

Understanding of Customer Decision-Making Behaviors Depending on Online Reviews

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Abstract

In the vast realm of online reviews, consumers are confronted with a constant influx of both positive and negative evaluations. The specific reviews a consumer encounters play a pivotal role in shaping their perception of a product. This research focuses on understanding the nuanced relationship between the textual and numerical aspects within reviews, aiming to shed light on the decision-making processes influenced by these reviews.

The study systematically explores consumer decisions in response to the review structure, combining star ratings and comments. Two fundamental research questions guide our investigation: (1) how consumers compare two products based on reviews, (2) the individualized perceptions formed by consumers about a product in light of accompanying reviews.

Through a user study, we find that consumers exhibit distinct patterns of review consideration based on the presentation conditions of the product. Notably, during product comparisons, star ratings wield a greater influence on consumer decisions, while the evaluation of individual products leans more heavily on the impact of comments. Furthermore, consumers in the pre-purchase phase scrutinize star ratings with a more discerning eye compared to those who have already completed a purchase.

1 Introduction

The contemporary digital landscape is inundated with a multitude of reviews spanning a wide array of products and services, encompassing both tangible items like fans and vacuum cleaners, as well as intangible consumer experiences such as concerts and movies. These reviews, predominantly generated by consumers

themselves, wield significant influence over purchasing decisions. Consumers inherently find peer-generated reviews more trustworthy and engaging than information disseminated by vendors, as they emanate from individuals who have firsthand experience with the products. For companies, these reviews serve as valuable insights into consumer perspectives, prompting many businesses to integrate online reviewing into their strategies as an effective means of engaging and influencing consumers directly.

The vast diversity of reviews stems from the subjective nature of consumer perceptions, resulting in a myriad of perspectives even for a single product. A previous study confirmed that the impact of review data varies depending on the consumer's expectations for the product. Consumer types exhibit differences in vulnerability to negative reviews and susceptibility to selection biases. For user types where review reliability is deemed significant, factors such as the source of the review also come into play. While sellers naturally aspire to cultivate positive perceptions of their products, an excessive emphasis on favorable reviews, often observed, is not conducive to consumer interests. The essence of reviews lies in their transparency and impartiality.

Companies typically implement user reviews with two primary components: numerical ratings (e.g., one to five-star ratings) and textual comments. Platforms like Amazon, Walmart, and Movietickets display star ratings and comments together. However, the relative significance of these review components, whether star ratings or comments, remains ambiguous in the eyes of consumers. Do consumers prioritize consumer goods with high star ratings but lackluster comments, or is the reverse true? What considerations guide consumers when evaluating star ratings for their purchase decisions? This

paper undertakes an exploration of consumer decision-making when presented with both review components concurrently. Consequently, our user study devised two tasks to simulate consumer reading and interpretation of reviews. The outcomes of our study revealed distinct disparities in the perceived importance of review components based on the intended purpose of their examination.

2 Background

User reviews generally involve two components: a numerical rating and a textual comment. Numerical ratings are assigned by evaluators to assess specific attributes. Various rating scales have been developed for numerical review systems, with two primary types prevailing on high-traffic websites: binary thumbs-up/thumbs-down and one to five-star ratings. Binary ratings lack neutrality, forcing evaluators to choose between "good" or "bad" without providing a measure of intensity. In contrast, the one to five-star system, widely used in commercial online reviews, conveys a more nuanced evaluation through a higher number of stars indicating a more positive rating. Numerical reviews offer the advantage of quantifying assessments, enabling more precise comparisons. While the interpretation of star ratings may vary among evaluators, the relatively small deviations result in a distribution roughly following a normal curve. Consequently, star ratings are often averaged to produce a single numerical score.

Text reviews, on the other hand, capture qualitative information that cannot be effectively conveyed through numerical ratings. Due to their subjective nature, text reviews exhibit significant variation. Evaluators may assign the same numerical rating to a product while providing vastly different text reviews. Moreover, text reviews are more prone to subjective interpretations. For instance, one evaluator might give a four-star rating accompanied by the comment "this product was very good," while another might use the same four-star rating but state, "this product was somewhat disappointing." As a result, the diverse range of text reviews for a product cannot be easily summarized or averaged. The current practice employed by most companies is to display text reviews based on their popularity or recency. However, relying on these factors can introduce randomness or bias into the presentation of reviews.

3 Research Question

In light of the pivotal role played by online reviews in consumer decision-making, this study delves into user selection patterns across various combinations of star ratings and comments.

The primary objective is to enhance our understanding of the consumer decision-making process, particularly in scenarios where the goal is to present enticing reviews or establish trust through the provision of reviews. To achieve this aim, two specific research questions were crafted based on the intended purpose:

1. Firstly, in the decision-making between two alternatives, we explored whether the star rating or the comment exerted a more significant influence on consumers.
2. Secondly, when presented with a single product accompanied by both a star rating and comments, we investigated how users navigate their choices.

Formulating hypotheses aligned with these research questions, our study aims to unravel how consumers interpret the amalgamation of star ratings and reviews.

