

EXPLORING THE PATTERNS IN CONSUMER REVIEWS IN A TRAVEL WEBSITE

PradeepRacherla, College of Business, West Texas A&M University, 2403 Russell Long Blvd, Canyon, TX 79016, (806) 651-2502, pracherla@mail.wtamu.edu

Daniel J. Connolly, Daniels College of Business, University of Denver, 2044 East Evans Avenue, Denver, CO 80208, (303) 871-4278, connolly@du.edu

ABSTRACT

This study explores the patterns and features of online reviews extracted from a popular closed-system travel-related website featuring vacation rental properties. Factors such as numerical rating distribution, quality and quantity of information in the reviews, and attributes of the reviewed properties are considered. The analysis revealed that reviews are heavily skewed towards positive ratings; in this study, there was a paucity of moderate and negative reviews. The correlation between review rating and ratings of individual attributes is very low suggesting that the overall numerical ratings typically used in review systems may not be the ideal indicator of service quality and customer satisfaction. The implications of this study for research and practice are discussed.

Key words: online word-of-mouth, eWOM, online consumer reviews, rating distribution, vacation rental, travel sites

INTRODUCTION

Online reviews have become important sources of information for travelers ever since the Internet permeated the tourism and hospitality industry. Consequently, there has been a proliferation of online reviews sites such as TripAdvisor.com and Hotels.com. However, the existing academic understanding of online reviews in the travel and hospitality domain is relatively weak. Recently, some studies have explored this interesting phenomenon [10] [15] [18] [17]. However, extant research has overlooked certain interesting aspects of online reviews. For example, online reviews typically use an overall 5-star (or 5-point) rating scale as the primary indicator of service quality and travelers' satisfaction levels, but, researchers have still not answered the underlying question: *Do the star ratings truly represent the quality of the service and the service provider itself?* This becomes an important question since star ratings are the primary attribute on which websites rank and display various properties and services. Additionally, few studies have analyzed the qualitative aspect of traveler reviews. Online reviews are essentially open-ended text-based communications between consumers. The textual content may contain a nuanced view of the services that cannot be expressed using crude numerical ratings. Finally, previous studies have overlooked the relationship between the reviews and various aspects of the services. Since online reviews are essentially word-of-mouth communications, it is possible that consumer involvement, pricing, and length-of-stay will have an impact on the final rating and review comments provided by the travelers.

This study attempts to address the above limitations. The primary research objectives that guided this study were the following: **1) to** explore the underlying patterns associated with the online reviews, **2) to** understand the associations within the various attributes of the rental properties and traveler reviews,

and 3) to analyze the text portion of the reviews using content analysis to identify and understand the issues that consumers talk about the most in their online reviews.

BACKGROUND

Review Rating Distribution

In online review sites, consumers are generally given the option to assign a star rating (using either a 1-5 or a 1-7 Likert scale) to rate a product and/or service. Due to the significance attached to the numerical rating, the numerical distribution of review ratings has been one of the most studied features of online review systems. However, these studies are based on the fundamental assumption that the numerical ratings assigned to a product and/or service provide accurate indicators of the quality and customer satisfaction. Yet, as some recent studies have revealed, this might not be the case. Dellaracos and Narayan's [4] study on movie reviews in Yahoo.com found a non-normal U-shaped relationship between customer satisfaction and the inclination to engage in word-of-mouth. This implies that only the extremely satisfied and extremely dissatisfied customers tend to publicly express their opinions while customers with moderate opinions are less likely to express their opinions. Similarly, studies using data from Tripadvisor.com (e.g., [14]) found that the distribution of the star ratings exhibits a truncated U-shaped curve.

H1: The star ratings of the reviews in Reviews.com will show an asymmetric U-shaped distribution. The number of reviews with extremely high and extremely low ratings will be greater than reviews with moderate ratings.

