so that they affect their economic behaviors such as purchasing goods imported from those countries (Roth & Diamantopoulos, 2009).

Indeed, behavioral economics and business literature documents that positive news about a foreign country may not necessarily generate a positive national image for the individuals who have already formed a negative opinion about it. Receiving information contrary to their pre-formed opinions may lead to settling the discrepancy *within* their worldviews, without altering their opinions (Sadler, 2021). Roh et al. (2015) also find that partisan backlash leads conservatives to be *more*

supportive of conservative efforts.[2] Likewise, social and political communication research establishes that if new information contradicts the pre-formed opinions, backlash ensues: when presented with evidence against their beliefs, individuals refuse to accept such corrections and instead try to solidify their previous beliefs (e.g., Nyhan & Reifler 2010).

Such a reaction is explained by 'motivated reasoning'—people desire to arrive at their preferred conclusion and would choose information selectively and strategically to justify it (Kunda, 1990). Important to note is that, often occurring unconsciously and emotionally, a backlash does not only include rejecting the uncomfortable information. People may take extra steps and engage in deliberate actions to push back on the argument. Examples include counter-arguing and seeking out other information that do confirm their pre-formed beliefs (Taber & Lodge, 2006), a course of action that they feel completely rational (Epley & Gilovich, 2016) and thus satisfying. A positive news coverage on a country could, therefore, provoke negative reactions from the individuals already critical of it. Recent studies suggest that online community environments reinforces these negative reactions as backlash helps build a solidarity among like-minded individuals (Edy & Risley-Baird, 2016).

2.2 The empirical context: backlash against K-pop

The empirical regularities found in the backlash literature are aptly applicable to the online communities structured around the disapproval of K-pop. In the wake of the Covid-19 pandemic, the conditions to provoke a backlash against K-pop were ripe in online forums, particularly those that explicitly identified with negative opinions about the genre and its fandom. These conditions are (1) online space where homophily is warranted; (2) individuals with potentially negative opinions about South Korea primarily because of K-pop; (3) the influx of news stories highlighting South Korea in a positive light. A couple of good examples can be found in *Reddit.com*.

2.2.1 The non-fan online forums

Reddit.com is a collection of online threads maintained and developed through user communities—'Subreddits.' Each Subreddit has a specialized topic. As of December 2019, there are about 430 million monthly active users worldwide. At least 130,000 Subreddits are considered 'active' according to Reddit's official statistics (https://www.redditinc.com/). More than half of the entire traffic comes from the USA whereas no other country is the origin of more than 6% of the traffic. It is safe to presume that the Reddit contents are by and large 'American.'

Two Subreddits are of particular interest in this paper. The first is *r/WeHateK-pop*.[3] As the Subreddit title implies, its purpose stated in the official description is to share "negative opinions toward Korean pop music, its fans and idols." It is a relatively small community with about 1600 subscribers as of December 2020.

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[2] Leeper and Slothuus (2014) and Guess and Coppock (2020) offer extensive surveys of the literature, although the latter's empirical analysis challenges it.

[3] A snapshot example is provided in Appendix Fig. 7.

The Subreddit offers a window through which how an online forum closely knitted around a specific purpose—an explicit expression of anti-K-pop—can be observed. With an obvious ontological basis, extreme homophily is warranted in this Subreddit. In fact, the average 'probability of upvote'[4] of the posts is 96.5%.

The other Subreddit, *r/Cringetopia*, is about any public moment that users deem socially embarrassing (or 'cringe-worthy') where K-pop is one of the most consistently discussed subjects. This Subreddit has more than one million subscribers. Thus, compared to *r/WeHateKpop*, *r/Cringetopia* offers an empirical ground where a more diverse group reacts to K-pop, though still in an unequivocally skeptical tone. Posts rarely ignite a controversy as the mean probability of upvotes is 95.8%. The audience, in other words, is overall in agreement with the posters depicting K-pop and its fandom as cringe-worthy.

Non-fans' motivation to flock to these Subreddits can be characterized as anxiety. Non-fans find K-pop distasteful. Attributes of K-pop such as soft masculinity are perceived to be a threat to their worldview (Lee et al., 2020), which they might find too risky to express publicly. The desire to protect themselves from this threat motivates them to seek a safe environment (Roseman & Evdokas, 2004). Online forums like the two Subreddits offer such a safe space where the anxiety "serve[s] to coordinate responses to circumstances that individuals confront" (Gadarian & Albertson 2014, 134). Non-fans communicate with each other in these Subreddits on the common threats they encounter every day, be it K-pop stars whose mannerisms they deem unconventional (Song & Velding, 2020) or the 'cringe' moments of K-pop fan activities that they find disturbing.

2.2.2 Negative country image of South Korea via K-pop

Non-fans of K-pop are likely to have developed negative opinions about South Korea, but not necessarily because they have systematic knowledge about the country per se. Given the US public's limited knowledge of foreign countries (Iyengar et al., 2009), it is plausible to assume that the great majority, if not most, of non-fans otherwise have little to no understanding of South Korea as a foreign country. Topics related to South Korea receive "only a cursory and shrinking treatment in major U.S. media outlets" (Slack, 2010, 21).

Instead, the negative country image emerges primarily from the non-fans' natural tendency to associate the country with the cultural phenomenon they abhor. Although the public usually constructs a holistic image of a foreign country even when they do not know much about it (Holsti, 2004; Kertzer & McGraw, 2012), such an image construction does not occur in a vacuum. The foreign 'objects' that they run into helps shape their understanding of the country of its origin. The business literature on country-of-origin (COO) establishes that individuals can form an opinion about a country through their everyday items that originated from it (White,

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[4] A metric showing if readers find a particular post agreeable by voting up as opposed to voting down. Given that not every reader votes either up or down, an alternative way of showing this agreeability is a net difference between positive and negative votes, which is usually presented next to the title of a post (marked as '1' in Fig. 7).

2012; Lee & Lockshin, 2012). Similarly, Balmas (2019) reports that public defines a country with the personality of its prominent national figure. Therefore, it is plausible to assume that just as consumers develop an image of a foreign country through their experience of a certain product imported from it, coming in contact with—and reacting to—K-pop helps the non-fans cultivate their slant on South Korea. Non-fans 'localize' South Korea, a country, into K-pop, an everyday cultural encounter.

In effect, circumstantial evidence pointing to non-fans associating K-pop with Korea is found in one of the Subreddits (*r/Cringetopia*) analyzed below. In all K-pop-related comments, the word 'Korean' was the most frequently invoked word (Fig. 8). Similarly, Fig. 9 presents the weekly number of comments (log-scaled) that include the word "Korea" (red) in comparison with those that do not (grey). Again, 'Korea' is consistently used in many of the non-fan K-pop discussions.