Hypothesis H1: In a binary selection situation, when star rating and reviews are oppositely given, the option with a high star rating will be chosen to prevail.

Hypothesis H2: In a single selection situation, deciding on a single subject alone, review data will be considered to be more important than star rating.

4 Overview

We devised two tasks aligned with each research question. The participants were chosen through non-probabilistic sampling, specifically employing chain-referral sampling, considering the challenge of securing subjects representative of the experimental population. A total of 26 participants were enlisted through announcements posted on social networking services and within the university community. The average duration of the experiment for each participant was approximately 20 minutes. The experiment was conducted offline.

Demographic information about the participants is succinctly outlined in Appendix A. Notably, this study deliberately excluded personal preferences or traits related to products. To mitigate potential biases linked to age, gender, and social status were deliberately omitted in the experiment. The testbed's development and the study for experiment progression were carried out in the October-November 2023.

5 Task Designing

5.1 Task 1: Binary selection

Every day, consumers engage in the process of comparing products based on both star rat-

ings and comments. The selection between two items serves as a simplified yet insightful representation of the broader decision-making process involved when confronted with multiple options. The experimental task set out to explore decision-making dynamics in the context of selecting between two commodities, each accompanied by a review—consisting of a one-to-five-star rating and a few comments. Two distinct types, denoted as Type A (comprising a positive textual review and low star ratings) and Type B (negative textual reviews paired with high star ratings).

To conduct the experiment, a slide deck was prepared, featuring six items with two items per page. Each page juxtaposed one item from Type A with another from Type B. Care was taken to choose items from a similar category for comparison, and their prices were maintained at nearly identical levels to eliminate any potential bias related to pricing. Participants were tasked with navigating through the slide deck and responding to questions that probed their binary selection preferences, specifically focusing on which the review factor influenced their choices in a simultaneous manner.

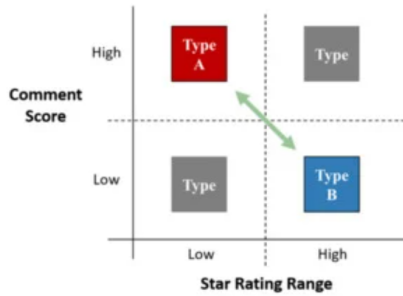


Figure 1: Representation of Type A and Type B

5.2 Task 2: Decision on a Single Product

In contrast to the comparison between two alternatives, this particular task is structured to assess the preference for a product when presented with a star rating and comments for a singular item, akin to a like/dislike rating system. This scenario replicates the experience of a consumer reading reviews for a standalone product showcased on a single page, allowing for a more focused examination of the product. To execute this task, participants were furnished with a star rating and a few comments pertaining to a randomly chosen item. Similar to Task 1, a slide deck containing six items, with each item on an individual page, was prepared. Par-

ticipants navigated through the slide deck and responded to inquiries regarding their product preference in a binary selection format, considering the simultaneous influence of the review factor on their choices.

6 Results

6.1 Task 1: Binary selection

We generated both a heatmap and a bar graph (fig 2,3) to illustrate the factors influencing people’s choices in binary selection. In general, Type B exhibits a slight predominance over Type A. Notably, Type B is characterized by a combination with a high star rating. Observing participant behavior during the task, it became evident that they tended to prioritize the star rating when making decisions. Consequently, when interpreting the results in comparison to the established assumption (H1), while the assumption generally held true, it wasn’t universally accepted in all instances. This outcome implies that, when faced with the decision of choosing one among two or more products, participants were more significantly influenced by the quantitative review represented by the star rating.

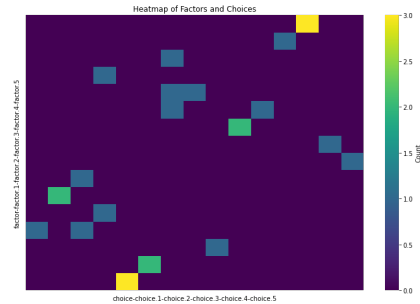


Figure 2: Heatmap of choices and factors affecting them.

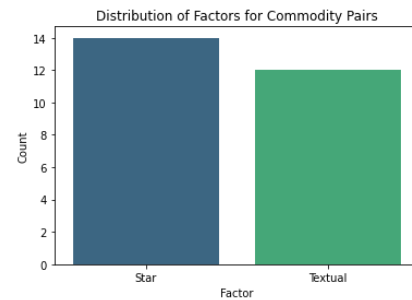


Figure 3: Bar graph representing factors affecting decision making

6.2 Task 2: Decision on a Single Product

The comment score is a quantitative measure assigned to assess the sentiment or quality of a textual comment associated with a product or service. This score typically ranges from 1 to 5, where a higher score indicates a more positive or favorable comment, and a lower score reflects a more negative or unfavorable comment. The purpose of assigning a comment score is to offer a numerical representation of the subjective information conveyed through user comments, facilitating a more structured and measurable analysis of qualitative feedback.

