

## **Effects of Emotional Certainty on the Perceived Usefulness of Online Reviews**

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**Abstract.** Scholars have conducted considerable research on perceived usefulness of online reviews, but less attention has been paid on the correlation between the emotion certainty and the perceived usefulness of online reviews. Therefore, the paper discussed the effects of the perceived usefulness of online reviews from the perspective of emotional certainty. Using the experimental research method of scene simulation verification, the study sample comprised 613 participants. Results show that the certain positive emotion (happiness) is more useful than the uncertain positive emotion (hope) regarding perception of online reviews; the reviews with certain negative emotion (anger) are more useful than those with uncertain negative emotion (worry).

**Keywords:** emotional certainty, perceived usefulness, online reviews

**AMS Mathematics Subject Classification (2010):** 68W27

### **1. Introduction**

While the development of the Internet has broadened the channels of online word-of-mouth communication, it has also raised the problem of information overload [1]. "Lost" in the sea of review information, consumers face difficulties in making decisions, which undoubtedly increases their purchase cost. Thus, it becomes crucial to identify useful information in the reviews quickly and efficiently.

As an important aspect of psychological research, emotions have gradually been applied to the study of consumer behavior, which were found to have a significant impact on the consumer behavior [2]. Although some scholars have studied the relationship between emotions and the usefulness of online reviews, their focus was on extreme emotions (anger, anxiety) [3, 4] or negative emotions [5]. As emotions are often uncertain, readers may have different perceptions about the usefulness of review information

containing emotional expressions. Nevertheless, the effects of emotional certainty on the usefulness of online reviews has rarely been explored.

In contrast to existing research, the paper discussed the perceived usefulness of online reviews from the perspective of emotional certainty. Specifically, the paper measured two groups of certainty and uncertainty emotions that I defined as (a) positive high-certainty emotion “happiness” and uncertain positive emotion “hope”; and (b) negative high-certainty emotion “angry” and uncertain negative emotion “worry”.

## **2. Literature review and hypotheses**

### **2.1. Emotional certainty**

The cognitive evaluation theory of emotions associates cognition with different human emotions [6], which considers emotions as the result of people's cognitive appraisal of specific events or contexts [7, 8]. Scholars have proposed several cognitive appraisal dimensions for distinguishing emotions, such as certainty, attention activity, controllability, anticipated effort, responsibility, pleasantness and valence, which are orthogonal and independent entities [6]. Thus, each dimension can be studied separately, the paper studied the dimension of certainty.

In the certainty dimension, emotions can be classified into certain and uncertain types. The cognitive evaluation theory of emotions holds that when people experience some emotions, they usually feel a certainty, who can understand what happens at the time, and rather assure what will happen next. Conversely, when people experience other emotions, they feel an uncertainty, who are unable to understand what happens at the time, and unsure what will happen next [9]. In particular, happiness, disgust, anger, etc. are certain emotions, while worry, fear, sadness, etc. are uncertain emotions [6].

### **2.2. Perceived usefulness of online reviews**

The research about the usefulness of online reviews, has been extensively studied. Existing researches on the perceived usefulness of online reviews can be classified into the following three categories: One is to analyze the effects of review score [10], valence (positive or negative reviews) [11], quantity, quality and content [12] on the perceived usefulness of online reviews by taking the characteristics of online reviews as antecedents; The second is to discuss the influences of reviewers' expertise [13], credibility and choice preference [14] on the perceived online review usefulness by taking the characteristics of reviewers as antecedents. Meanwhile, the third category explores the impacts of review reader characteristics on the perceived usefulness of online reviews [15]. In short, despite the in-depth researches on the factors affecting perceived usefulness of online reviews from different perspectives and affirmation of the importance of perceiving online review usefulness to the WOM communication and marketing behavior, few of these studies

## Effects of Emotional Certainty on the Perceived Usefulness of Online Reviews

have paid attention to the factor of emotion or discussed emotions, especially the relationship between emotional certainty and perceived usefulness of online reviews.

