Understanding the Review Bombing Phenomenon in Movies and Television

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Abstract

Review bombing, where users post many negative reviews to lower a product's rating, is a phenomenon that has become an increasingly prevalent problem in the entertainment industry and garnered significant attention in the popular press. These reviews are characterized by inflammatory language over a social, cultural, or political issue related to the product, and are less about the quality of the product itself. Using a dataset of 3232 reviews from Metacritic.com, we find evidence that review-bombed products have a high expert/user score gap, high review polarity, high negative imbalance, and evidence of collective action, compared with a paired set of non-bombed products. Specifically, we find evidence of collective trolling, as bombed product reviews are 20% shorter, but have 83% more negative emotion, 25% more anger, and 130% more controversial words. We provide several avenues for future research on review bombing.

Keywords: Review bombing, Bombed Index, Collective trolling, Entertainment, Online reviews

1. Introduction

Traditional online reviews rely on the wisdom of the crowds to produce evaluations of product quality that lower the uncertainty of purchase decisions (Chen et al., 2021; Dimoka et al., 2012; Hong & Pavlou, 2014; Sahoo et al., 2018). Consumer crowds in online communities have long been known to generate innovation and other social and economic benefits (Kozinets et al., 2008) and foster the cocreation of value (Vargo et al., 2008). Yet in some circumstances, the crowd seems more aggressive or mean than wise. The crowd can also damage public perception of entertainment products such as movies, television shows, and games through online communities and platforms.

Review bombing takes place at the product level and increases uncertainty and controversy on review platforms. A basic definition of reviewing bombing is "a collective action where many people, or a few people with multiple accounts, intended to lower the aggregate score and comments about a specific cultural or political aspect rather than the overall quality of the product" (Wikipedia, 2022). Review bombing may include comments on traditional product quality aspects, but the main focus is often on culture or politics. The uncertainty that review bombing creates can be unsettling to consumers and firms.

For example, Disney+ spent $150 million to produce the show Ms. Marvel. The critics liked it (78 out of 100), but an early rush of 1-star reviews from users complaining about the non-white, female, and Muslim superhero pushed the user score down to 3.8 out of 10. This is one of many recent instances of review bombing discussed in the entertainment and business media (Dorsch, 2023).

Media reports of review bombing often discuss the controversy, but generally do not make clear distinctions between "bombed" products and products that are just rated unfavorably. Several media outlets reported the 2023 video game Redfall was review bombed (Ampoloquio, 2023; Bagaria, 2023; Craig, 2023). However, on closer examination, the main complaints were game bugginess and performance issues (Ampoloquio, 2023; Bagaria, 2023; Craig, 2023) and as one headline states, "gamers and critics alike are review bombing Redfall." (Ampoloquio, 2023). In this case, both users and experts are calling out a legitimate product quality issue. This is inconsistent with the generally accepted definition of review bombing (Tomaselli et al., 2021; Wikipedia, 2022), where the wisdom of the crowd is supplanted by the "coordinated provocative and aggressive actions" (Li et al., 2022) of collective trolling.

In this paper, we focus on the emerging phenomenon of review bombing in movies and television shows, which are often bombed because of social or political issues (Tomaselli et al., 2021, 2022). Media reports have documented that review bombing involves comments focusing on those issues rather than on product quality (Hibberd, 2022), including race,

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gender, and sexuality (Dorsch, 2023). For example, 35.8% of the user reviews on IMDB for the recent Marvel series She-Hulk were 1-star (Tassi, 2022). On Metacritic, the critic score for the series is 67/100, while the average user score is 2.4/10 (Fisher, 2020; Metacritic, 2022). These negative reviews were attributed to the series being a "show directed by, written by, produced by, and starring women" (Tassi, 2022). Beyond the score, the bombing is reflected in the text of the reviews. The following are three user reviews on Metacritic for She-Hulk:

"Feminist agenda from beginning to end. And it's NOT funny! It's offensive to men and women with a fully functional brain."