The specific contexts in which 'Korea' is invoked in the comments may vary significantly, but their tones are universally negative in these non-fan Subreddits. Perhaps one notably frequent context in which Korea is invoked can be encapsulated into the term 'Koreaboo'—"K-pop fan who loves everything about Korea... without really knowing much about Korea" (King-O'Riain, 2020, 16). Non-fans often try to affirm posts skeptical of Koreaboos by making comments about negative aspects of South Korean culture and society. For example, Korea is depicted as a "toxic attention-seeker" in a comment to a post lamenting about the "Korean Hallyu wave." In a different post, to a post on how K-pop fans 'stalked' local Korean Americans allegedly as an extension of their fan activity, a Redditor cynically commented "Koreans don't exist [sic] delete this." Redditors in these two Subreddits, in short, bring up 'Korea' as an extension of their skepticism of K-pop.

2.2.3 The positive portrayal of Korea as a trigger

During the early days of the Covid-19 pandemic, South Korea has often been cast in the American news media as an exemplary case effectively dealing with the crisis. This positive news coverage of South Korea, according to the backlash thesis applied to the non-fan Subreddits developing a negative image of the country, would not sit well with the non-fans.

With the global pandemic unfolding in early 2020, most domestic and international news stories in the US media were dedicated to Covid-19 in 2020. Hart et al. (2020) find that about 40% of all newspaper and network news stories in the first half of the year were about the virus. The pandemic was an overwhelmingly salient issue. Against this backdrop suddenly emerged the vociferously positive media coverage of the South Korean 'success' story. South Korea brought the outbreak effectively under control in early March, which drew extensive attention from the global media, but particularly from the outlets in the USA where the situation was spiraling out of control (Fig. 2). As early as mid-March, the US media started referring to the South Korean case as a model where lessons should be drawn (e.g., Terhune et al. 2020), often contrasting it with the dire situation at home (e.g., Fisher & Choe, 2020). By October, the country became effectively a go-to benchmark to highlight the US policy failure of handling the pandemic (e.g., Rogin 2020).
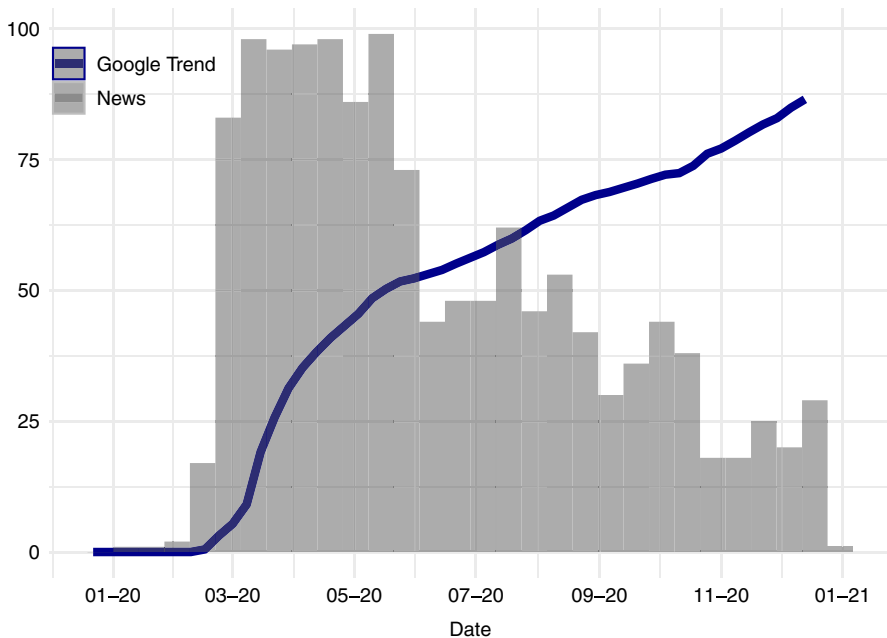
Fig. 2 News Coverage and Google Trend of Covid-19 in South Korea. Plotted are the cumulative Google Trend of the key word combination of 'South Korea' and 'Covid' (solid line) and a frequency distribution of news stories covering South Korean Covid-19 situations (bars). The data for the news stories are obtained from *LexisNexis*. The news outlet sources include CNN, ABC, NBC, and the New York Times

While the trend is indisputable, it is difficult, if possible, to pinpoint when and to what degree the Redditors of the non-fan Subreddits were aware of these news stories. Public health policies are not directly discussed in these Subreddits because topic relevance is fairly strongly enforced (Fiesler et al., 2018) and they are neither about K-pop nor intuitively 'cringeworthy.' Nonetheless, it is plausible to assume that the Redditors were not much different from the general public in receiving the pandemic news because the news surge was not likely confined to traditional news outlets. For example, the number of posts on Korean pandemic policies in two prominent news Subreddits frequently referenced in the non-fan Subreddits, *r/news* and *r/worldnews*, runs in parallel with those in the mainstream news outlets (See Fig. 10). This ubiquity of the 'news surge' bolsters our confidence in the feasibility of Redditors, just like the general public, being exposed to the influx of positive news about South Korea.

Non-fans would find the news coverage of South Korea starkly inconsistent with their priors. The positive portrayal of South Korea directly challenges their previously-held negative perception of the country. Given that individuals are usually sensitive to the valence of news coverage of the subject they othernize (Graf et al., 2020), it is unlikely that the non-fans exposed to the news miss this positive tone. Instead, given the association they make between K-pop and South Korea, it would appear to the non-fans as though the news endorsed K-pop, which they cannot tolerate. As the backlash thesis predicts, the positive news activates their "hot cognition"

(Redlawsk, 2002) which drives them to look for information that could reinforce their existing understanding of K-pop. Engaging with online hate speech, indeed, is not an uncommon way for individuals to process the real-world 'trigger' event (Saleem & Derek, 2018). As such, the Redditors triggered by the news would take comfort in the two Subreddits that offer the 'right' information.

Of particular importance here are comments made to posts. A post initiates a comment thread usually by publishing content including visuals. Only a small number of highly motivated Redditors make posts (Richterich, 2014) because of the mental and physical costliness of creating content. The way in which the great majority of Redditors engage with the content is by making comments on these posts. Researchers find the Subreddit comments to be more revealing of candid personal opinions than other social media content such as tweets (Manikonda et al., 2018). Reddit comments are hence used widely as the primary unit of analysis when studying sensitive topics in medical research (Kaufman et al., 2020; Yao et al., 2020). Given that the non-fans self-select into the Subreddits, however, the actual contents of the comments would not vary much: they would be consistently negative and critical of K-pop regardless of a 'trigger' event.[5] Therefore, the non-fans' increased engagements with the Subreddits are likely to be in the *number* of comments, an example of which can be seen in Appendix Fig. 7 (marked as '2').

In short, it is reasonable to expect that the non-fans irked by the news stories of South Korean flock to the Subreddits to engage in the posts that comfort them by making comments. The following hypothesis pointing to this backlash phenomenon is proposed:

- H_1: The exposure to a positive media portrayal of South Korea *increases* the number of comments on the non-fan posts.

