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Longer online reviews are not necessarily better

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ABSTRACT

Models of information processing have long suggested that people respond in a curvilinear manner to variation in information load and that information use may be restricted when available information is either scarce or abundant. Research on online product reviews, however, suggests that the relationship between the length of online reviews available to consumers and effectiveness measures is positive and linear. To explain this discrepancy, we argue that review length has a negative curvilinear (inverted-U-shaped) relationship with effectiveness and that such a relationship has seldom been observed in previous studies because those have analyzed data collected in low-constraint settings of information processing. The analysis of data about online reviews for free and paid apps, collected on two mobile app stores, provides consistent evidence in support of the hypothesized curvilinear relationship. The findings suggest that maximum cognitive load is experienced at lower review lengths for paid apps than for free apps and that the marginal utility for the majority of review length observations is positive or nonsignificant for free apps and negative for paid apps. These findings are consistent with product-related differences in information processing motivation. The study contributes to the ongoing debate on the ideal length of messages in electronic environments.

1. Introduction

Information processing theory suggests that information use may be restricted when the amount of information available is either scarce or abundant (Schroder, Driver, & Streufert, 1967). The latter case represents a situation of information overload, which refers to the finite limits to the ability of people to process information and to the deterioration in performance once these limits are surpassed (Gross, 1964; Jacoby, 1977; Toffler, 1970). Models of human information processing have long suggested that people respond in a typical curvilinear manner to variation in information load in their environments. As environmental load increases, the amount of information actually used in decisions increases until a point of optimum cognitive load, after which information use declines (Driver & Mock, 1975). The negative performance consequences of information overload have been confirmed in various decision-making contexts (Jacoby, Speller, & Kohn, 1974; Jones, Ravid, & Rafaeli, 2004; Malhotra, 1982; O'Reilly, 1980).

These cognitive limitations, however, are largely absent in research on the effectiveness of online consumer-generated product reviews. Driven by the motivation to understand word-of-mouth behavior in an era of electronic commerce (Ahmad & Laroche, 2017; King, Racherla, & Bush, 2014), numerous attempts have been made in the past decade to empirically capture how quantitative and qualitative characteristics of online product reviews are related to consumer behavior, in particular to product sales (e.g., Chevalier & Mayzlin, 2006; Floyd, Freling, Alhoqail, Cho, & Freling, 2014; Forman, Ghose, & Wiesenfeld, 2008; Ghose & Ipeirotis, 2011; Gu, Park, & Konana, 2012; Neirotti, Raguseo, & Paolucci, 2016). A characteristic often observed in such empirical investigations is review length, typically measured as the average number of characters or words included in reviews for a specific product. This characteristic is consistently hypothesized to be positively related to either product sales or review helpfulness (Baek, Ahn, & Choi, 2012; Fang, Zhang, Bao, & Zhu, 2013; Mudambi & Schuff, 2010). The reasoning underlying these hypotheses rests on two arguments. The first is that longer reviews are less likely to be overlooked than shorter reviews because they take up more screen space and are visually more salient (Kuan, Hui, Prasarnphanich, & Lai, 2015). The second argument is that compared to shorter reviews, longer reviews contain more product-related information, which is likely to increase the consumer's confidence about the purchase decision (Schwenk, 1986; Tversky & Kahneman, 1974) and mitigate product-related uncertainty. Indeed, such predictions about the positive effects of review length have frequently been supported by evidence (Baek et al., 2012; Chevalier & Mayzlin, 2006; Hu & Chen, 2016; Korfiatis, García-Bariocanal, & Sánchez-Alonso, 2012; Pan & Zhang, 2011; Willemsen, Neijens, Bronner, & Ridder, 2011; Wu, 2013; Zhang, Craciun, & Shin, 2010).

Notwithstanding these positive effects, it follows from information processing theory that, at certain review lengths, information overload

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may become an issue and the marginal utility of product-related information may become negative. Past the point of optimum cognitive load, information use may decline and render additional information ineffective and even detrimental to decision making. If, consistent with cognitive accounts of information processing, information contained in product reviews indeed has diminishing marginal utility, then the relationship between review length and effectiveness measures should be curvilinear and take the shape of an inverted U.

In this study, we argue that the positive effects attributed in the existing literature to review length have been the consequence of the frequent reliance on data that reflect the use of personal computers (PCs) rather than mobile devices to engage in electronic commerce. Because the PC setting is typically less constrained than the mobile setting in terms of the time, attention, and screen size available to users, larger amounts of information can be consumed by PC users before they experience information overload. In such settings, therefore, the point of optimum cognitive load, above which the marginal utility of product-related information is negative, is less likely to be observed, resulting in a conclusion that longer reviews are generally more beneficial to users. We hypothesize that in settings of mobile use, in which use is typically more constrained either by the environment or by features of the platform, the point of optimum cognitive load is more likely to be observed in data reflecting the behavior of users, resulting in a conclusion that longer reviews are not necessarily better.

