Journal of Business Research 87 (2018) 24–35

Contents lists available at ScienceDirect

Journal of Business Research

journal homepage: www.elsevier.com/locate/jbusres

Manufactured opinions: The effect of manipulating online product reviews

Mengzhou Zhuang[a], Geng Cui[b,*], Ling Peng[b]

[a] Department of Business Administration, University of Illinois at Urbana-Champaign, Champaign, IL, USA
[b] Dept. of Marketing and International Business, Lingnan University, Tuen Mun, Hong Kong

ARTICLE INFO

Keywords:
Online product reviews
Manipulation
Suspicion
Persuasion knowledge
E-commerce

ABSTRACT

Previous research assumes that consumers can detect and discount the manipulation of online product reviews or are oblivious to such practices. We posit that the equilibrium occurs due to the cues of manipulation, consumer suspicion and their expertise. Our analysis of hotel occupancy data shows that the effect of adding positive reviews and deleting negative reviews on sales exhibits an inverted U-curve. Moreover, weak brands suffer more from excessive adding. Our laboratory experiments find that adding affects consumer purchase intention, but it also arouses suspicion, which exerts a negative mediating effect. Deleting is more disguised and difficult to be suspected. Novices are more influenced by manipulations compared with their experienced counterparts. Thus, contrary to the popular belief of "fake it until you make it," excessive adding leads to consumer distrust and may backfire. Deleting exacerbates information asymmetry and results in adverse selection, thus warrants restraint and regulation.

1. Introduction

Given the tremendous impact of online product reviews on consumer purchases, firms may manipulate online reviews to increase sales by anonymously posting favorable reviews and/or deleting negative reviews (Hu, Bose, Gao, and Liu, 2011). As a half-star difference in a product rating can make or break a business (Anderson & Magruder, 2012), "reputation management" has become a fast-growing industry (Morrison, 2011; Northrup, 2009). By some estimates, up to one-third of all "consumer" reviews on the Internet are fake (Hu, Bose, et al., 2011; Jindal & Liu, 2008). Despite the efforts by e-marketplace operators and review platforms to filter out fake reviews and the strengthening of guidelines and enforcement in various countries, manipulation of online reviews has persisted and taken more varied forms.

Game-theoretical researchers suggest that when rival firms monotonically increase their manipulations of online reviews regarding product quality, online recommendations remain credible given a sufficiently large quantity of consumer reviews (Mayzlin, 2006). In addition, manipulations may increase the informativeness of online reviews for firms with better-quality products despite the noise in the system (Dellarocas, 2006). These studies assume that consumers are aware that manipulation takes place and can update their beliefs and adjust their interpretations of online opinions accordingly. However, research on opinion spam shows that consumers may not be able to detect manipulations or correct for the related bias (Hu, Liu, and Sambamurthy, 2011). As more firms join this "arms race" of manipulation (Dellarocas, 2006), managers often find themselves in a prisoner's dilemma (Gössling, Hall, & Andersson, 2018).

Due to the covert nature of review manipulation, few studies have assessed its effect on sales. Thus, there is little empirical evidence on the benefits of manipulation for firms or the economic effect of such "misinformation." In addition, while studies have examined the posting of fake positive reviews (e.g., Lappas, Sabnis, & Valkanas, 2016; Luca & Zervas, 2016; Mayzlin, Dover, & Chevalier, 2014), the practice of deleting or hiding negative reviews—another prevalent but more disguised form of review manipulation—remains unexamined in the literature. More importantly, the literature offers little guidance to managers because it has not explored the theoretical mechanism underlying the effect of review manipulation. Given these research gaps, several important questions need to be addressed: 1) How does review manipulation affect product sales? 2) Are the effects of adding fake positive reviews different from those of deleting or hiding negative reviews? 3) Does manipulation result in adverse selection by consumers, where better-quality products are outsold by those with poor brand reputation? 4) To what extent can consumers detect manipulation and discount the manipulated reviews?

We believe that the answers to these questions lie in both the availability of manipulation cues and the ability of consumers to detect and adjust for manipulated reviews. First, drawing from research on deception detection and consumer psychology, we propose that intensive manipulations inevitably leave traces and dampen consumer confidence and product sales. Thus, we posit that review manipulation,

* Corresponding author.
E-mail addresses: mzhuang2@illinois.edu (M. Zhuang), gcui@ln.edu.hk (G. Cui), lingpeng@ln.edu.hk (L. Peng).

https://doi.org/10.1016/j.jbusres.2018.02.016
Received 13 February 2017; Received in revised form 8 February 2018; Accepted 9 February 2018

both adding and deleting, exhibits an inverted U-curve relationship with product sales, in that manipulation initially increases sales, but excessive manipulation is counter-productive. We also examine how the effect of manipulation differs across firms with various levels of brand strength.

Second, compared with persuasion via advertising and promotions, covert manipulations of online reviews are complex, disguised, and more difficult for ordinary consumers to detect. To assess the ability of consumers to suspect manipulation and adjust their purchase intention, we propose that manipulations arouse consumer suspicion, which has a negative mediating effect on purchase intention. Moreover, as adding fake positive reviews and deleting or hiding negative reviews differ in the availability of manipulation cues, these practices arouse suspicion and affect consumer purchase intention to different degrees. We further propose that consumer expertise in online shopping moderates the effect of manipulation on consumer suspicion.