"Yet again just another poorly written, woke garbage show that hates men. 0/10"

"Woke garbage….I really wanted a good she-hulk series, but they couldn't help themselves, I suppose…they had to make it woke."

In practice, review platforms consider review bombing as harmful to their reputation and financial interests, under the assumption that review bombers often succeed in lowering the users' rating score (Moro & Birt, 2022). Low ratings can discourage positive word of mouth, hurt the product's reputation, and negatively impact profitability. To respond to review bombing, Yelp and Google removed those reviews from their platforms (Holt, 2022; Towey, 2021), and Rotten Tomatoes and Metacritic no longer allow users to leave reviews before a product's release (Fisher, 2020; Polo, 2019). Despite these efforts, review bombing continues.

In this research, we explore the phenomenon of review bombing within the context of prior academic literature. A systematic examination of these reviews' characteristics enables an exploration of the mechanisms underlying this phenomenon and improves understanding of how it affects related stakeholders. To aid our analysis, we develop a metric that helps identify review bombing and assess its case-specific severity. This research also contributes to the online review literature by examining the unintended consequences of review bombing and providing recommendations for online review platforms.

2. Related Literature

2.1. Online Reviews

Review bombing is a relatively new phenomenon, but other aspects of online reviewing behavior have been studied extensively. The established body of research has focused on "genuine" reviews that evaluate a product, are written by actual consumers who purchased and experienced the product, and provide information about product quality in their rating score and review content (Mukherjee et al., 2012). The literature has mainly focused on how genuine reviews can provide valuable information for users (Chen et al., 2021; Chevalier & Mayzlin, 2006; Kwark et al., 2014). Prior literature explored the motivation of online product reviewers, such as intrinsic motivations (i.e., altruism, reciprocation, dissonance reductions) (Dellarocas, 2006; Hennig-Thurau et al., 2004; Khern-am-nuai et al., 2018), factors that affect review posting behaviors such as financial incentives (Cabral & Li, 2015) and social norms (Burtch & Chan, 2018), and the determinants of review helpfulness (Mudambi & Schuff, 2010). Other scholars examined how online product reviews reduce uncertainty (Chen et al., 2021; Dimoka et al., 2012; Hong & Pavlou, 2014; Kwark et al., 2014) and affect sales (Chevalier & Mayzlin, 2006; Lee et al., 2021). Research has also examined fake reviews, fraudulent reviews that do not reflect a consumer's actual experience of a product, service, or business (He et al., 2022), and the detection of fake reviews (Lappas et al., 2016).

Review bombing is related to but distinct from genuine and fake reviewing behavior. Despite the media attention, there are few examples of academic research that address review bombing behavior or aid managerial decision making around this issue. Although they did not directly refer to the phenomenon of review bombing, Schoenmuller et al. (2020) systematically examined review polarity and review imbalance at the platform level through an analysis of more than 200 million reviews on 25 online platforms. Tomaselli et al. (2021, 2022) developed an in-depth case study of the 2020 review bombing of a video game, using text mining and visualizing the distribution of ratings.

Our analysis of review bombing is facilitated by extensive prior research on the distribution of online reviews. That literature establishes a firm foundation for examining review bombing through the lens of polarity and imbalance. In addition, the nature of review bombing shares many commonalities with other well-studied phenomena, such as collective trolling. Those two bodies of research provide a broader context for our study.

2.2. Review distribution

Significant attention has been paid to the bimodal nature of star rating distributions in consumer-generated online product reviews (Dellarocas, 2006; Hu et al., 2009). Star ratings follow a "J-shaped" distribution on sites such as Amazon.com, where the greatest number of reviews tend to carry the highest rating, followed by reviews carrying the lowest rating, and relatively few

reviews in the middle. Research has indicated inherent reporting biases among consumers. Hu et al. (2009), for example, propose a "brag-and-moan" model where consumers tend to report more often when their opinions are strongly positive (5-star) or strongly negative (1-star). Schoenmuller et al. (2020) discuss polarity self-selection, the tendency of extreme evaluations to have little informativeness.