Researchers are yet to answer the question: *Do Star ratings truly reflect the quality of a service and the service provider?* This becomes an important question for two reasons. First, star ratings are the primary evidence that consumers consider while traversing online review sites for information to aid in their purchase decisions. Second, the truncated nature of rating distributions typically observed in online review sites means that reviews may not be the true representative sample of consumer opinion and product quality. For instance, if the first assumption is true, consumers should always look for reviews (and service providers) that have a 5-star rating. On the contrary, if the assumption is false, then consumers are better off parsing for reviews with a rating of 3 since these tend to be more balanced and enable better product diagnosticity. Recently, Hu et al.[7] using data from Amazon.com show that numerical score does not reflect true product quality. As Hu et al.[7; p.7] suggest, "...rather, the score reflects the balance of diverse opinions. In other words, when a book's overall score is around 3, it does not suggest that consumers generally agree that this is an average book. It rather suggests that there is a roughly equal number of consumers who think that the book is either an outstanding book or abysmal book."

H2: The star ratings may not be the true representation of vacation rental properties' service quality. The correlation between star rating and other attributes on which travelers rate the properties will be low.

Relationship between Ratings and Property/Review Attributes

To understand consumers' word-of-mouth behavior, it is important to consider various factors such as perceived expectations of costs and benefits, importance of the purchase (involvement), personal characteristics, and situational influences [3].

- Price: One of the factors that contribute to pre-purchase expectations is the importance that the consumers assign to the purchase. Price serves as a proxy measure for purchase importance. As Bearden et al.[2] show, the likelihood of word-of-mouth being triggered by the level of expectation-

disconfirmation increases with the cost of the product. Given the greater risk inherent in the exchange of expensive services, customers would seek more trustworthy properties with a good reputation of satisfying customer needs. This, in turn, increases the expectations and leads to more extreme reactions from the consumers.

- **Word Count:** The number of words in a review may serve as a proxy measure for the amount of useful information in online reviews and a customer's overall level of satisfaction (or dissatisfaction). A review is an argument made by a reviewer to either encourage or dissuade consumers from buying a particular service. Recent studies (e.g., [16] [17]) suggest that quest for social approval, the need to help others, and the desire to control the quality of the service are some of the most important psychological incentives that drive consumers to write online reviews. These factors will determine the amount of time and effort a review writer is willing to expend in providing a detailed account of his/her experiences.
- **Recency:** Previous research suggests that consumers' feedback in product/service reviews tend to be more positive as more time lapses between time of consumption and time a review is written. This may happen due to multiple reasons. For example, it is more difficult for consumers to evaluate the performance of services, and as time lapses, consumers tend to be more forgiving and forgetful. Simply put, negativity fades with time. Also, complaining provides a vent for the customers' negative feelings, which can, at times, lead to an increase in satisfaction [11]. Consumers tend to view favorably the very fact that the service provider has opened up an avenue of communication which helps to decrease feelings of negativity.

H3: There is a strong correlation between negative rating and property pricing. The higher the price, the higher will be the negative ratings.

H4: There will be negative correlation between review rating and word count. Reviews with negative ratings will have a higher word count when compared to reviews with positive rating.

H5: There will be negative correlation between recency and negative ratings. The greater the difference between the date of stay and the review, greater will be the star rating.

DATA, ANALYSIS AND RESULTS

Research Setting and Data

This study is based on the reviews collected from 'Reviewsite.com' (pseudonym), a community-driven travel advisory site focused on vacation rental properties. The closed-system site provides reviews of verified vacation rental stays and organizes property listings based on their reputations and number of positive reviews. The website owner provided 3,297 consumer reviews posted on the website. After initial data cleaning, 100 reviews were eliminated due to incomplete or unusable information, leaving a sample size of 3,197 reviews for analysis in this study. Each review contained the following attributes: a) consumers' overall star rating, b) consumers' rating on 6 attributes: value, cleanliness, comfort, service, location and check-in, c) the review text (i.e., free-form comments), d) age range of the guest (reviewer) on an 1-4 ordinal scale (25-34, 35-44, 45-54 and 55 & above), e) recency or the time difference (in weeks) between the date of stay and the date of review, and f) the average accommodations rental price per day. A separate variable called 'word count' was created by calculating the number of words in each review.