To study the effects of various emotions on the perceived usefulness of online reviews, the paper chose four emotions, namely the high-certainty positive emotion "happiness", high-certainty negative emotion "anger", uncertain positive emotion "hope" and uncertain negative emotion "worry", as the research object based on the cognitive evaluation theory of emotions. Studies have claimed that certain, affirmative comments are more influential than uncertain ones [16]. According to research on online word-of-mouth, the information certainty expressed through online word-of-mouth by consumers is more convincing than that by the experts [17] (Karmarkar & Tormala, 2001). Considering that influential and convincing information is deemed useful by consumers in the context of information search, the following hypotheses are proposed :

**Hypothesis 1:** In online reviews, consumers' perceived usefulness of reviews expressing certain positive emotion "happiness" is higher than the uncertain positive emotion "hope".

**Hypothesis 2:** In online reviews, consumers' perceived usefulness of reviews expressing certain negative emotion "anger" is higher than the uncertain negative emotion "worry".

### 3. Research design

#### 3.1. Experimental preparation

This paper tests the above hypotheses through scenario simulation. Perceived usefulness is set as the dependent variable. The manipulated independent variables include: positive emotions (happiness vs. hope), negative emotions (anger vs. anxiety). Each independent variable is manipulated at two levels. This experiment is conducted anonymously with the help of network platform. The advantage of network testing is that its anonymity is conducive to reducing the bias of social desirability, and the form of survey is also closer to the real online shopping scenario. With the assistance of online survey companies, 5,698 subjects were recruited, who were randomized into two groups for testing. After the test, a total of 1,540 questionnaires were collected. Through strict rejection procedures (e.g. abnormal personal information, excessively short fill-up time, answers showing obvious regularity), the number of subjects entering the analysis was finalized as 631. The test products in this experiment is laptop.

#### 3.2. Experimental process

The experimental design of this study is as follows:

Step one, experimental scenario design: Participants imagined that they were planning to purchase a laptop online, and were searching for relevant information on an

Yujie Li

online shopping platform. They saw a laptop that was satisfactory in all aspects in one store, but were unsure whether to buy it, because they wanted to see the product and its reviews from other stores.

Step two, review setting: The compilation of user reviews was based on the real review information about laptops and English dictionaries collected on shopping websites like Jingdong, Tmall and Amazon. Then, the selected review information was processed slightly with reference to Park et al.'s (2007)[18] method of defining the quality of reviews, which mainly involved controlling the length and valency of reviews to avoid deviations resulting therefrom. Next, manipulated independent variables were added to the processed reviews. Tab. 1 lists the processed reviews. Each participant was required to read the entire contents of positive reviews (reviews P1, P2, P3) and negative reviews (reviews N1, N2, N3) in turn.

Step three, scale setting: The dependent variables involved in this study were all measured with a scale. The scale, which was based on the mature scale used in previous studies, was modified slightly according to the scenario studied herein. Tab.1 shows the specific items of the scale.

Step four, basic information setting: By drawing from the previous research and the basic information of users surveyed by the China Internet Network Information Center, information like gender, age, occupation, education level, income status, network age, online shopping methods, online shopping expenditure, online shopping frequency, online shopping experience and frequency of reading online reviews were set.

Step five, questionnaire formulation: The scenario simulation experiment adopted in this study drew on the methods in the existing researches to put three reviews with three emotional strengths into one experiment (i.e. each participant needed to complete the evaluation of three reviews simultaneously). After reading each review, the participants needed to complete the items that measured the independent and dependent variables (items measuring the independent and dependent variables were the same after the three reviews). Finally, the measurement items for the participants' basic information were added.

### **3.3. Variable measurement**

Perceived usefulness, which is a continuous random variable, refers to a subjective perception of potential consumers as to whether the information provided in the online review texts is valuable in making a purchase decision by obtaining the exact information of product or service. The scale of perceived usefulness (5 items) was developed based on a study by Sen and Lerman [19]. The independent variables were grouped into three positive emotion groups (happiness group, hope group and no emotion group), as well as three negative emotion groups (anger group, anxiety group and no emotion group).

