



# Understanding online product ratings: A customer satisfaction model



Tobias H. Engler\*, Patrick Winter, Michael Schulz

Philipps University at Marburg, School of Business & Economics, Universitätsstr. 24, 35032 Marburg, Germany

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## ABSTRACT

Online product ratings have become a major information source for customers, retailers, and manufacturers. Both practitioners and researchers predominantly interpret them as a reflection of product quality. We argue that they in fact represent the customer's satisfaction with the product. Accordingly, we present a customer satisfaction model of online product ratings which incorporates the customer's pre-purchase expectations and actual product performance as determinants of ratings. We validate our model by applying it to two datasets collected at the German website of [Amazon.com](http://Amazon.com). The results indicate that both factors have a significant influence on online product ratings, supporting the proposed interpretation of ratings.

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## 1. Introduction

Along with the growing diffusion of e-commerce, online product reviews have become a major information source for customers, retailers, and manufacturers. On the one hand, reviews and ratings contributed by online shop customers provide product information for prospective consumers, thereby reducing their uncertainty about the product (Chen and Xie, 2008). Consistently, research has shown that they affect sales in various contexts (e.g., Chevalier and Mayzlin, 2006; Lin et al., 2011; Park et al., 2007). On the other hand, online retailers and manufacturers increasingly rely on customer feedback to enrich their marketing strategy (Chen and Xie, 2008; Cui et al. 2012), to adjust product listings (e.g. via relevance sorting), and to create additional revenue streams (Mudambi and Schuff, 2010). For these reasons, it is not surprising that nearly all major online retailers such as [Amazon.com](http://Amazon.com) or [Ebay.com](http://Ebay.com) have implemented product rating functionalities.

Researchers, mainly from the fields of marketing and information systems, have adopted the topic and not only started to study the effects of online product ratings (e.g., on sales) but also their nature and determining factors. A common assumption of prior studies in the latter stream is that the baseline of a product's online ratings reflects its true quality. Various biases such as social dynamics or cultural influences were introduced to account for the unexplained part of the variance. However, empirical evidence suggests that online ratings do not accurately reflect a product's

true quality (e.g., Hu et al., 2006; Koh et al., 2010). Since the influence of ratings on sales remains unaffected, retailers are left in an uncomfortable situation: it is difficult for them to adjust marketing strategies on the basis of online product ratings without knowing what they actually reflect.

Hence, the objective of this study is to find out what really builds the baseline of online product ratings and thereby refine their current interpretation. We argue that the weak explanatory power of product quality for online reviews is not only caused by actual biases: it is mainly caused by product ratings reflecting customer satisfaction than being a valid measure for product quality. This approach does not solely rely on product quality as the baseline for the rating but also integrates the customer's expectation of the product in the pre-purchase phase. Correspondingly, we present a customer satisfaction model of online product ratings based on the considerations of Fornell (1992) and Westbrook and Reilly (1983). We model the customer's pre-purchase expectation of the product and the actual performance as predictors of online ratings using structured equations. We validate our model by applying it to two datasets (digital cameras and televisions) collected from the German website of [Amazon.com](http://Amazon.com). The results indicate that both a customer's expectation of a product and the actual performance significantly influence the ratings customers assign to a product, supporting the proposed interpretation of online product ratings.

Several other observations in the datasets can help to get a more comprehensive view of online product ratings and are worth mentioning. First, we find that online ratings carry some percentage of unobservable information that cannot be predicted (using metrics from the website). Second, the data shows indications for confirmation, acquisition, and under-reporting biases.

\* Corresponding author. Fax: +49 6421 2826554.

E-mail addresses: [tobias.engler@wiwi.uni-marburg.de](mailto:tobias.engler@wiwi.uni-marburg.de) (T.H. Engler), [patrick.winter@wiwi.uni-marburg.de](mailto:patrick.winter@wiwi.uni-marburg.de) (P. Winter), [michael.schulz@wiwi.uni-marburg.de](mailto:michael.schulz@wiwi.uni-marburg.de) (M. Schulz).



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