In the context of evaluating a single product, CS factor emerges as a more influential determinant. Notably, preference values experienced more pronounced increments with an elevation in CS compared to when the star rating increased. Even in instances where a commodity boasted a high star rating, it wasn't necessarily 'liked' if the CS was low. Conversely, despite a low star rating, a commodity stood a better chance of being 'liked' if the CS was high. Furthermore, the effect on preference due to an increase in CS surpassed the impact of a corresponding increase in star rating. Consequently, the hypothesis posited for a single selection scenario (H2) finds support, underscoring that review data exerts a more significant influence on decision-making.

This observation suggests that the preference, whether positive or negative, for an individual product is more profoundly shaped by subjective information in the form of comments rather than numerical star ratings.

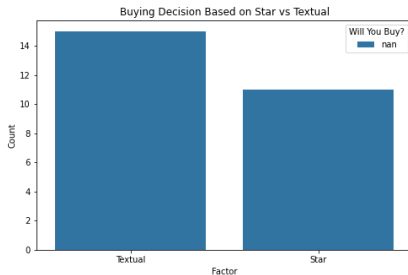


Figure 4: Bar graph representing factors affecting decision making

7 Limitations

In this study, we aimed to understand consumer decision-making behaviors towards commodities by focusing on star ratings and comments as primary influencing factors. However,

limitations include the omission of user characteristics and state data, such as gaze and biometrics. Utilizing these elements could provide valuable insights into user interactions. The study used sentiment analysis to explore emotions associated with different score ranges, but constructing comment data based on emotional similarity doesn't entirely eliminate confounding factors. Additionally, the study acknowledges the challenge in accurately interpreting diverse expressions, including sarcasm, in reviews. The exclusion of such expressions and emotions poses limitations, suggesting potential areas for further experimentation in natural language processing techniques. In conclusion, while offering insights into consumer decision-making, the study recognizes the need to address these limitations for a more comprehensive understanding of consumer behaviors towards commodities.

8 Conclusion

This paper sought to examine how individuals perceive and respond to reviews featuring star ratings coupled with comments. Through user behavioral and sentiment analysis, we explored the decision-making dynamics in scenarios involving the choice between two commodities, the evaluation of a single commodity, and the interplay between comments and star ratings. Initial exploratory data analysis confirmed the applicability of commodity review data, leading to the design of two user studies involving 26 participants. The study revealed that consumers attribute different values to star ratings and comments, influenced by the specific context in which they are presented (experiments 1 and 2). In the context of choosing between two commodities, the star rating tended to have a greater impact on preferences. However, when assessing a single commodity based on its ratings and comments, the decision to 'like' or 'dislike' was more significantly influenced by comments. Furthermore, consumers exhibited a stringent approach when expressing positive sentiment toward star ratings, particularly when adopting a consumer perspective rather than a reviewer perspective. This study aims to contribute insights into understanding consumer perception patterns regarding star ratings and comment reviews, potentially informing the development of more effective review structures.

9 Literature review

The literature review comprises a collection of studies investigating diverse aspects of consumer behavior and decision-making processes in the context of online commerce. Chen et al. (2017) explore customers' purchase decision-making processes in social commerce, empha-

sizing a social learning perspective. Lee et al. (2008) delve into the impact of negative online consumer reviews on product attitudes, employing an information processing view. Blaze-
vic et al. (2013) extend the understanding of customer-driven influence beyond traditional word-of-mouth. Dellarocas et al. (2007) focus on the value of online product reviews in forecasting sales, specifically in the case of motion pictures. Maslowska et al. (2017) investigate the role of customer reviews in driving purchase decisions, considering the moderating effects of review exposure and price. Tsao (2014) explores the persuasiveness of different types of online reviews, comparing the influence of consumer reviews and critic ratings on moviegoers. Bae and Lee (2011) examine the relationship between product types and consumers' perception of online consumer reviews. Lastly, Donthu et al. (2021) conduct a systematic review and bibliometric analysis, mapping the landscape of electronic word-of-mouth (eWOM) research. This concise literature review encapsulates a broad spectrum of research endeavors contributing to the understanding of consumer behavior in the online environment.

10 Appendix

Below are the demographics of our study:

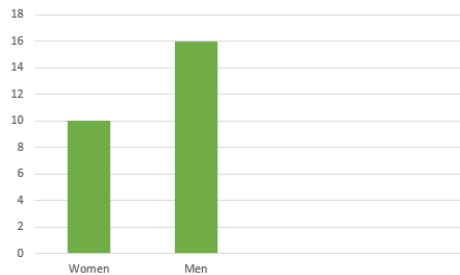


Figure 5: Gender distribution

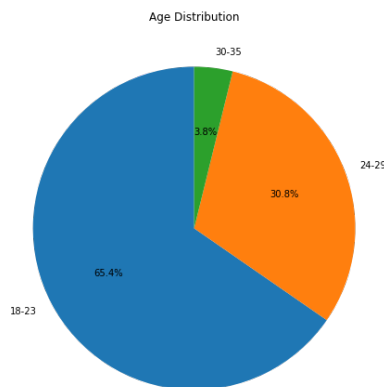


Figure 6: Age distribution

11 References

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