2.3. Collective trolling

Consistent with the notion of review bombing, collective trolling has been defined as "coordinated provocative and aggressive actions against certain individuals and groups in virtual communities" (Li et al., 2022) and has been examined in multiple contexts. The components of collective trolling include efficacy, anger, and social identification (Jost et al., 2017). Evidence of why or how the collective action of reviewing bombing takes place, however, has received little attention in the literature. A better understanding of collective action in the review bombing context will facilitate the identification of future review bombing campaigns and an understanding of what drives them.

The online reviews literature has examined aspects of reviewing behavior that have a logical connection to the three components of collective trolling. Efficacy is generally considered the power to produce a certain result. For trolling and review bombing, the desired result is to lower the target's reputation. For online reviews, reputation is often quantified in the literature by the average review score. Research on online reviews has also involved extensive text mining of review content using LIWC (Huang et al., 2017; Yin et al., 2014) and other software. This has provided insights into the nature of reviewers' self-expression, such as their choice of language, and how review style affects the informativeness and diagnosticity of reviews (Mudambi & Schuff, 2010; Wu et al., 2017).

Our research draws on the related literature that has used systematic text analysis to enhance understanding of the linguistic characteristics of online firestorms (Herhausen et al., 2019; Jost et al., 2017; Li et al., 2022) and online reviews (Goes et al., 2014; Zhou et al., 2018). In particular, negative emotions and the specific emotion of anger can be identified through text mining. Similarly, the collective trolling component of social identification can be evident in online reviews. Social identification of being anti-feminist, anti-LGBTQ, etc., may be evident through specific text-mining dictionaries.

3. Investigating the characteristics of review bombing

In contrast to review-level research on genuine and fake reviews, review bombing occurs at the product level. We build on the literature to develop a set of hypotheses to develop a conceptual foundation of review bombing. This conceptualization consists of four observable characteristics of review bombing: the expert/user score gap; review polarity; review negative imbalance; and collective action. In this section, we briefly discuss each characteristic.

3.1. Expert/user score gap

In media reports, evidence of review bombing has generally referred to the difference between expert and user scores in the short time frame of the first week after product release. Entertainment professionals review the product favorably but users "bomb" the product with 1-star reviews before or right after the product release. Collective trolling involves the intent of efficacy (Jost et al., 2017), as evidenced by a reduction in the user review score. Quantifying and calibrating the expert/user score gap would facilitate the detection of review bombing. However, there has not been an accepted measure that quantifies this gap and indicates the severity or efficacy of the bombing. Therefore, we hypothesize:

H1. The expert/user score gap is positively associated with review bombing.

3.2. Review polarity

The distribution of a product's reviews is highly relevant to detecting and understanding review bombing. Schoenmueller et al. (2020) define polarity as the proportion of reviews with extreme scores, indicating how extreme is the distribution of reviews. When users leave many 1-star reviews, this increases the polarity of the set of reviews for that product. As a result, polarity can be a diagnostic measure for detecting and assessing cases of review bombing. Therefore, we hypothesize:

H2. Review polarity is positively associated with review bombing.

3.3. Review negative imbalance

Imbalance refers to the proportion of positive or negative reviews in all extreme reviews (Schoenmueller et al., 2020), indicating the distribution's skewness. When users leave many 1-star reviews, this not only

increases polarity, but also increases the negative imbalance of the set of reviews for that product. The quantification of review negative imbalance can be another diagnostic measure for detecting and assessing cases of review bombing. Therefore, we hypothesize:

H3. Negative review imbalance is positively associated with review bombing.

3.4. Collective action

A key feature of review bombing is the appearance of collective action. Indications of collective action include the short time window of negative reviews, as already accounted for in the expert/user score gap. Beyond the low scores, non-academic discussions of review bombing have often centered on the spurious nature of the review comments.