We hypothesize that review length has a negative curvilinear relationship with product demand and test this hypothesis by collecting and analyzing large-scale data from two major stores for Android apps, Google Play and Amazon Appstore. We choose this specific research setting because consumers interact with mobile app stores primarily through mobile devices. This specific setting also allows the comparison of different ranges of review lengths and different product types with different pricing mechanisms. In particular, we collect four sets of data, about free and paid apps from Google Play and about free and paid apps from Amazon Appstore. For each app, we collect data about its demand (i.e., download measure) and about various app and review characteristics. We then regress app demand both on review length and on its squared term, while controlling for app and review characteristics. Across all four datasets, we find a statistically significant, negative coefficient for the squared review length, confirming that the relationship between review length and app demand indeed takes the shape of an inverted-U.

Our results contribute to the emerging literature on the effectiveness of online consumer-generated reviews by offering an explanation that accommodates conflicting findings about the effects of review length, while being reflective of theoretical accounts of information consumption that consider both information scarcity and overload. The findings have important implications for designers of electronic markets, who may wish to constrain the length of reviews in specific settings to increase their effectiveness.

2. Background and hypothesis

The literature generally considers review length to have a positive effect on various performance dimensions (Baek et al., 2012; Chevalier & Mayzlin, 2006; Hu & Chen, 2016; Korfiatis et al., 2012; Pan & Zhang, 2011; Willemsen et al., 2011; Wu, 2013; Zhang et al., 2010). A question that naturally follows is why previous studies described a positive relationship rather than a curvilinear one. The answer to this question is found in the characteristics of the research setting examined in previous work (e.g., Chevalier & Mayzlin, 2006; Floyd et al., 2014; Ghose & Ipeirotis, 2011) and in the lack of attention to idiosyncratic findings that are inconsistent with predictions (e.g., Fang et al., 2013; Huang, Chen, Yen, & Tran, 2015; Kuan et al., 2015).

As for previous work, until recent years, electronic commerce had typically been conducted by using a PC, which places few constraints in terms of time, attention, or screen size on the ability of consumers to process product-related information. In such a setting, large amounts of information can be processed before the consumer experiences information overload. In recent years, electronic commerce has rapidly migrated to mobile platforms, such as smartphones and tablet computers (Piccoli & Ott, 2014; Pousttchi, Tilson, Lyytinen, & Hufenbach, 2015; Wang, Malthouse, & Krishnamurthi, 2015). The mobile setting is more constrained than the PC setting in two aspects. First, by definition, mobile devices are more likely to be used when people are mobile (e.g., walking on the street or sitting in a train station) and can devote less attention to information processing than when they are using stationary PCs. Given that attention is the scarce resource in decision making (Simon, 1978), the need to pay more attention to the environment reduces the attention available for information processing. Second, screen sizes are typically smaller in the mobile setting than in the PC setting, leading to higher costs of information search (Ghose, Goldfarb, & Han, 2013) and to inferior task performance (Sweeney & Crestani, 2006). These two factors – lower attention to information processing and higher information search costs – which characterize the mobile setting in comparison to the PC setting, imply that information overload is likely to be experienced in the mobile setting after processing smaller amounts of information. Because previous research used data largely reflecting the PC setting, characterized by higher optimum load thresholds, it is reasonable that most review length observations were distributed at values lower than these thresholds, indicating that utility always increases with review length. This argument suggests that data reflecting the more constrained mobile setting, characterized by lower optimum load thresholds, is likely to include more review length observations that surpass these thresholds, providing evidence that the marginal utility of review length can be negative.

As for idiosyncratic findings, the existing literature, which has focused on information processing via PCs, does include a few accounts of contradicting evidence, which allude to the existence of a negative curvilinear effect of review length. Importantly, these studies hypothesize about a positive effect of review length, but their evidence suggests that this is not necessarily the case. Huang et al. (2015) examine the effect of review length on review helpfulness by analyzing data on six products from Amazon.com. They find that while review length has a significant positive effect for all reviews, this aggregate positive effect masks a positive effect for reviews shorter than average (144 words) and no effect for reviews longer than average. Based on these findings, they conclude that word count has a threshold in its effect on review helpfulness, above which "its effect diminishes significantly or becomes near non-existent" (Huang et al., 2015, p. 17). The same relationship is implicitly observed in an experiment by Lin, Huang, and Yang (2007), who hypothesize that review length positively affects consumer purchase intention, but find purchase intention to be lower for short reviews than for average and long reviews, without significant differences between consumers shown average and long reviews. Fang et al. (2013) offer several explanations for their finding of a negative effect of review length on product sales (despite their hypothesis of a positive effect), among which is the argument that longer reviews take more time to process. Finally, Kuan et al. (2015) hypothesize that various review attributes positively affect review helpfulness. They analyze reviews for two different products – DVDs and books – and find that review length has different nonlinear effects for different products.

While the idiosyncratic findings reviewed above are considered in the existing literature as inconsistent with predictions of positive effects of review length, these findings suggest that *descriptive* theory about information overload is as crucial to understanding the effects of review length as *normative* theory about information value. The present study thus aims at advancing research on online product reviews by providing a more nuanced account, theoretically anchored in models of human information processing, of the implications of review length. Consistent with the literature (Chevalier & Mayzlin, 2006; Floyd et al., 2014; Gu et al., 2012), we operationally define product effectiveness as product