Effects of Emotional Certainty on the Perceived Usefulness of Online Reviews

**Table 1:** Processed reviews (e.g. Laptop)

Emotions	Reviews
Happiness	Y**6 (anonymous): After comprehensive comparison, I chose this laptop. It's easy to use, and looks nice too. I'm very satisfied. It's a very happy shopping experience.
Hope	R**3 (anonymous): Overall okay after a day of use, the laptop is pretty good, light and beautiful, which should be genuine. It's the first computer I bought online, hoping it can function properly.
None	G**8 (anonymous): As is expected, the overall effect is good upon a day of use, reaching my expectations. I've never bought any computer online before, and the experience is not bad.
Anger	W**6 (anonymous): After comprehensive comparison, I chose this laptop. It's terrible to use, and looks ugly too. It's my first time to buy a computer online, and I'm very dissatisfied. Feeling extremely angry, would not buy again.
Worry	K**3 (anonymous): After using the laptop for one day, I found it's not running smoothly, with average quality, which should not be genuine. It's the first computer I bought online, and I'm a bit worried about its performance and quality.
None	B**8 (anonymous): Have used some functions, and found that the laptop is not good, which should not be genuine. It's terrible to use, and its appearance differs a little from the picture. It's my first time to buy a computer online, and I'm not very satisfied.

Pan and Zhang [20] determined the valence of a review using review score. In this study, the review valence was determined by review score (the highest score of reviews was 5, and the reviews with a score of 3 were considered neutral; the reviews with a score higher than 3 were considered positive; and those with a score lower than 3 were considered negative). The length of reviews was determined by the word count. Control variables also included the gender, age, education level, occupation, monthly income, online shopping frequency, daily online time, monthly online shopping expenditure, review reading frequency,, purchase experience, etc. of the respondents.

#### 4. Analysis and discussion

##### 4.1. Reliability test

The paper tested the reliability of scales used in the experiment firstly. The scale of perceived usefulness (5 items) was developed based on a study by Sen & Lerman [19],

the measured  $\alpha$  value of perceived usefulness was 0.879. The results showed that the internal consistency validity was high, which conformed to the study requirements.

#### 4.2. Manipulation test

The paper next conducted the manipulation test of the stimulus materials to ensure the independent variables (emotions happiness & hope; angry & worry) were manipulated successfully, they were subjected to manipulation test by the paired sample T test.

For the positive emotions, the results revealed that reviews in the “happiness” condition were more related to happiness than to hope. ( $M_{\text{happiness}} = 5.64$  vs.  $M_{\text{hope}} = 5.07$ ,  $t = 6.868$ ,  $P < 0.001$ ), and reviews in the “hope” condition were more related to hope than to happiness. ( $M_{\text{happiness}}=5.10$  vs.  $M_{\text{hope}}=5.40$ ,  $t= 3.340$ ,  $P < 0.001$ ). For the negative emotions, the results revealed that reviews in the “anger” condition were more related to anger than to worry. ( $M_{\text{anger}}=5.78$  vs.  $M_{\text{worry}}=4.69$ ,  $t= 7.241$ ,  $P < 0.001$ ), and reviews in the “worry” condition were more related to worry than to anger. ( $M_{\text{anger}} = 4.39$  vs.  $M_{\text{worry}} = 6.06$ ,  $t = 14.466$ ,  $P < 0.001$ ). Thus, both the positive and the negative emotions were successfully manipulated.

#### 4.3. Hypothesis test

Our first question concerned about the correlation between positive emotions and perceived usefulness. Comparisons were made on the perceived usefulness levels (happiness) and (hope), respectively.

For the positive emotions, the comparison results were  $M_{\text{happiness}} = 5.1571$  vs  $M_{\text{hope}} = 5.0132$  ( $t = 2.653$ ,  $P < 0.001$ ), showing a marked difference in the mean of perceived usefulness between the happiness and hope groups. Accordingly, reviews containing "happiness" emotion were more useful than those containing "hope" emotion, and reviews of certain positive emotion were more useful than those of uncertain positive emotion. Thus, Hypothesis 1 was fully supported.