Reviews of review bombed products often criticize using highly emotional language. With review bombing, it is reasonable to expect the expression of high arousal negative emotions, such as anger and anxiety. This leads us to hypothesize:

H4a. The presence of negative emotions in the review text, especially the presence of high arousal negative emotions (anger and anxiety), is positively associated with review bombing.

Another indication of collective action is the use of controversial words in the review text. Review bombing often involves comments with less focus on the typically-reviewed attributes of a movie or show, and more focus on cultural or political aspects. Review bombing frequently mentions potentially controversial topics such as race, gender, and sexual identity. Reviewers act more like trollers, using argumentative language and breaking social norms. Therefore, we hypothesize:

H4b. The presence of controversial words in the review text is positively associated with review bombing.

Another notable aspect of review bombing is the shorter average length of the reviews. Review length has been established as an indication of review diagnosticity or informativeness (Schoenmueller et al., 2020), with longer reviews better able to help a purchase decision. Short reviews are not able to provide as much useful information. Indeed, being diagnostic may not be the reviewer's intent. Therefore, we hypothesize:

H4c. Average review length in the set of reviews is negatively associated with review bombing.

Taken together, this set of hypotheses allows us to test our expectations of review bombing behavior. The following section describes the empirical context and data used to test our hypotheses.

4. Data collection

We obtained data from Metacritic.com, an online review platform for films, television shows, music, games, and books. To identify bombed products (e.g., movies or TV shows), we searched for news stories about review bombing from a wide range of sources (e.g., Yahoo, The Direct, Movie Web, Forbes, The Hollywood Reporter). If there were more than three review bombing press reports for a product, we put that product into the "potentially bombed" sample pool. We also evaluated the comparability of those products for pairing with movies or TV shows that are similar across multiple dimensions (e.g., gender, sexual orientation, subject, franchise) but have not been bombed.

After carefully filtering the products with the above criteria, we developed a list of five review bombed products (i.e., *Bros, Ms. Marvel, Star Trek: Discovery, The Lord of the Rings: The Rings of Power, She-Hulk: Attorney at Law*) and collected their reviews accordingly. Each of these products was paired with a comparable non-bombed product. Products were paired based on similar narrative themes (*Bros* and *Love, Simon*) and franchises (*Star Trek: Discovery* and *Star Trek: Strange New Worlds*). The result was a unique dataset of 10 products and 3 reviews. The observational window is from 2014 to 2022. In addition to the text of the review, we collected the critic "Metascore" (from 1 to 100) and the average user score (from 1 to 10) for each product.

5. Analysis and results

5.1. Expert/user score gap

To test H1, we calculated the ratio of the product's Metascore to its average user score for each movie or television series in our data set. We call this ratio the "Bombed Index" (BI). If the critics and users are perfectly aligned, then the BI should be 10 (i.e., Hawkeye has a Metascore of 66 and a user score of 6.6). As a heuristic to determine the presence of review bombing, we use Metacritic.com guidelines that a "generally favorable" rating score is 60 or greater, and the "generally unfavorable" rating score is 4 or below. This means a BI of 15.0 (60/4) or higher can be considered to signal the presence of review bombing. It should be noted that this rule of thumb of "15" is specific to the way Metacritic does its scoring, although

Table 1. Bombed Index of bombed vs. non-bombed products in dataset

Product	Release Date	Bombed (1=yes)	Metascore Critic Score	User Score	Bombed Index (BI)
Bros	09/30/22	1	72	4.0	**18.0**
Love, Simon	03/16/18	0	72	8.1	8.9
Ms. Marvel	06/08/22	1	78	3.8	**20.5**
WandaVision	01/15/21	0	77	7.0	11.0
She-Hulk: Attorney at Law	08/18/22	1	67	2.3	**29.1**
Hawkeye (2021)	11/24/21	0	66	6.6	10.0
Star Trek: Discovery	03/17/22	1	73	3.2	**22.8**
Star Trek: Strange New Worlds	05/05/22	0	76	6.6	11.5
The Lord of the Rings: The Rings of Power	09/01/22	1	71	2.6	**27.3**
The Hobbit: The Battle of the Five Armies	12/04/14	0	59	6.9	8.6

Bombed product is in bold; non-bombed comparison product immediately follows in italics

it could be generalized to other platforms based on their scoring criteria.