Quantitative Analysis

To test hypothesis 1, the authors ran a simple frequency chart. The distribution of the ratings is shown in Figure 1. As the results indicate, the distribution is heavily skewed towards the positive ratings (82% > 3

and 18% =<3). While this result is concurrent with some of the studies mentioned above, the distribution, as shown in Figure 1, shows a J-shaped distribution rather than a U-shaped distribution. Kolmogorov-Smirnov test of normality was also applied to the data to check for normality assumptions. Three conclusions can be drawn from this result. First, industry anecdotal evidence suggests that there is generally high satisfaction, loyalty, and repeat usage among vacation rental patrons and a strong preference to use these types of accommodations over other lodging accommodations due to the overall quality of the product, the price-value relationship, additional space, and amenities. Most of the properties listed on the website are reputable and of high quality, offering upscale services and amenities to travelers. While this may be true for some properties, it is a weak argument when applied to all the properties [8]. Second, reviews available on the website may not be a representative sample of consumer opinion. Consumers may be exaggerating, thereby inflating their polarized views against the instinct to provide moderate opinions [1]. Third, the truncated distribution may also be a function of the review soliciting strategy adopted by Reviewsite.com. The firm uses a closed system, one in which people must be invited to make a posting based upon an actual, verified guest stay. In contrast, open systems used by TripAdvisor and others allow anyone to post and make no attempt to verify an actual stay occurred. Recent studies [5] suggest that customers engage in socially desirable behavior even in impersonal interactions with the service providers. In this case, they provide reasonably positive reviews even if their experiences have not met expectations.

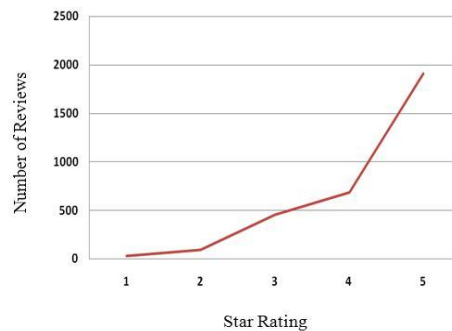


Figure 1: Distribution of the 'Star Rating'

To test hypothesis 2, the authors ran a regression equation with the 6 property attributes as independent variables and star rating as the dependent variable (see Table 1). This analysis was based on the assumption that if star ratings truly represent the quality of the properties, then the star rating and ratings of the 6 other property attributes will show perfect (or at least very high) correlation. The reviews were divided into two categories, 'High' reviews with star rating above 3 (n=2,597) and 'Low' reviews with rating below or equal to 3 (n=600). An interesting finding is the gap between the attribute ratings and overall star rating for each property. However, the data reveals that the R-square of the regression with all the six variables and the overall star rating is less than 40%. In other words, even if the consumers provided higher ratings on individual attributes, their overall rating was usually low and vice versa. This trend was detected in both 'High' and 'Low' reviews.

Table 1: Regression Analysis of 'Low' and 'High' Reviews

	Low Reviews	t-value	High Reviews	t-value
(Constant)	1.618	18.353***	2.400	34.186***
VALUE	0.254	13.726***	0.378	8.767***
CHECKIN	-0.083	-3.701	-0.053	-1.192
LOCATION	0.104	6.132	0.079	2.117
CLEAN	0.144	7.574***	0.112	2.808***
COMFORT	0.267	13.993***	0.129	3.088***

SERVICE	0.098	4.209**	0.107	2.401
R²	0.331		0.338	
F-Statistic	50.38		247.14	

The analysis suggests not all attributes are equally important for the travelers. Based on the results, it can be assumed that value-for-money, cleanliness, and comfort were the most important attributes that drive the positive or negative ratings.

To test the hypotheses from 3 to 5, the authors ran a series of ANOVA (see Table 3). Table 6 shows certain interesting results. The data supports the hypotheses that price and word count show a significant negative correlation with star rating variable. Reviews with lower ratings are typically associated with greater word count and represent properties that charge high rates. Due to space limitations, only the result on word count is shown in Figure 2. The result on the word count suggests that consumers who are unhappy with the vacation rental property tend to write more to express their dissatisfaction. As shown in this figure, lower ratings are associated with higher number of words in the review and vice versa.