**Table 2:** Correlation between positive emotions and perceived usefulness

Emotion	M	t
Happy	5.1571	2.653**
Hope	5.0123	

Note: \*\*represents  $p < 0.01$ , \*\*\*represents  $p < 0.001$

Our second important question concerned about the correlation between negative emotions and perceived usefulness. Comparisons were also made on the perceived usefulness levels (anger) and (worry), respectively.

### Effects of Emotional Certainty on the Perceived Usefulness of Online Reviews

For the negative emotions, the comparison results were  $M_{\text{anger}} = 5.5017$  vs.  $M_{\text{worry}} = 5.4158$  ( $t = 2.026$ ,  $P < 0.05$ ), showing a large difference in the mean of perceived usefulness between the anger and worry groups. Accordingly, reviews containing "anger" emotion were more useful than those containing "worry" emotion, and reviews of certain negative emotion were more useful than those of uncertain negative emotion. Thus, Hypothesis 2 was fully supported.

**Table 3:** Correlation between negative emotions and perceived usefulness

Emotion	M	t
Angry	5.5017	2.026*
Anxiety	5.4158	

note: \*represents  $p < 0.05$

### 5. Discussion and conclusion

The paper discussed the effects of emotional certainty on the perceived usefulness of online reviews for different product types using a scenario simulation. Unlike previous researchers who examined the effects of the single extreme negative emotions [3, 4], it was found emotional certainty had a significant effect on the perceived usefulness of online reviews. Regarding positive emotions, reviews with certain emotion "happiness" are more useful than those with uncertain emotion "hope". This result is identical to that of Ahmad and Laroche [21]. That is, under positive emotions, the higher the degree of emotional certainty, the greater the effect on the perceived usefulness of reviews.

It was also found that negative emotions, emotional certainty affected perceived usefulness of online reviews. the certain negative emotion "anger" is more useful than the uncertain negative emotion "worry", That is, under negative emotions, the higher the degree of emotional certainty, the greater the effect on the perceived usefulness of reviews.

In the research relating to information management, the correlation between emotion and information is often ignored by scholars [22]. In this paper, the important roles played by specific emotions in reviews are explored, and the different effects of emotions in the reviews on readers' perception are verified. Thus, the above conclusions expand the application of emotions in the information management domain to some extent.

Secondly, starting from the emotional certainty, this paper goes deep into the specific review texts, which enriches the research on the review content structure. Previous scholars, such as Pan & Zhang (2011) [20] and Korfiatis, García-Bariocanal & Sánchez-Alonso (2012)[23], explored the effect of online review contents on the perceived usefulness mainly from the aspect of review content quality. Few have studied

Yujie Li

usefulness from the perspective of textual features of review contents, especially from a specific emotional perspective. In this paper, the effects of specific certain and uncertain emotional vocabularies in reviews on the usefulness perception are studied, which finds large differences in the consumers' perception of reviews containing different emotional vocabularies. This study thus enriches the research on the content structure of online reviews.

In terms of management practices, it helps consumers identify useful reviews quickly and efficiently. Potential consumers can judge the reliability of review information swiftly based on the emotions expressed by consumers in different reviews, thereby reducing purchase risk and improving shopping satisfaction. For retailers, by encouraging consumers to express respective certain emotions when writing reviews, their marketing strategies can be improved and the sale of their products can be promoted. As for the e-commerce platforms, they can prompt consumers to post or select post-purchase emotions by setting the emotional options of reviews. The platforms can also determine the usefulness value of the reviews quickly and accurately based on their emotional intensities. Useful reviews are placed at the front of review column to provide some convenience for the consumers in searching for review information.

This study has some limitations and imperfections. The emotional certainty dimension is chosen herein although human emotions are diverse and complex. Inadequacies remain despite the consultation of relevant theories. In future research, the correlation of other emotions with the perceived usefulness of online reviews can be taken into consideration. Additionally, emotional intensity can be divided into more levels for conducting relevant research given the complexity and unboundedness of emotional intensity classification.

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Effects of Emotional Certainty on the Perceived Usefulness of Online Reviews

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Yujie Li

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