The products' BI is presented in Table 1 and reveals a stark difference between the bombed and the non-bombed products. Each bombed product has a two to three times greater BI than the non-bombed counterpart. To test whether that difference is statistically significant, we performed a two-sample non-parametric test (due to the small sample size). We found significant differences in BI between bombed (M=23.54, SD=4.62) and non-bombed products (M=10, SD=1.27); p<.001). Therefore, our results provide support for H1.

5.2. Review rating distribution (polarity and negative imbalance)

We looked for further evidence of review bombing in the distribution of review ratings. To quantify and test differences in the reviews of bombed and non-bombed products, several steps were taken. First, we created a visualization of the distribution of the aggregated reviews across the 0 to 10 rating score for each product in our data set. Those visualizations are provided in Figure 1. We can see that the reviews of the bombed products are distributed in a reverse J-shaped pattern, with more negative than positive reviews and few moderate reviews, consistent with the findings of Tomacelli et al. (2022). In contrast, the reviews of the non-bombed products are distributed in the typical J-shaped pattern more typical of online reviews (Hu et al., 2009; Schoenmueller et al., 2020), also consistent with Tomacelli et al. (2022). The distribution of the reviews of non-bombed products is consistent with previous literature that found that the distributions of product ratings are positively skewed, asymmetric, and bimodal (Gao et al., 2015; Hu et al., 2009).

Next, we examine polarity (to test H2) and negative review imbalance (to test H3). The analysis followed the approach used for review polarity and review imbalance previously used to analyze reviews at a platform level (Schoenmueller et al., 2020). We extended this approach to calculate the polarity and imbalance at the product level.

To test H2, we calculate polarity as follows:

$$Polarity = \frac{Number\ of\ 0,1,9,and\ 10\ ratings}{Total\ number\ of\ ratings}$$