Table 2: Results of ANOVA with Word Count, Price, and Recency

		Df	Mean Square	F	Sig.
WORD COUNT	Between Groups	4	274789.2	70.21	0.001
	Within Groups	3180	3914.0		
	Total	3184			
PRICE	Between Groups	4	98652.5	4.88	0.001
	Within Groups	2192	20230.1		
	Total	2196			
RECENCY	Between Groups	4	242.0	3.12	0.014
	Within Groups	3180	77.5		
	Total	3184			

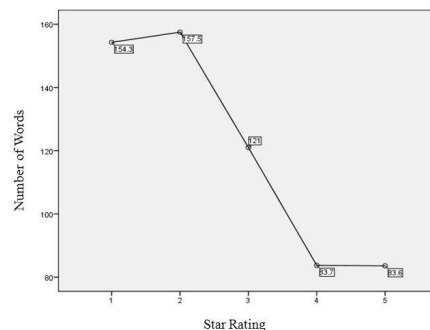


Figure 2: Differences in Mean Word Count Across Star Ratings

Semantic Analysis of the Review Text

Semantic analysis of the textual content provides us with an opportunity to understand an important question: *What do consumers want and what do they talk about?* To this end, 600 ‘High’ and 600 ‘Low’ reviews were randomly selected and used for semantic analysis. Table 3 shows the main issues/aspects that are prominently discussed in the reviews. The order of these issues is based on the statistically significant frequency of their occurrence in the reviews studied. A comparison of the occurrence of sentiment words in both types of reviews is shown in Table 4. As one would expect, extremely positive sentiment words such as great, wonderful, amazing, etc. are more likely to be associated with the property and its features in the ‘High’ reviews when compared to the ‘Low’ reviews, which typically featured words having negative connotations like disappointed, discomfort, filthy, etc. Additionally, almost 40% of the consumers in the ‘High’ reviews expressed their willingness to return to the property as opposed to only 9% of the consumers in the negative reviews.

IMPLICATIONS

The results have important implications for both research and practice. First, it is important for travel sites to consider some of the above mentioned biases that exist in the review systems. These biases add to consumers' cognitive overload that results from overwhelming choices and information. Recent evidence [6] suggests that travelers are gradually defecting from online travel sites due to some of the above mentioned reasons. Travel site administrators as well as property managers should take steps to attract those consumers who are willing to provide balanced analysis of the amenities and services. Steps should be taken to understand review writing behavior of consumers, and strong incentives should be developed to attract more balanced reviews.

Table 3: Top 5 Prominent Issues in 'Low' and 'High' Reviews

‘LOW’ REVIEWS		‘HIGH’ REVIEWS	
Prominently Mentioned Features	Freq	Prominently Mentioned Features	Freq
Bedroom, Beds, linen, Sheets	383	Beach, Beaches, Beachfront	506
Kitchen, Kitchenware, Dishes, Dishwasher	297	Pool, Poolside	218
Beach, Beaches, Beachfront	296	Location	192
Pool, Poolside	218	Bedroom, Beds	186
Bathroom(s), Bath, Bathtub, Shower	202	Kitchen, kitchen ware, dishes, dishwasher	178

Table 4: Occurrence of Sentiment Words

Sentiment words	High Reviews	Low Reviews
Great, Wonderful, Awesome, Terrific, Perfect, Loved	948	340
Nice, Good, Okay	391	449
Comfortable, Relaxing	161	102
Disappointment, Discomfort, Uncomfortable	26	120
Dirty, Bad, Filthy, Filth, Inoperable	36	274
Definitely return, like to Return, Comeback again	249	54
Definitely recommend, Recommend, Recommendation	106	32

Second, travel sites can develop better methods to aggregate, synthesize and publish the review contents including the numerical ratings. Currently, review sites show the average of all the ratings for a given property. However, such simple methods do not take into account the biases that are inherent in the rating systems. It is important to provide more information and heuristics to help the consumers navigate through the clutter and get the information they want and seek. Third, vacation rental property owners and managers should treat consumer review sites as listening posts and vehicles to gain important customer feedback, ideas for product/service improvements, etc. The content posted should be regularly monitored and mined. Future research should explore consumers' motivation to write online reviews in travel sites. Recent studies (e.g., [18]) do uncover various antecedents of review writing behavior but suffer from a sampling bias since they survey a self-selected sample of consumers who had already provided reviews. As the results indicate, under-reporting bias (lack of moderate and low rated reviews) is still prevalent in online review sites. Future research should investigate this interesting phenomenon and identify socio-psychological factors that increase consumers' propensity to write reviews.

REFERENCES

A set of references is available upon request from PradeepRacherla (pracherla@mail.wtamu.edu).