3 Research design and empirical analysis

The test of the hypothesis is twofold. First, it is tested on *r/WeHateKpop* using an interrupted time-series model to demonstrate that the number of comments surged significantly as a result of the influx of positive news on South Korea. The data takes the form of a single-panel time series where the number of comments in the entire Subreddit is observed weekly. Second, the same hypothesis is tested using the data from *r/Cringetopia* with a simple difference-in-difference model to address the issue of a potential confounder, which is not feasible in the first analysis.

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[5] The non-variability would be due in part to Reddit's regulation that limits extreme hate speeches. The result of sentiment analysis of the posts indicates that trend of negativity is more or less consistent with that of the number of comments, though without statistically significant differences between pre-and post-treatment periods. See Fig. 13 for detail.

3.1 Treatment: the news surge

The 'treatment' that is assumed to have made a difference in the non-fan behaviors is the influx of positive news stories about South Korea. Given the sudden rise in the volume of media attention to the South Korean 'success' story, it is plausible to assume that Americans' exposure to a positive portrayal of South Korea increased drastically in March 2020. Specifically, I set the fourth week of March (24 March 2020) as the point that demarcates the differential exposures. This decision is made considering three factors: a) the earliest time in the data at which a positive news story on South Korea's handling of the Covid-19 situation was February 27; b) in the third week of March, the amount of such news stories climbed up dramatically while the case numbers decline precipitously; and c) the official pandemic itself was announced to start two weeks before the treatment period (11 March 2020) according to the US Center for Disease Control and Prevention.[6] About a month from the first news and the week after the sudden increase in the amount of news—March 24 (fourth week of March)—seems to be a reasonable point by which many Redditors had come across the 'uncomfortable' news stories. The treatment week is also set two weeks apart from the beginning of the pandemic, offering an opportunity to check if the 'pandemic shock' is compounding the effect of the 'Korean news shock.'[7] The weeks before this treatment, in other words, are considered a pre-treatment period, and those after the week, a post-treatment period. The sudden change in the media coverage pattern is in line with the cumulative weekly Google Trend statistics in the USA (Fig. 2), which is known to be indicative of the social salience of a topic (Jonathan, 2013).

3.2 Data and analysis

All posts and their comments are retrieved using the R package `RedditExtractoR` (Rivera, 2019). While the Reddit API regulation allows no more than 500 comments (i.e., text data) to be extracted for each post, the parameter data—e.g., the *number* of comments—as well as the text data for posts were available in its entirety. The data retrieved cover the period that starts when K-pop-related posts started appearing regularly in the Subreddit and ends in the first week of December 2020. For *r/WeHateKpop*, this is from April 6, 2019, through December 2, 2020. In the case of *r/Cringetopia*, the data covers the period between December 5, 2018, and

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[6] US CDC webpage: https://www.cdc.gov/museum/timeline/covid19.html#:~:text=March%2015%2C%202020,the%20spread%20of%20COVID%2D19.

[7] If it was indeed the beginning of the pandemic itself, not the Korean news surge, that largely affected the Redditor behavior, setting the treatment timing earlier should capture that effect. As shown in Fig. 6, however, alternative treatment timings earlier than the benchmark lead to insignificant results. Likewise, pushing the treatment period back by 10 weeks such that it captures an alternative shock, the Black Lives Matter protests, does not yield significant results, providing another layer of confidence in the treatment timing decision.

December 9, 2020.[8] This temporal coverage offers substantially long pre- and post-treatment periods that are appropriate for testing H_1.

3.2.1 *r/WeHateKpop*

The following ordinary least squares (OLS) model reflecting a simple interrupted time series model can be estimated (Cook et al., 2002) to test the first hypothesis:

$$\ln(\text{number of comments})_t = \ln(\text{number of comments})_{t-1} + \beta_1 \mathbf{D} + M + \mathbf{X}_t + \varepsilon_t, \tag{1}$$

where *ln(number.of.comments)$_t$* is the logarithm of the total weekly number of comments. To avoid losing the observations of zero comments, 1 is added to all observations (i.e., ln(number of comments + *1*)). $\mathbf{D}$ is a dummy variable indicating the post-treatment period while ln(number of comments)$_{t-1}$ is a lagged dependent variable to account for possible serial correlations in the error term. M is a month fixed effect, $\mathbf{X}_t$ is a vector of covariates including the number of posts and three variables counting the number of times word variants of 'Korea,' 'fan,' and 'stan.' These variables capture the possibility that invoking the country or mentioning fan activities has any independent effect in attracting comments. Two additional variables—time trend (time) and number of weeks that have elapsed since the treatment (time since the treatment)—to account for any remaining temporal dependence in the error term are also included as covariates. ε_t is the error term. For H_1 to be supported, we should observe β_1 significantly positive.

Table 1 reports the OLS estimates of Eq. (1). The benchmark estimates (Column one) are in line with H_1. The positive and significant coefficient suggests that the number of comments increased with the influx of positive news on South Korea (treatment) even after controlling for other factors. Columns two and three imply that this effect is not sensitive to different specifications regarding the temporal dependence in the data, namely, the inclusion of the lagged dependent variables. Appendix Fig. 11 reports event data analysis estimates equivalent to the benchmark. Again, the coefficients of the month dummy variables are consistently and significantly positive only after the treatment while almost entirely indistinguishable from zero before the treatment. This simple analysis, thus, lends strong support to H_1.

As a robustness check, Fig. 3 reports the estimates of Bayesian structural time series analysis.[9] The result strongly corroborates the benchmark OLS estimates. The pointwise estimates (the upper panel) are significantly positive only after the treatment, closely resembling Appendix Fig. 11. The cumulative effect plot (the lower panel) more intuitively demonstrates this drastic treatment effect: there was not a meaningful trend in the number of comments before the treatment whereas a consistent increase in the number of comments is found in the post-treatment period.

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[8] Given many days of no post/comment, *r/WeHateKpop* data is weekly whereas the analysis of the larger Subreddit, *r/Cringetopia*, uses daily data.

[9] See the Appendix Section for detailed discussions on the model.

