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Decomposing the effects of online customer reviews on brand, price, and product attributes

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ABSTRACT

Online customer reviews (OCRs) have become a major source of information for customers in the Internet. Understanding the impact of OCRs on customers' decisions is an important challenge for academics and practitioners. We apply a choice-based conjoint experiment that combines all relevant levels of the OCR dimensions (valence, volume, and variance) and that estimates the effect of OCRs on choice. The experimental setting allows us to estimate the direct effects but also the interaction effects of the OCR dimensions, which have been largely neglected in previous research. The impact of the OCR dimensions is evaluated against the results from a control group that did not face OCRs when making their choices. Therefore, our experiment enables us to investigate the extent to which the presence of OCRs affects customers' consideration of brand, price, and technical product attributes. By contrast to previous findings, our results show that volume and variance do not affect customers' choices directly but that they moderate the impact of valence on customers' choices. Moreover, we find that OCRs decrease the importance of brand for customer purchase decisions, indicating that managing OCRs have become a challenge for brand management.

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1. Introduction

Choosing the right product (including services) online can be an exhausting process. The vast variety of products on retailer websites is often overwhelming. To handle such wide-ranging assortments, online customer reviews (OCRs) have emerged as an important information source for customers to evaluate products prior to purchase (Cui, Lui, & Guo, 2012).

OCRs, which are often presented as a summary statistic (e.g., Amazon.com's five-star rating), are a form of electronic word-of-mouth that has become an integral part of the Internet and online retailing in particular (Moe & Trusov, 2011). Through OCRs, customers have quick and easy access to an unprecedented amount of user-generated product information (Duan, Gu, & Whinston, 2008), which can help customers to choose the most appropriate product according to their idiosyncratic preferences based on other customers' experiences (Moe & Trusov, 2011). The experiences and opinions from other customers can contribute information about the quality and value of a product and can therefore reduce customers' choice risk (Cui et al., 2012; Zhu & Zhang, 2010) and complement other forms of business-to-customer communication (Chevalier & Mayzlin, 2006).

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The practical relevance of OCRs is underscored by previous research demonstrating the strong influence of OCRs on sales (e.g., [Chevalier & Mayzlin, 2006](#); [Cui et al., 2012](#)). Accordingly, previous research mainly focuses on explaining or predicting sales, revenue, or sales growth through the consideration of OCRs. However, these studies provide mixed findings with respect to the effects of the three different dimensions that characterize OCRs, namely, valence, volume, and variance. Additionally, the vast majority of present research neglects the potential interaction effects among the OCR dimensions. A recent study by [Sun \(2012\)](#), however, demonstrates the importance of considering these interaction effects.

Moreover, OCRs represent an additional information source for customers that can be used as a quality indicator to decrease uncertainty in the decision process—a role that has traditionally been assigned to brand (e.g., [Erdem & Swait, 1998](#)) but also to product price (e.g., [Völckner, 2008](#)). However, research investigating the effect of OCRs and brand is limited. Notable exceptions are [Ho-Dac, Carson, and Moore \(2013\)](#), who analyze the effect of OCRs on sales considering brand strength, and [Lovett, Peres, and Shachar \(2013\)](#), who analyze which brand characteristics stimulate word-of-mouth. However, although both studies investigate the relationship between brand and word-of-mouth, they do not analyze whether the presence of OCRs affects the role of brand in a choice situation (e.g., selecting a product online). Given the (monetary) effort that firms invest in building brands and in establishing price perceptions in the mind of customers, it is important to understand how customers adapt to a changing information set due to OCRs.

Based on a conceptual framework that links the effect of OCRs and product attributes (i.e., brand, price, and technical attributes) to customers' choice probabilities, this study aims to address the stated gaps in the literature. Specifically, i) we decompose OCR into valence, volume, and variance and investigate their interactions, and ii) we examine the impact of OCRs on customers' valuation of brand, price, and technical attributes of products.

A unique feature of our study is that we investigate the effect of OCRs on customer choice in a comprehensive choice-based conjoint experiment ([Louviere & Woodworth, 1983](#)). One reason for the aforementioned mixed empirical findings in previous research might be that most existing studies are based on analyses of market data. Determining the effect of OCRs on customer behavior with market data may be difficult because of complex challenges such as endogeneity issues (e.g., [Amblee & Bui, 2011](#)), reviews by experts in parallel ([Ho-Dac et al., 2013](#)), concurrent marketing activities (e.g., advertising; [Chintagunta, Gopinath, & Venkataraman, 2010](#)), or the low frequency of OCRs providing poor evaluations ([Chevalier & Mayzlin, 2006](#)). Our choice-based conjoint experiment has the advantage of containing a balanced number of all relevant combinations of the OCR dimensions that account for the interaction effects among valence, volume, and variance. Our experimental setting further enables us to observe and analyze individual choice behavior instead of aggregated observed market data. Individual choice behavior conducted within an experiment does not suffer from endogeneity or other volatile marketing activities, such as advertising, because external effects are implicitly held constant during the experiment.

A few of our key empirical findings are as follows. By contrast to other studies, our results show that volume and variance operate as moderators of valence and that they do not have a direct effect on customer choice. Only valence exerts the expected direct effect on customer choice behavior in our experiment.

Furthermore, we find that OCRs reduce the influence of brand and price on customers' choices in our choice-based conjoint experiment. It seems that OCRs, as indicators of a brand's online reputation, reduce the impact of a brand's general reputation once they are displayed together. This finding indicates that OCRs present an emerging challenge for brand management in e-commerce. Brand managers should care about their online reputation, which can be enhanced by increasing the number of positive OCRs about their products or by building a loyal brand audience that stays with their brand because of the emotional benefits associated with it. Loyal customers may ignore other brands and may therefore simply disregard unfavorable OCRs related to their brand.

Our results are also of interest to managers, as they provide insight into the transformation of the online buying process since OCRs are available in nearly every online store. We investigate the changing impact of brands in such a digital environment and discuss options for handling OCRs.

Given the impact of prices in demand, the results indicate that OCRs reduce decision risk for customers, decreasing customers' price sensitivity and increasing customers' willingness to pay (WTP). On average, one additional rating star on a five-star scale (i.e. a one-unit increase in valence,) increases the WTP for an eBook reader by €48.96 (price range in our study = €99–€139).

The remainder of the paper is organized as follows. We next present the conceptual framework for our study, including related literature and hypotheses. Then, we describe our experimental setting and present the results of the empirical analyses. We conclude by discussing our results and by proposing directions for future research in the last section.

2. Conceptual framework and hypotheses

2.1. Online customer reviews

OCRs can be divided into two groups: qualitative and quantitative OCRs ([Sridhar & Srinivasan, 2012](#)). Qualitative OCRs provide a written description of the usage experience. In qualitative reviews, the customer is completely free to choose how to describe, criticize, and evaluate the product ([Jiménez & Mendoza, 2013](#)).

In the case of a quantitative OCR, the customer is forced to summarize his or her evaluation in a single rating or grade, and the single ratings from customers are usually pooled together into a summary statistic. This paper focuses on quantitative OCRs.

According to [Chintagunta et al. \(2010\)](#), a quantitative OCR can be decomposed into the following three elements:

1. Valence, which is the average rating and represents average customer satisfaction;

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