Given the dearth of evidence on the effect of review manipulation, this is the first study to empirically assess its effect on product sales using both field data and a laboratory experiment, and it makes several important contributions to the literature. While research based on the efficient market assumption suggests that an equilibrium in manipulation occurs due to competition among firms and consumers' awareness of the manipulation (Dellarocas, 2006; Mayzlin, 2006), thinkers of the new economics emphasize information asymmetry and lament the vulnerability of consumers (Akerlof & Shiller, 2015). To bridge the gap between these two streams of literature, we believe that studies of consumer psychology and information processing can shed light on the mechanism underlying the effect of review manipulation. Drawing from research on deception detection and consumer persuasion knowledge, our study focuses on the role of cue availability and consumer suspicion as the key underlying mechanism in this process. Our results on the effects of review manipulation—through both adding and deleting—and on the roles played by firm brand strength and consumer suspicion and expertise help to further understanding of the impact of this growing problem in Internet retailing and yield significant theoretical insights and managerial implications.

The following sections are organized as follows. We first provide a succinct review of the literature on online product reviews and seller manipulations. Then, drawing from research on deception detection and consumer psychology, we articulate our research framework and hypotheses. Next, we present the results from our analysis of field data and two laboratory experiments. Lastly, we discuss the findings and their implications for consumer welfare, e-commerce, and public policy, and explore the directions for future research.

2. Literature review

2.1. Online product reviews

Increasing numbers of marketing scholars have highlighted the effects of online product reviews, including in the areas of sales and marketing strategies (e.g., Chen, Wang, & Xie, 2011; Cui, Lui, & Guo, 2012) and consumer decisions (Sen & Lerman, 2007; Smith, Menon, & Sivakumar, 2005). Others have examined the value of online reviews for sales forecasting (Dellarocas, Zhang, & Awad, 2007) and consumer motivations for posting reviews (Chen et al., 2011). Researchers have used a number of metrics to examine the effect of online word-of-mouth (WOM), including the volume of reviews, average ratings (valence), and the distribution of ratings (dispersion).

The literature suggests that (1) the quality and reliability of reviews are critical factors, and (2) the volume and valence of reviews (i.e., average rating) have a significant effect on product sales (e.g., Cui et al., 2012; Smith et al., 2005). Overall, studies have found that the valence of reviews has varying degrees of influence on consumer purchases and sales, with the standardized beta up to 0.33 for various products, including movies, books, games, and consumer electronics (e.g., Cui et al., 2012; Dellarocas et al., 2007). Researchers have also found that due to the negativity bias among consumers, the negative effect of negative reviews on sales is greater than the positive effect of favorable reviews (e.g., Cui et al., 2012). As a result, firms have strong incentives to manipulate reviews to influence consumer perceptions by altering both the quantity (i.e., the number of reviews) and quality (rating and content) of the reviews (Northrup, 2009).

2.2. Manipulating online reviews

In addition to advertising and promotions, consumers increasingly rely on online reviews to assess the quality of products before making purchase decisions. The reviews posted by previous buyers are considered an unbiased reflection of product quality. To influence consumer perceptions, sellers may manipulate the reviews of their products on company websites, review platforms, and e-marketplaces (e.g., TripAdvisor and Amazon). Recently, operators of e-marketplaces and online forums such as Amazon and Yelp have installed opinion spam algorithms to filter out fake reviewers and their reviews. Businesses have also been prosecuted for such fraudulent and illegal practices, which have non-trivial implications for consumer welfare and the development of e-commerce.

Numerous reports suggest that the manipulation of online reviews by shills is a widespread and growing practice. For example, book publishers and sellers offer various incentives for favorable reviews, such as $25 gift cards for positive reviews of textbooks (Northrup, 2009). Multinational companies such as Bayer, Levi's, Starwood Hotels, Mazda, KFC, and Kraft have all used buzz techniques to influence consumers' purchase decisions (Mayzlin, 2006). It has been reported that because fake fan accounts now sell faster than stolen credit card numbers, the Zeus virus software used to steal credit card data has been modified to create bogus Instagram “likes” to generate buzz for companies, with 1000 “likes” going for $30 (Finkle, 2013). Aside from adding positive reviews, sellers also hide or delete negative reviews. In exchange for a monthly fee, Yelp allegedly offered to move a firm's negative reviews to the bottom of its Yelp page and make it difficult for users to access them (Morrison, 2011). Clearly, adding positive reviews is different from deleting negative reviews in terms of costs and benefits.

Scholars have explored how manipulation of online product reviews affects firms and consumers. Mayzlin (2006) proposes an analytical model in which two competing firms supply anonymous messages praising their own products, and suggests that despite the distortions from deceptive messages, online WOM remains informative given a sufficient amount of authentic reviews. Dellarocas (2006) describes the conditions in which the number of manipulated reviews increases with the quality of the firms and concludes that manipulations from high-quality firms potentially lead to more informed customer decisions. These studies suggest that although manipulations may decrease the informational value of online reviews, they may not affect consumer decisions because consumers are aware that manipulation takes place and sophisticated enough to discount and adjust their interpretations of online opinions.

Due to the covert nature of review manipulation, direct evidence of such practices is lacking. Nevertheless, researchers have used various methods to detect and quantify the extent of manipulation in online reviews (Hu, Bose, et al., 2011; Hu, Bose, Koh, & Liu, 2012). Hu, Liu, and Sambamurthy (2011) focus on the detection of fake positive reviews using a sophisticated classification algorithm and text analysis. Jindal and Liu (2008) propose using “sentiment analysis” to filter out the authors of fake reviews. These researchers suggest that the complex and disguised nature of review manipulation makes it difficult for ordinary consumers to detect or adjust for the bias. Mayzlin et al. (2014) estimate the extent of review manipulation based on a comparison of reviews on Expedia and TripAdvisor. They find that an increase in incentives to manipulate reviews leads to a greater amount of