Table 1 Interrupted time-series analysis, *r/WeHateKpop*

	(1) Benchmark	(2) W/O LDV	(3) Two LDVs
ln(comments)$_{t-1}$	0.126		0.141
	(0.123)		(0.130)
ln(comments)$_{t-2}$			−0.078
			(0.108)
Treatment	1.170**	1.290**	1.234**
	(0.326)	(0.292)	(0.356)
Fan mentions	0.197**	0.196**	0.197**
	(0.048)	(0.048)	(0.052)
Stan mentions	0.145**	0.155**	0.155**
	(0.056)	(0.055)	(0.062)
Korea mentions	0.285	0.308	0.272
	(0.203)	(0.217)	(0.210)
Time	0.002	0.002	0.001
	(0.007)	(0.006)	(0.007)
Time since the treatment	0.008	0.012	0.011
	(0.013)	(0.012)	(0.014)
Num. Obs.	88	89	87
R2	0.715	0.710	0.713
AIC	178.2	178.9	178.1
BIC	200.5	198.8	202.8
Log.Lik.	−80.093	−81.450	−79.052

*$p < 0.1$, **$p < 0.05$ The dependent variable is the daily number of comments in the Subreddit. The results for the month dummy variables are abbreviated to spare space

3.2.2 *r/Cringetopia*

While the analysis of the data from *r/WeHateKpop* offers strong evidence supporting the hypothesis, one reasonable methodological concern can be raised: An unobserved confounder might affect both the treatment and the outcome variable, the number of comments. An example of such a confounder is the global pandemic itself which might have generated both positive news coverage of South Korea and anti-Asian sentiment. The anti-Asian sentiment, then, could have driven up the number of anti-K-pop comments regardless of the Korean news surge. Promptly after the outbreak, political elites were able to "activate" anti-Asian sentiment in the USA (Reny & Barreto, 2020). Online space, particularly social media outlets, became the platform where this sentiment materialized into hate speech (Chou et al., 2021). It is possible that what Fig. 3 represents is the pandemic-induced anti-Asian sentiment in the Subreddit, not specifically the news about South Korea, driving up the number of anti-Kpop comments. In fact, casually ascribing K-pop to "Asian stuff" is not
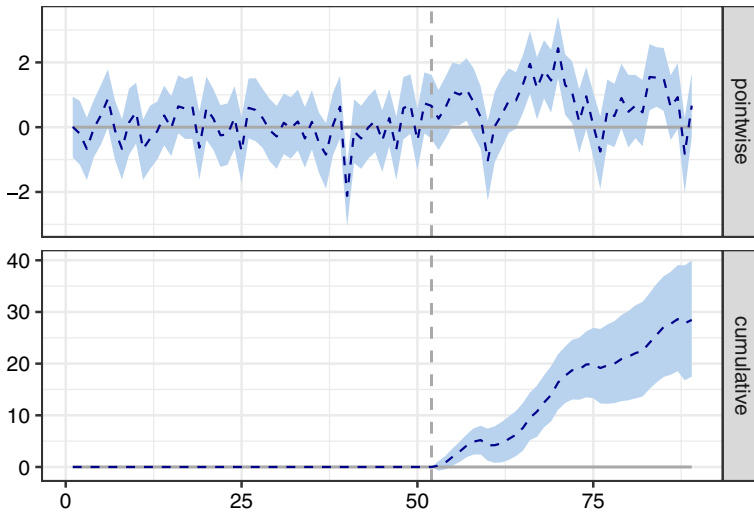
Fig. 3 Bayesian structural time series analysis. Plotted in the top panel are pointwise estimates of the difference between projected and actual number of comments in r/WeHateKpop using a Bayesian diffusion-regression state-space model (Brodersen et al., 2015) with a 95% confidence interval. Presented in the bottom panel is a 'cumulative impact plot' that represents the cumulation of the treatment effect over time with a 95% confidence interval. The dashed line is the timing of the treatment

uncommon among the non-fans (Lee et al., 2019), 181. As far as this concern is warranted, a rigorous test of H_1 is in peril.

One way to adjust for this possible unobserved confounder rests on the use of a control. If a control is not exposed to the treatment while still affected by the confounder, the difference between the control and the treated in terms of their changes upon the treatment (difference-in-difference) would be the true effect of the treatment devoid of the influence of the confounder (Angrist & Pischke, 2009). In other words, Subreddit comments that might be affected a) by the pandemic-induced anti-Asian sentiment, but b) not by the Korean news surge can serve as a 'control group.' Unfortunately, obtaining such a control is not possible using the data from *r/WeHateKpop* as all the posts are by definition about K-pop and likely be affected by the exposure to the media portrayal of South Korea.

In this respect, *r/Cringetopia*, a Subreddit with a much wider scope and more diverse topics, can be a fertile ground for finding a useful control for K-pop-related comments.[10] Among many candidates, I chose the comments to the posts on China or Chinese ('China' hereafter) for three reasons. First, the posts in China are available for the great majority of weeks where K-pop-related posts are also available such that time-variant unobserved idiosyncracies can be adjusted for through time-fixed effects. Second, the trends of China- and K-pop-related comments are largely unrelated up to the point of the treatment, addressing the concern over a pre-trend leading to a spurious inference (Freyaldenhoven et al., 2019). Third, and most importantly, 'China' posts are unlikely to have anything to do with the media portrayal of

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[10] In May 2022, r/Cringetopia became a 'private' community where public access is unavailable.
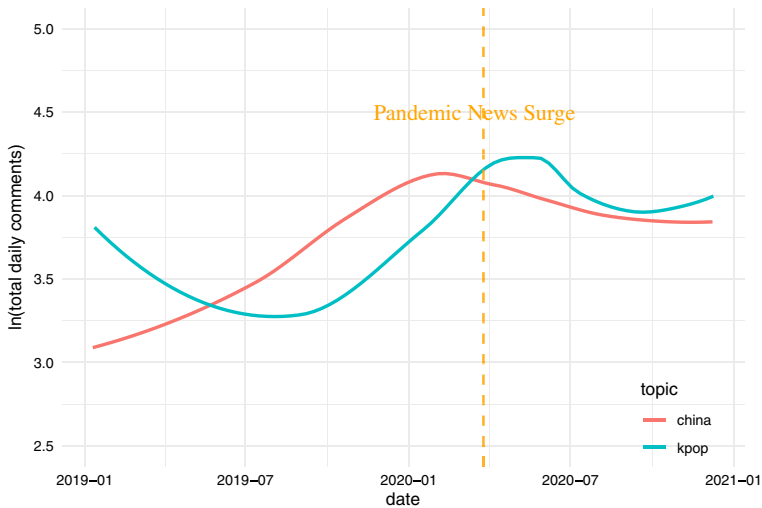
Fig. 4 Trend of Comments on Kpop and China Posts in *r/Cringetopia*

South Korea (treatment). But they are very much likely affected by the pandemic-induced anti-Asian sentiment as the word 'China' was frequently used by politicians as a trigger (Reny & Barreto, 2020).

Figure 4 illustrates the descriptive trend of comments on 'Kpop' and 'China' posts in *r/Cringetopia*. Before the treatment, there were usually more comments on 'China' posts than those on 'K-pop' posts.[11] This trend is altered with the treatment, the pandemic news surge, after which the latter outnumbers the former consistently.

A more rigorous empirical test would systematically demonstrate that a) the number of comments to the K-pop-related posts in *r/Cringetopia* increased with the Korean news surge and b) this increase was significantly larger than that in the number of comments to the 'China' posts in the same period while controlling for other factors affecting the comments. This difference represents the amount of the effect of the Korean news surge on the number of comments after adjusting for the potential confounder or simply, 'average treatment effect on the treated' (ATT) (Athey & Imbens, 2006).