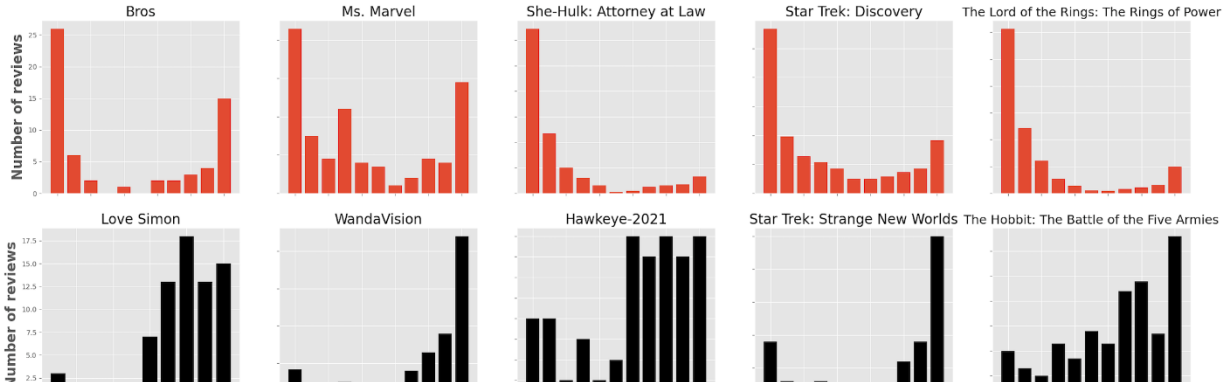

Figure 1. Review distribution for each pair of products

According to Schoenmuller et al. (2020), a polarity measure above 40% for an eleven-point scale implies a polar distribution. Based on this criterion, 100% of bombed products in our sample have a high degree of polarity, and half of the non-bombed products have a high degree of polarity (see Table 2). To check whether the difference in polarity is statistically significant, a two-sample non-parametric test was performed. The results in Table 3 indicate a marginally significant difference in the polarity between bombed (M=73.6%, SD=9.99%) and non-bombed products (M=54.2%, SD=17.25%; p<.08). Therefore, we find some evidence that bombed products exhibit greater review polarity than non-bombed products, in support of H2.

To test H3, we calculate negative imbalance as follows:

$$Neg\ imbalance = \frac{Number\ of\ 0\ and\ 1\ ratings}{Number\ of\ 0,1,9,and\ 10\ ratings}$$

This calculation indicates the skewness of the distribution to the negative side of the rating scale. Following Schoenmuller et al. (2000), a negative imbalance measure of over 50% means there are more negative reviews than positive reviews for one product, and the larger the negative imbalance ratio, the higher the skewness of the distribution toward negative rating scores. Table 2 shows the imbalance measures for bombed and non-bombed products. The results show that 100% of review bombed products have a review distribution with a high degree of negative imbalance, while 100% of non-review bombed products have a review distribution with a high degree of positive imbalance.

To test whether the difference of negative imbalance between bombed and non-bombed products is statistically significant, a two-sample non-parametric test was performed. The results (see Table 3) indicate a significant difference in negative imbalance ratio between bombed (M=75%, SD=13.32%) and non-bombed products (M=22.8%, SD=9.58%; p<.01). Therefore, we find bombed products exhibit greater negative imbalance than non-bombed products, supporting H3.

5.3 Evidence of collective action (language choice)

Another defining characteristic of reviewing bombing is collective action. Prior literature describes three dimensions to measure collective action: negative mood, social identification, and group efficacy (Jost et al., 2017; Li et al., 2022; Sun & Fichman, 2020). We have a proxy measure for each dimension: presence of negative emotional language such as anger and anxiety for negative mood, presence of controversial words for social identification, and shorter length of reviews for group efficacy (Jost et al., 2017; Li et al., 2022; Sun & Fichman, 2020).

To test H4 and explore textual differences between the reviews in bombed and non-bombed products, we used Linguistic Inquiry and Word Count (LIWC) (Herhausen et al., 2019). We used LIWC to quantify the presence of the proxy measures described above. To test whether bombed and non-bombed reviews are significantly different across those measures, we performed a two-sample t-test. The results (Table 4) show that bombed products have about 130% more negative emotion (p<.001), 210% more anger (p<.001) (but not greater anxiety, p<.96), and 83% more controversy (p<.001) than non-bombed products. Further, reviews of bombed products are about 20% shorter than non-bombed products (p<.001). Therefore, we find evidence of collective trolling and support for H4a (greater presence of negative emotion overall and anger, but not anxiety), H4b (greater presence of controversial words), and H4c (shorter length). In other words, in contrast to expressing the diagnostic wisdom of the crowds, bombed reviews exhibit more anger and controversy and less diagnosticity.

Table 2. The polarity and imbalance measures for the set of reviews

Product	Polarity	Positive Imbalance	Negative Imbalance	# of Ratings	Bombed (1=yes)
Bros	84%	37%	63%	61	1
Ms. Marvel	61%	39%	61%	156	1
Star Trek: Discovery	65%	26%	74%	793	1
She-Hulk: Attorney at Law	79%	10%	90%	248	1
The Lord of the Rings: The Rings of Power	79%	13%	87%	1249	1
Love Simon	44%	90%	10%	71	0
WandaVision	67%	83%	17%	223	0
Star Trek: Strange New Worlds	78%	74%	26%	59	0
Hawkeye (2021)	43%	65%	35%	53	0
The Hobbit: The Battle of the Five Armies	39%	74%	26%	319	0

