

# When Local Praise Becomes Cheap Talk – Analyzing the Relationship between Reviewer Location and Usefulness of Online Reviews

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**Abstract.** With a growing number of online reviews, it becomes increasingly important for customers and online review platforms to find groups of reviewers who write useful reviews. Customers who review local offline businesses such as restaurants can identify themselves as locals or travelers and thus implicitly assign themselves to a specific reviewer group. This study investigates the relationship between identifying as a local and the perceived usefulness of their online reviews. Using data from Yelp.com, we empirically test hypotheses derived from attribution theory. Our results suggest that neutral and negative reviews by locals tend to be perceived as more useful than reviews by travelers. Positive reviews by locals, however, are not perceived as more useful. These findings provide significant practical implications for online review platforms and local offline businesses.

**Keywords:** Online Reviews, Geographic Location, Causal Attribution

## 1 Introduction

Online review systems represent a core component of today's e-commerce landscape. Consumers increasingly support their decision-making process using reviews published by previous consumers [1]. While aggregated measures such as the average rating or total number of all reviews facilitate consumers' search for businesses [1], single reviews, and the textual content in particular, can also contain valuable information. Faced with the growing amount of online reviews which can complicate the searching process and actually increase search costs, online review systems aim to reduce the information asymmetry and search costs for consumers. For this reason online review systems frequently offer the option to vote for a review as being useful/helpful to indicate whether the textual information in a review is particularly valuable. Other users can then observe the number of votes and focus on useful reviews which reduces the effort they need to invest in the search process. This, in turn, means that online review platforms and customers need to identify characteristics of useful reviews or reviewers.

Research suggests that reviewer characteristics significantly influence perceptions of usefulness [2, 3]. For instance, if a reviewer has provided her real geographical location, her reviews are perceived as more useful [3]. For local offline businesses, e.g.,

restaurants, the information on the geographic (home) location of a reviewer can distinguish locals from travelers. Intuitively, this information can be a signal for being knowledgeable about a location. Nevertheless, no research has so far investigated whether reviews by locals are more valuable to readers than reviews by travelers. To this end, we aim to answer the following research question:

*Are there systematic differences between the perceived usefulness of reviews written by locals and the perceived usefulness of reviews written by travelers?*

We develop empirically testable hypotheses based on attribution theory (e.g., [4]) and the discounting principle [5]. To test our hypotheses, we use a comprehensive data set containing restaurant reviews from Yelp.com. Our results suggest that being a local is indeed associated with an increase in perceived usefulness of a review. Interestingly, we find this increase only for neutral and negative reviews written by locals but not for positive ones and attribute this finding to the discounting principle. Thus, we contribute to existing research by examining the impact of geographical location as a reviewer characteristic and by explaining a part of the negativity bias (e.g., [6]), which is often discussed in this stream of literature. In the conclusion, we discuss practical implications for online review platforms and businesses.

## **2 Related Literature**

Research on the perceived usefulness of online reviews has mainly focused on two features, namely review characteristics and reviewer characteristics [7]. Review characteristics consist of the review's text and its associated rating. For instance, reviews with a negative rating are perceived as more useful than those with a positive rating because readers attribute positive ratings to the reviewer's personal reasons, which is referred to as negativity bias (e.g., [6]). Review texts, which contain cues that indicate a short time period between consumption and publication of the review for example, lead to a higher perceived usefulness for reviews with a positive rating and to a lower perceived usefulness for reviews with a negative rating [6].

The characteristics of the reviewer also affect perceptions of usefulness. Characteristics that are directly observable to the reader can enhance or weaken the reviewer's credibility. The disclosure of personal information (e.g., real name, hobbies, location) or badges awarded by the platform (e.g., Amazon's top reviewer badge) make the reviewer more credible and thus increase perceived usefulness [2, 3]. It has been shown in an experimental setup that sharing the same geographical location as the reader creates a common ground and increases perceived usefulness as well [8]. There also exists experimental evidence that, regardless of being a local or a traveler, exhibiting local knowledge in one's review text is associated with an increase in perceived usefulness [9].

However, to the best of our knowledge, there is no research yet that has analyzed home locations of reviewers and explored the relationship between being a local, review valence and perceived usefulness. We contribute to the literature on reviewer

characteristics by investigating how the visible home location of a reviewer affects the perceived usefulness of her reviews for local offline businesses.

### 3 Theoretical Background and Hypotheses

The influence of being a local on the perceived usefulness of a customer's reviews is twofold. First, having experienced different businesses in the vicinity, one can convey local knowledge through the review's text. Such individuals can be referred to as market mavens [10]. Market mavens possess valuable information on the market, are willing to provide others with this information and can be identified reliably by other customers [10]. Second, by revealing her geographical location (i.e., place of residence), a reviewer can easily indicate whether she is a local or a traveler. Depending on the online review system, readers of the review can then either directly observe the reviewer's location, as in the case of Yelp, or find it on the reviewer's profile, as in the case of Airbnb. Observing the reviewer's location may change the reader's general perceptions of the reviewer even when no local knowledge is present in the review's text. Thus, even if a reviewer does not convey any local knowledge through the review's text, readers could still believe the reviewer to be knowledgeable about the area, consequently assess her as a credible source, and find her reviews more useful. Therefore, we argue that readers perceive reviews of locals as more useful.