The difference-in-difference (DiD) estimates systematically capturing this difference in trend are obtained using the following model:

$$\ln(\text{comments})_{it} = \beta_1 K - \text{pop}_{it} + \beta_2 \text{treatment}_{it} + \beta_3 K - \text{pop} \times \text{treatment}_{it} + \mathbf{X} + m + \varepsilon_{it}, \tag{2}$$

where the dependent variable is the logarithm of the daily number of comments ($\ln(\text{comments})_{it}$). The quantity of interest is the coefficient of the interaction term between K-pop and *the treated* at time t, β_3, which is the ATT. K-pop is an indicator of whether a post mentions 'K-pop' (i=1) or 'China' (i=0), or their word variants.

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[11] More detailed data is reported in the Appendix Fig. 12.

Table 2 Difference-in-difference model, r/cringetopia

	(1) Baseline	(2) Benchmark	(3) Week FE	(4) Subscribers	(5) N.B.
Treatment	0.191	0.873	0.523	0.539	1.155**
	(0.197)	(0.575)	(0.804)	(0.597)	(0.570)
Kpop	−0.319	−0.817**	−1.366**	−0.893**	−0.775**
	(0.253)	(0.319)	(0.465)	(0.359)	(0.359)
Treatment × Kpop	0.548*	0.746**	1.095**	0.680*	0.734*
	(0.323)	(0.364)	(0.418)	(0.381)	(0.396)
ln(No. of total comments)		−0.043	−0.224	− 0.076	− 0.743**
		(0.252)	(0.275)	(0.256)	(0.193)
ln(No. of total posts)		0.174	0.388	−0.261	0.841**
		(0.250)	(0.371)	(0.667)	(0.175)
ln(No. of cumul. comments)$_{t-1}$		−1.022**	−1.371**	− 1.283**	− 0.977**
		(0.296)	(0.582)	(0.370)	(0.287)
ln(no. of subscribers)				9.998**	
				(3.849)	
Num.obs.	407	366	366	359	368
R2	0.023	0.120	0.344	0.136	
AIC	1511.1	1364.6	1417.0	1340.6	4250.7
BIC	1531.1	1485.5	1850.2	1464.9	4371.9
Log.Lik.	−750.529	−651.275	−597.490	−638.300	−2094.365
Month fixed effect	✓	✓	✓	✓	✓

*$p < 0.1$, **$p < 0.05$ OLS estimates with robust standard errors in the paranetheses. The dependent variable is the daily number of comments (logged) in *r/Cringetopia*. The result for the month dummy variables are abbreviated to spare space

treatment is an indicator for the pre- and post-treatment period, where the former is coded as zero and the latter, one. For H$_1$ to be supported, β_3 should be significant and positive, indicating that the treatment increased the number of comments to the K-pop posts much more than it did to the China posts.

X is a vector of covariates including ln(all comments)$_t$, ln(all posts)$_t$, and ln(old comments)$_{t-1}$. The first two represent the number of all comments and posts in the entire Subreddit to account for the overall atmosphere in the virtual community that would affect the probabilities of both a post to be created and a comment to be made to it. Likewise, a lagged value of cumulative comments (old comments) is to control for the path dependency in the online discourse. Since the characteristics of a current post are heavily affected by how the audience engaged in similar posts in the past (Massachs et al., 2020), the inclusion of this variable in the model is expected to adjust for the theme- and post-specific properties that could have a resilient effect on the number of comments over time. Logarithms are used for these variables given the wildly non-normal distributions of the data. ϵ and m are the error term and month-fixed effect, respectively. Because the number of the clusters of observations
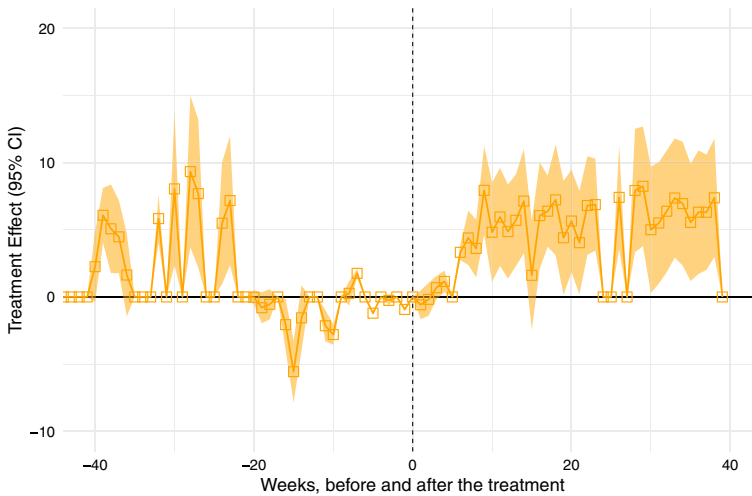
Fig. 5 Event study analysis for the benchmark effect. The horizontal axis represents the time to and from the treatment while the vertical axis represents the treatment effect (λ in Eq. (3)). The dots are point estimates and the band is 95 % confidence intervals. The vertical dashed line indicates the time of treatment

(posts) in each week is very small in the data and there are weeks and days where K-pop (China) posts are entirely absent, a month-fixed effect is appropriate as the benchmark, although using a week fixed effect does not alter the result as shown below.

Column 2 of Table 2 presents the OLS estimates using the DiD model (Eq. (2)), which lends strong support to H_1. The coefficient for the interaction term between K-pop and the treatment (K-pop × treat) is positive and significant, indicating that after the treatment, the number of comments on the K-pop posts increased significantly more than those for the control ('China' posts) did.

Following the standard practice in the literature on DiD (e.g., Roth et al., 2022), an event study analysis is conducted to visually represent the benchmark treatment effect. Figure 5 plots coefficients of the interaction terms between the treated and the time dummy variables (λ in Eq. (3)).[12]

$$\ln(\text{comments})_{it} = \beta_0 + \lambda K - \text{pop} \times \Sigma \text{Time Dummy}_t + \mathbf{X} + \varepsilon_{it}, \qquad (3)$$

The figure runs in parallel with Fig. 4, confirming that the number of comments to the 'Korea' posts increased more than that to the 'China' posts after the treatment as the estimates remain mostly above zero on the right-hand side of the figure. More importantly, the trend in the pre-treatment period, particularly during the weeks immediately before the treatment, seems to be largely insignificant, confirming that the benchmark finding is not driven by a pre-trend.