Table 3. Polarity and negative imbalance of bombed and non-bombed products

Character-istic	Bombed (1=yes)	N	Mean (SD)	p-value
Polarity	1	5	73.60% (9.99)	0.08
	0	5	54.20 % (17.25)	
Negative Imbalance	1	5	75% (13.32)	0.01
	0	5	22.8% (9.58)	

Table 4. Textual features of bombed and non-bombed products

Variable	Bombed (1=yes)	N	Mean (SD)	p-value
Negative Emotion	1	2509	2.05 (3.24)	0.00
	0	723	0.89 (1.57)	
Anxiety	1	2509	0.05 (0.32)	0.96
	0	723	0.04 (0.29)	
Anger	1	2509	0.28 (1.02)	0.00
	0	723	0.09 (0.43)	
Controversial Words	1	2509	0.66 (1.42)	0.00
	0	723	0.36 (1.01)	
Length	1	2509	515.57 (657.84)	0.00
	0	723	646.07 (871.53)	

6. Conclusions and future research

Review bombing is a phenomenon that spans gaming, television, and movies, and has caught the attention of entertainment producers, consumers, and researchers. Because of the enormous investments at stake in the movie and television industry, this phenomenon is likely to continue to be a concern.

This study makes several important contributions. First, we reaffirm and expand on prior work on review bombing (such as Tomaselli et al., 2022) by collecting a unique dataset of 3232 reviews across 10 paired products. Second, we use this dataset to build on review bombing reports in the popular media and prior literature in the online review space to create and test a conceptualization of review bombing. Specifically, we find review-bombed products have four important characteristics: a high expert/user score gap, high review polarity (although the difference was only marginally significant), high negative imbalance, and evidence of collective action, compared with non-bombed products. Third, we develop a metric to quantify the expert/user score gap, the Bombed Index, that measures the extent of review bombing for a particular product. Fourth, we explore the nature of the collective action taking place in review bombing and show that for the reviews of "bombed" products there is greater overall negative emotion and anger, greater use of controversial words, and less diagnosticity.

Our study also has several significant practical implications. First, the findings of our research help producers of entertainment products, specifically movies and television shows, to increase their understanding of review bombing. This allows them to identify and address sudden surges of negative reviews and low ratings more effectively. A better grasp of the characteristics of review bombing can help content producers and distributors differentiate between genuine customer dissatisfaction and coordinated attacks so that they can act accordingly. Second, our research offers valuable insights for review platforms like Amazon, Yelp, Google, and Metacritic. These platforms can use insights from our study to enhance their review moderation and filtering algorithms by searching for specific textual features such as negative emotion, anger, and controversial words, ensuring the integrity of user reviews, and providing accurate information to their users. Platform moderation can also foster a positive environment with an objective of encouraging online engagement and the cocreation of value for individuals and firms.

There are several promising avenues for future research. First, we limited the scope of our study to the review bombing of movies and television shows. Future work could investigate whether our findings hold for other targets of review bombing such as video games and restaurants. There should also be further investigation of review polarity, as the polarity results were only marginally significant. Second, the Bombed Index (BI) metric is based on guidelines specific to our data source (Metacritic.com). Future research could extend and test the BI using our heuristics (ratio of high critic score to low user score) on other platforms. Third, we look at review bombing at a single point in time. Future research could build on longitudinal work such as Tomaselli et al. (2022) and apply our approach to explore how review bombing evolves. This could provide additional insight into the collective action taking place among users. Fourth, future research could more directly address the impact of review bombing on online review platforms and the products themselves, especially regarding user engagement with and trust in

the platforms, and the effect of review bombing on viewership and box office sales. In our polarized digital environment, review bombing is likely to continue to be a behavior with potential negative impacts on individuals, groups, firms, and society. This makes the review bombing phenomenon worthy of further monitoring and investigation.

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