*Hypothesis 1: Online reviews given by locals are perceived as more useful than online reviews given by travelers.*

Causal attribution theory suggests that readers attribute negativity in reviews to low product or service quality while they attribute positivity to the reviewer's personal reasons (e.g., [4]). Therefore, one needs to consider the valence of a review when developing hypotheses concerning reviewer characteristics. According to the discounting principle of causal attribution theory, consumers are less likely to attribute causes to the actual quality if there are valid external reasons for positivity or negativity [5]. In other words, if readers of reviews find a reason to believe that the reviewer's personal traits are the cause of positivity or negativity, they will discount their assessment of usefulness accordingly. We argue that a reviewer's geographical location is one such personal trait. Reviews by locals might be positive due to the shared connection with the location and therefore readers will attribute the reviewer's positivity to being local instead of high quality. Thus, readers of a positive review written by a local might perceive this review as less useful.

*Hypothesis 2: The positive relationship between the reviewer being a local and the perceived usefulness of her review is moderated by the positivity of the review, so that positive reviews by locals are perceived as less useful than positive ones by travelers.*

### 4 Research Setup and Data

We obtained data published by Yelp during the ninth round of the Yelp Dataset Challenge. On Yelp.com, consumers can review service-oriented businesses, from

restaurants to car mechanics. Yelp is suitable for our research context because it does not promote a clear focus on traveling like Trip Advisor so that both locals and travelers are likely to use Yelp. From this data, we extract the complete review histories up to the beginning of 2017 for five US cities: Champaign (IL), Las Vegas (NV), Madison (WI), Phoenix (AZ), and Pittsburgh (PA). In line with existing literature [7], we restrict our sample to each city’s top 10 restaurants in terms of total review count to ensure high levels of reader and reviewer involvement. The data also contains various reviewer- and review-related variables along with the review’s text. As the data set provides no information on the reviewers’ locations, we collected the current location for each reviewer manually in July 2017 to create a unique data set. We conducted this collection by matching each business’s reviews with reviews from our dataset.

**Table 1.** Descriptive Statistics on Review Level (N=72,759)

<b>Variable</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
<i>USEFUL</i>	0.941	3.001	0	247
<i>POSITIVE</i>	0.717	0.450	0	1
<i>NEGATIVE</i>	0.134	0.341	0	1
<i>LOCAL</i>	0.180	0.384	0	1
<i>RATING</i>	3.933	1.166	1	5
<i>EXTREMITY</i>	0.870	0.699	0	5
<i>WORDS</i>	122.623	111.709	1	981
<i>WORDS<sup>2</sup></i>	27514.986	62436.790	1	962361
<i>FUNNY</i>	0.481	2.250	0	166
<i>COOL</i>	0.601	2.632	0	234
<i>TEMP_CONTIGUITY</i>	0.020	0.141	0	1

Table 1 presents summary statistics for review-related data. To empirically test our hypotheses, we generate variables regarding location and review valence as well as various control variables. For each review, we compare the business’s location with the user’s location on a city level to identify whether the review was written by a local. The dummy variable *LOCAL* represents the result of this procedure. *USEFUL* is the number of users that have voted this review to be useful. Following previous work, we generate several review characteristics from the review’s rating and text. As ratings are given on a scale from 1 to 5, we define a positive review (*POSITIVE*) if a review has a rating of 4 or 5 and similarly define a negative review (*NEGATIVE*) if a review has a rating of 1 or 2 [6]. We create a measure for the review’s length in form of the count of words and add a squared term as well (*WORDS* and *WORDS<sup>2</sup>*) because lengthy reviews might be more useful but too long reviews might be less useful [2]. We also introduce review extremity (*EXTREMITY*) as the absolute difference of the review’s rating from the average rating of a business [2]. *TEMP\_CONTIGUITY* is a dummy variable that indicates whether the review text contains any cues that indicate a short period of time between consumption of the service and publication of the review [6]. We also dispose of the review’s rating (*RATING*) and how many users voted the review to be ‘cool’ or ‘funny’ (*COOL*, *FUNNY*). Examining reviewer-related variables, one can observe how many compliments (e.g., for having nice pictures) a reviewer has received from other

users, how many friends a reviewer has registered, how many other users are following a reviewer, how many reviews a reviewer has written, how many votes a reviewer has sent, and how many years a reviewer has been an ‘Elite Yelper’. Elite Yelper status indicates very active and reputable reviewers. On a restaurant level, we compute average ratings and review counts.