Not only is the treatment effect significant, it is robust to several alternative empirical scenarios. The first column of Table 2 indicates that the benchmark result

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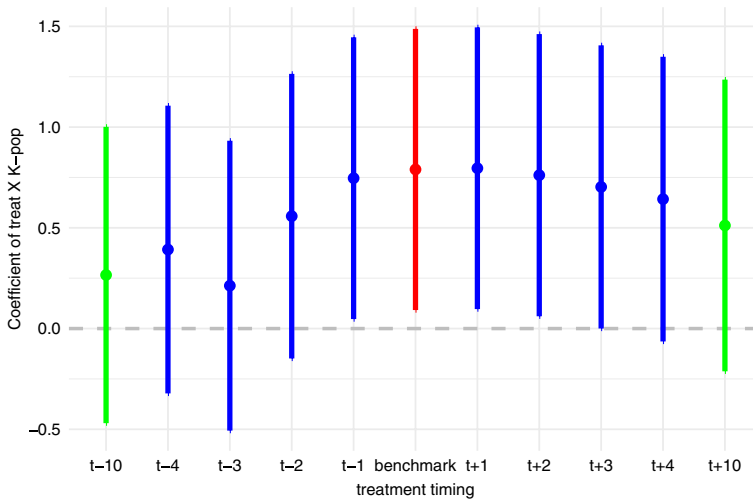[12] The same covariates used in the benchmark model are applied.

Fig. 6 Alternative treatment timings

is retained when all covariates are dropped.[13] The finding is unlikely a statistical artifact of controlling for factors that are potentially post-treatment variables or 'over-controlling.' The third and fourth columns of the table report the estimates when additional covariates such as another layer of fixed effect (week dummy variables) and the number of total subscribers to *r/Cringetopia* are added to the benchmark model. Including the latter in the model controls for not only the total possible number of comments but also the time trend in the dependent variable because the number of subscribers steadily increased over time. Again, the benchmark result is hardly altered, pointing to its robustness to these alternatives. The fifth column of the table reports the result using an alternative estimator, negative binomial (NB) regression. Here the dependent variable is the raw number of comments, not the logarithm. The result indicates that the benchmark estimate is robust to this alternative estimator as well.

In addition, given that the dividing line between the pre- and post-treatment periods is not necessarily 'sharp' and the exact moment of exposure to the news surge could vary slightly among Redditors, it is important to check how sensitive the benchmark estimates are to alternative treatment timings. This 'placebo' test using different treatment periods offers additional confidence in the fact that the benchmark result is not simply a product of the current research design (Schnabl, 2012; Roth et al., 2022).

Figure 6 reports the difference-in-difference (the coefficients of (treat × Kpop)) with 95% confidence intervals when alternative timings of the treatment are applied. At the center is the benchmark treatment for comparison whereas on the left and

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[13] Similarly, when the covariates are dropped one-by-one from the model, the benchmark result remains unchanged.

Table 3 Alternative control group, r/cringetopia

	Model 1
Treat	0.043 (0.849)
Kpop	− 0.722 (0.544)
Treat × kpop	0.896 (0.433) **
ln(no. of posts)	0.867 (0.110) **
ln(Cumulative No. of Comments)$_{t-1}$	0.132 (0.071) *
Num. Obs	364
R2	0.897
AIC	1023.5
BIC	1627.5
Log. Lik	− 356.731

OLS estimates with robust standard errors in the parantheses. The dependent variable is the daily number of comments (logged) in r/cringetopia. The result for the month dummy variables is abbreviated to spare space

right are the cases where the treatment is set to take place *n* weeks earlier $(t − n)$ and later $(t + n)$ than that, respectively. The figure suggests that, when deviating more than a week away from the benchmark treatment timing, the coefficients become notably insignificant, lending additional credence to the benchmark treatment timing.

The last robustness check concerns the control group. The 'China' posts are assumed to offer the best possible comparison with the 'K-pop' posts because a) they are available over long enough a period of time, a feature unparalleled with any other post topics and b) they can be used adjustment for a potential confounder (i.e., Anti-Asian sentiment) without being affected by the treatment. Given that the treatment timing is close to the beginning of the pandemic, however, using an alternative control group might be warranted to fend off the possibility of another confounder. For example, the pandemic could have driven the Redditors to spend more time online than before, thereby making the number of comments on K-pop posts look greater, even if it was really the increases in the overall number of comments that caused the phenomenon.

To address this concern, Table 3 reports the difference-in-difference estimates using the number of comments of the entire subreddit as a control group. This control group is assumed to be affected by the pandemic, but not by the treatment because, say, an anti-Trump comment would not have anything to do with the Korean news surge. The benchmark result remains robust to this alternative, indicating that the number of comments on K-pop posts increased significantly more than those on other posts did. What the benchmark DiD estimates capture is less likely the effect of the pandemic per se and more likely the effect of the positive news stories of South Korea that the Redditors were not comfortable with.

4 Conclusion

This paper analyzes two non-fan K-pop Subreddits (*r/WeHateKpop* and *r/Cringe-topia*) to elucidate non-fans' online behavioral changes upon being exposed to new information about South Korea. The positive news stories about the country concerning its handling of the Covid-19 Crisis irritate the non-fans as they naturally associate K-pop with South Korea. A positive depiction of South Korea appears to them as if K-pop was publicly vindicated, if not praised. The irritation leads to a backlash, thereby resulting in their heavy engagements with posts (measured by the number of comments) in the Subreddits nearly universally skeptical of K-pop. In this paper, I present a series of econometric evidence strongly supportive of these arguments.

The paper advances several different bodies of the literature. First and foremost, the paper is the first systematic investigation of the relationship between the changes in the national image and negative public opinions about pop culture. Although pop culture in general (e.g., Nye and Kim 2019) and K-pop in particular (e.g., Oh, 2013) have already been extensively discussed in the context of national image and soft power in the literature, much of it remains a descriptive analysis.[14] The questions on behavioral aspects of the subject are not sufficiently addressed in these studies. The behavioral dimensions of intercultural exchanges are subsequently left to narrow and specialized fields such as business and marketing research (e.g., Trolan, 2017). The current paper overcomes these traditional confines and directly tests the behavioral implications of the perception of foreign popular culture. As a result, the paper documents a counter-intuitive finding—positive news stories can backfire, thereby demonstrating how behavioral economics can be useful in cultural economics by synthesizing the psychological aspect of human behaviors and econometric methods (Coate & Hoffmann, 2022).

Second, the paper extends the empirical purview of the cultural economics literature. Despite its increasing importance, pop culture has largely been left out of the literature. Recent innovative studies (e.g., Aray, 2021; Kim et al., 2021) did employ pop culture as a primary empirical domain. And yet they did so only *instrumentally*: pop culture is used to test the traditional, non-cultural theses such as preferences in sequential voting (Kim et al., 2021; Page & Page, 2010) or public information and growth of an industry (Aray, 2021). While these studies certainly mark an advancement in the field, they come short of focusing on topics unique to the culture. The current paper offers an analysis of cultural phenomenon (backlash to pop culture) observed in a cultural domain (Subreddit), thereby contributing to filling this lacuna.

Third, the paper is also a rare systematic analysis of non-fans of K-pop. Empirical studies on K-pop draw largely on anecdotal vignettes of fans (King-O'Riain & Rebecca, 2020; Malik & Haidar, 2020), who are themselves interested in participating in K-pop research. This strand of research offers valuable thought-provoking insights as to how pop culture can spread across borders. However, a study solely relying on anecdotal and interview-based fan data compiled on a self-selection

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[14] One exception is Daniel and Furman and Paul Musgrave. (2017), which demonstrates that pop culture texts bring about synthetic experience, contributing to the public worldview.

basis is inherently limited in highlighting how the rest of the society—not part of the active fandom—views K-pop. Researchers sometimes find innovative ways to study non-fans through the fans' accounts (e.g., Yoon, 2019) but the data are by definition indirect with answers heavily primed by the interviews. Most importantly, given social conformity bias, it would be challenging to obtain candid opinions of non-fans about K-pop and South Korea through interviews and surveys. The current paper, on the other hand, exploits large-N online data that captures behavioral aspects of structured and focused online non-fan activities. By leveraging the fact that the contents (posts and comments) of these Subreddits do not vary and, therefore, focusing on the number of comments, the paper can shed light on the non-fan activities independent of their own narratives or rhetoric.

Lastly, the paper contributes to the study of online hate speech. Economists and behavioral scientists have documented extensively how biases toward outgroups are expressed in online spaces in recent years (Bohren et al., 2019; Sadler, 2021). But "surprisingly little is known about" online hate speech (Siegel, 2020,56). The paper thus adds significantly to the literature by delineating one of the ways in which hate speech can emerge in an online space, namely, the backlash to 'foreign' pop culture.

Appendix

Bayesian structural time series model

See Table 4.

The model used in the Bayesian structural time series analysis (i.e., 3) can be expressed by two equations.

$$y_t = Z_t^T \alpha_t + \epsilon_t, \tag{4}$$

$$\alpha_{t+1} = T_t \alpha_t + R_t \eta_t, \tag{5}$$

where y_t is a scalar observation, Z_t is a d-dimensional output vector. T_t is a $d \times d$ transition matrix and R_t is a $d \times q$ control matrix. ϵ_t is a scalar observation error with noise variance σ_t is a q-dimensional system error with a $q \times q$ state-diffusion matrix Q_t where $q \leq d$. Here Eq. (4) is the observation equation while Eq. (5) is the state equation. The former links the observed data y_t to a latent evolution of the state vector α_t and the latter "governs" the changes in the state vector α_t (Perles-Ribes et al.

Table 4 Bayesian structural time-series analysis	Prediction effect	Average	Cumulative
	Actual	4.7	173.1
	Prediction	3.9	144.7
	95% CI	[3.6, 4.2]	[134.0, 155.6]
	Absolute effect	0.77	28.46
	95% CI	[0.47, 1.1]	[17.52, 39.1]

2018,1816–1817). In essence, the model generates posterior simulations based on posterior predictive distribution over the counterfactual time series (which in itself created based on the pre-treatment observed data). The simulations produce the samples from the posterior (approximate) causal effect.
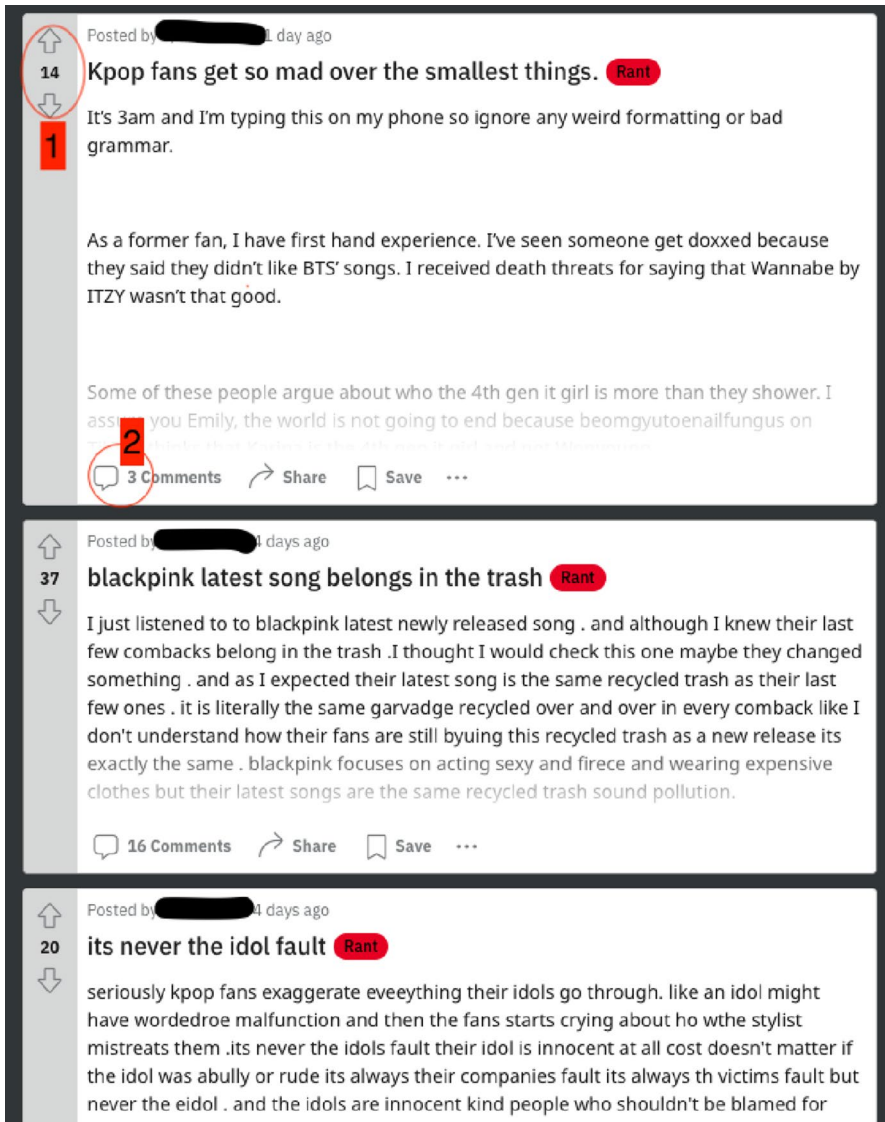
See Figures 7, 8, 9, 10, 11, 12 and 13.