## 5 Empirical Analysis

Because our dependent variable (*USEFUL*) is a count variable that exhibits overdispersion and zero inflation, we use negative binomial regression and estimate Equation (1):

$$\begin{aligned}
 USEFUL_{ij} = \exp[ & \beta_0 + \beta_1 POSITIVE_{ij} + \beta_2 NEGATIVE_{ij} + \beta_3 LOCAL_i \\
 & + \beta_4 (LOCAL_i * POSITIVE_{ij}) \\
 & + \beta_5 (LOCAL_i * NEGATIVE_{ij}) + \gamma X_{ij} + \zeta Y_i + \xi Z_j + \delta_j \\
 & + \epsilon_{ij} ]
 \end{aligned} \tag{1}$$

In this model,  $USEFUL_{ij}$  represents the number of usefulness votes user  $i$  has received for her review on business  $j$ .  $X$ ,  $Y$ ,  $Z$  are vectors of review-, user- and restaurant-related control variables as described in Section 4, respectively. Additionally, we include restaurant fixed effects in form of vector  $\delta$ . Reviews with a 3-star-rating (i.e., neutral ones) are the base case in this model. Therefore, the coefficients have to be interpreted with respect to neutral reviews. For instance, a significantly positive  $\beta_3$  describes an increase in perceived usefulness for neutral reviews written by locals. A significantly negative  $\beta_4$  then indicates that positive reviews written by a local are less useful and that the impact of  $\beta_3$  is reduced by  $\beta_4$  (i.e., moderated). We also incorporate an interaction of *LOCAL* with *NEGATIVE* ( $\beta_5$ ), which again needs to be interpreted as a sum with  $\beta_3$  to examine the influence of negative reviews by locals.

Table 2 presents our preliminary results in form of estimated coefficients. First, the coefficient for *LOCAL* is statistically significant and positive while the coefficient for the interaction term *LOCAL\*NEGATIVE* is small and insignificant. This supports our first hypothesis since, according to these results, readers perceive neutral and negative reviews by locals as more useful than similar reviews by travelers. Second, the statistically significant, negative coefficient for the interaction term *LOCAL\*POSITIVE* indicates that positive reviews by locals, however, are not associated with a higher perceived usefulness. The sum of the coefficients for being a local and writing a positive review is 0.029 (0.124-0.0950). Thus, positivity moderates the increase in perceived usefulness due to being a local. This supports our second hypothesis.

We conduct a series of robustness checks to ensure validity of our results. First, the emotional tone a reviewer conveyed through her review text may affect perceived usefulness. One might argue that emotions associated with a restaurant visit differ for locals and travelers. Therefore, in line with previous studies (e.g., [11]), we use the text analysis tool Linguistic Inquiry and Word Count (LIWC) [12] to obtain a measure for the emotional tone in a review text. This measure seems to be robust to linguistic

aspects such as irony, since it is positively correlated with the review’s star rating. Our results remain qualitatively unchanged after we add this measure as a control variable. Second, our choice of top restaurants may influence our results. Therefore, we re-estimate our model for the top 20, 30 or 40 restaurants and get qualitatively unchanged results. Third, we validate our results by re-estimating our model for businesses of different categories such as “Nightlife”, “Bars” and “Beauty & Spas”, again with qualitatively unchanged results.

**Table 2.** Results from a Negative Binomial Regression (N=72,759)

<b>Variable</b>	<b>USEFUL</b>
<i>POSITIVE</i>	—0.0114 (0.0171)
<i>NEGATIVE</i>	0.250*** (0.0262)
<i>LOCAL</i>	0.124*** (0.0328)
<i>LOCAL*POSITIVE</i>	—0.0950** (0.0361)
<i>LOCAL*NEGATIVE</i>	0.0442 (0.0465)
<i>Review-level Controls</i>	✓
<i>User-level Controls</i>	✓
<i>Restaurant-level Controls</i>	✓
<i>Restaurant Fixed Effects</i>	✓

Note: Robust standard errors are in parentheses. \*p < 0.05; \*\* p < 0.01; \*\*\* p < 0.001.

## 6 Conclusion

Online shops and online review platforms strive to provide their customers with valuable information in form of reviews which customers perceive as useful. Literature suggests that reviewer characteristics (e.g., awarded badges or information disclosure) influence perceptions of usefulness [2, 3]. For local offline businesses such as restaurants, the geographical location of a reviewer conveys additional information to the reader as it indicates whether the reviewer is a local or traveler. We investigate the relationship between a reviewer’s geographical location and perceptions of usefulness. As hypothesized by attribution theory (e.g., [4]) and the discounting principle [5], our empirical results suggest that online reviews written by locals are perceived as more useful than those written by travelers. However, this holds only for non-positive reviews (below four stars). We argue that readers attribute positivity in locals’ reviews to their personal reasons (e.g., connection with the location, being a regular customer, positivity bias) and thus do not see being a local as a sign of credibility but more as a reason for doubt. These findings imply that online review platforms focusing on local offline businesses should highlight negative and neutral reviews by locals to guide their

users whereas businesses should address such reviews with carefully drafted management responses since these reviews receive additional reader attention.

We plan to extend this research in three major ways. First, we plan to further investigate this relationship in a controlled experiment to measure reviewer attribution (e.g., [6]) and investigate the role of the reader's origin. Second, we want to analyze how geographical distance (e.g., not being a local but coming from a location close to the business's location) relates to our results. Third, we want to separate the impact of local knowledge from the impact of credibility for being a local, for instance, by analyzing review texts for cues that demonstrate local knowledge.

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