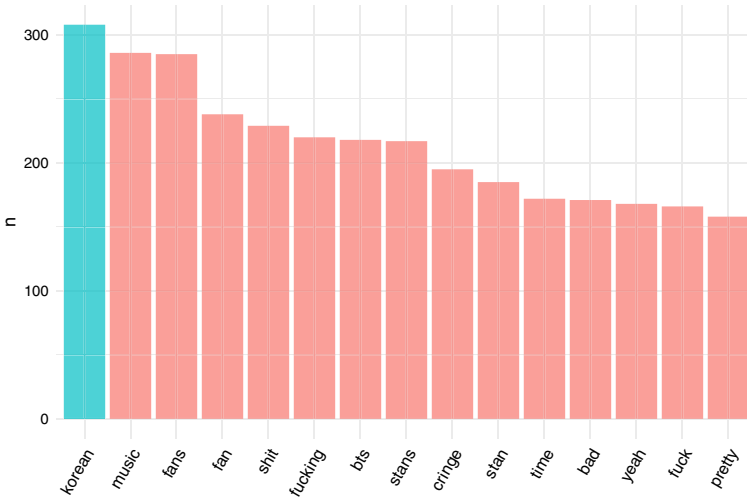**Fig. 7** An anonymized example of Subreddit Post (*r/WeHateKpop*). 1: up-down vote status; 2: number of comments to the post

Fig. 8 Word Frequency in Kpop-related comments of *r/Cringetopia*
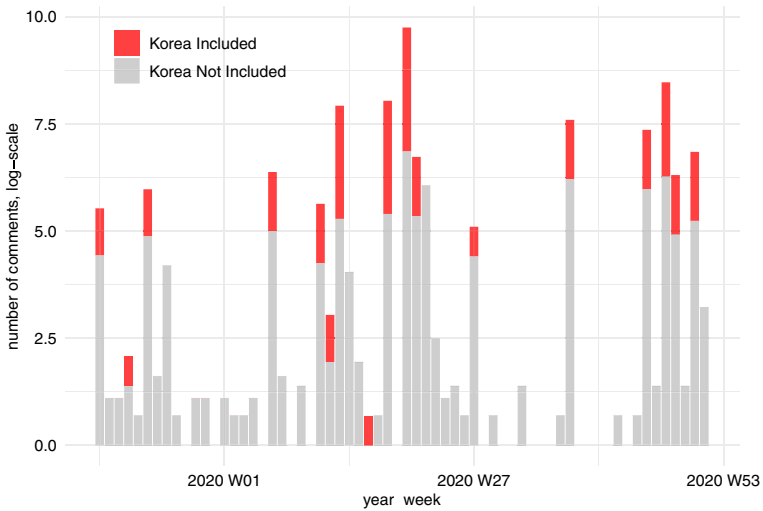
Fig. 9 Weekly number (log) of comments including 'Korea' *r/Cringetopia*
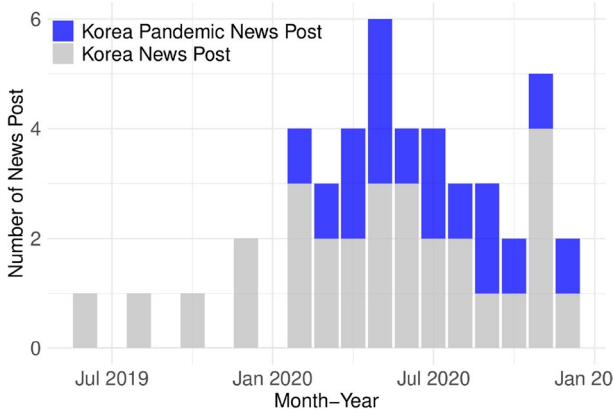
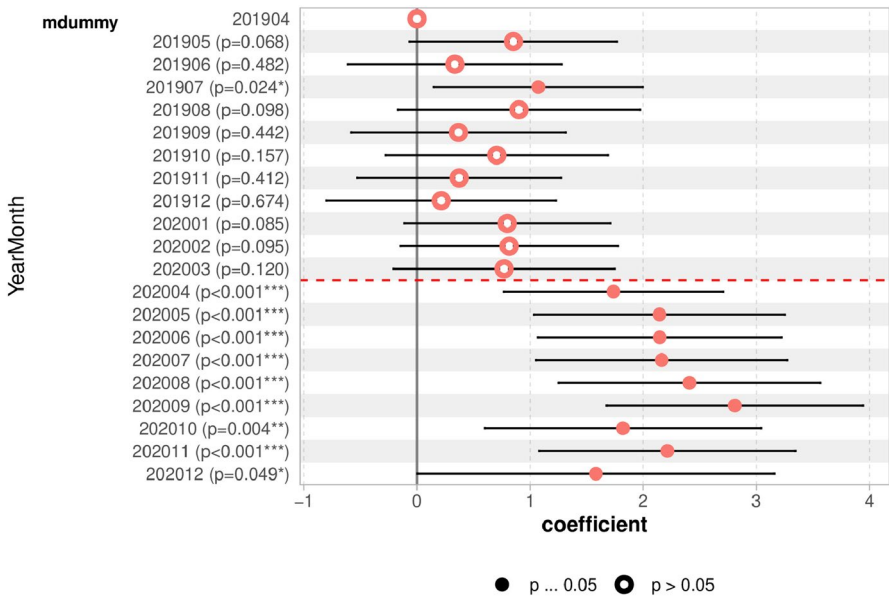**Fig. 10** South Korea Pandemic News Posts in *r/news* and *r/WorldNews*

Fig. 11 Event study analysis (*r/WeHateKpop*). An event study approach, plotting the OLS estimates for the month dummy variables (the model does not converge when weekly dummies were included). The horizontal dashed line indicates the time of treatment. All covariates but the trend variable in Eq. (1) are included for the estimation
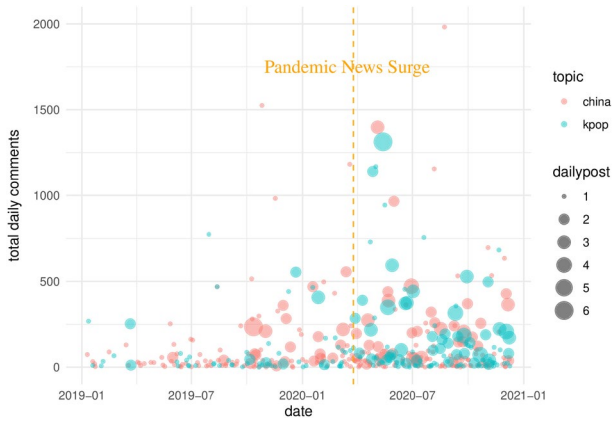
Fig. 12 Daily posts and comments on Kpop and China. Plotted are the daily numbers of posts and comments Kpop as well as those of China in *r/Cringetopia* over time
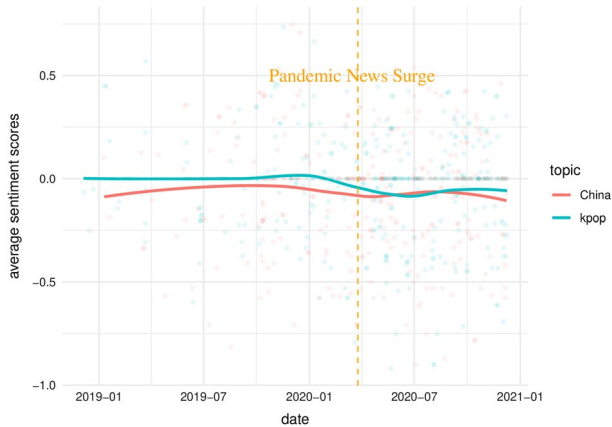

Fig. 13 Sentiment analysis of comments, *r/Cringetopia*

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