

Summer 5-25-2013

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## Recommended Citation

Chen, Jingwen; Wang, Lu; and Zhao, Shan, "A Penny for Your Words: The Effect of Online Review Reward on Information Richness and Sentiment Expression" (2013). *WHICEB 2013 Proceedings*. 27.

<http://aisel.aisnet.org/whiceb2013/27>

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# A Penny for Your Words: The Effect of Online Review Reward on Information Richness and Sentiment Expression

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**Abstract:** Since online customer review has significant impacts on customer's purchase decision and product sales, it has been regarded as a new marketing tool nowadays. Moreover, some online transactional platforms and sellers are trying to encourage customers to provide reviews of high-quality by offering a reward. With the empirical analysis of 1044 samples from a famous C2C e-platform website, results show that reward can significantly improve the information richness of online customer reviews. However, the sentiment customer expressed remains unchanged. More specifically, customers are inclined to provide more information, specially opinionated and positive information. But customers are unlikely to conceal negative information or change their sentiment polarity and intensity.

**Keywords:** online review reward, information richness, sentiment expression, social exchange theory

## 1. INTRODUCTION

Online customer reviews can significantly influence customers' purchase decisions<sup>[1]</sup> since customers more and more depend on online customer reviews to discover quality information when purchasing new products. Moreover, it can not only serve as influencers<sup>[2] [3] [4]</sup> but also predictors of sales<sup>[5]</sup>. Studies show that negative reviews hurt sales and firm net present value<sup>[6] [7]</sup> while more positive reviews can bring more revenue<sup>[8]</sup>. Besides, when the information provided by sellers is not consistent with online reviews, customers are inclined to trust the latter<sup>[9]</sup>. Thus, even strategic manipulation of online customer reviews has been put forward by some firms to influence customers' purchase decisions<sup>[10]</sup>. Online customer reviews have been regarded as a new marketing tool nowadays.

In the online environment, customers cannot experience the product directly than they would in the traditional environment, which greatly increased customers' perceived risks<sup>[4]</sup>. Online customer review is a major source for customers to find quality information for the sake of reducing risks<sup>[11]</sup> and "help customers identify the products that best match their idiosyncratic usage conditions" because it's created by users based on personal usage experience<sup>[12]</sup>. In short, online reviews are of great importance for both firms and customers.

However, studies show that contrary to American customers, Chinese customers always seek for but seldom provide information about the product<sup>[13]</sup>. Reference [2] points out that the lack of quantity and length of review has a negative effect on sales. Moreover, the less information customers provide, the less information their fellow customers can find. In order to solve this problem, some online transactional platforms and sellers attempt to reward customers for providing high-quality reviews. For example, Taobao.com provides a WOM marketing tool for sellers to reward customers for providing high-quality reviews since April 19 in 2012<sup>[14]</sup>.

According to social exchange theory, the more valuable is the result of his action to a person, the more likely he is to perform the action<sup>[15]</sup>. In addition, Homans define reward as "The results of a person's action that have positive values for him"<sup>[15]</sup>. Along with this line, some scholars have found that reward have impacts on customers. For example, rewards can increase referral likelihood<sup>[16]</sup> and has been adopted to develop customer loyalty since it can offer incentives to customers' repetitive purchase<sup>[17]</sup>. However, there is limited research and

almost no empirical work on rewarded review.

This article investigates the impact of reward on information richness and sentiment expression of online reviews customer provided. Across our study, we examine the effect of the presence or absence of a reward on information richness, namely: 1) review length and information volume; 2) opinionated and non-opinionated information. We also examine how reward influences customers' sentiment expression, namely sentiment polarity (i.e., positive or negative polarity) and sentiment intensity (i.e., positive or negative intensity). Our results have implications for exchange theory and for online review reward strategy.

## **2. LITERATURE REVIEW**

### **2.1. Information richness**

Information richness was first introduced to explain how organization “meet the need for information amount and reduce equivocality” since organizations always confront uncertain and ambiguous information [18]. The study further defined richness as the potential information carrying capacity of data [18]. In web environment, customers are unable to contact with products directly because of the separation between information and physical products. Therefore online customers will face greater risks and uncertainty compared to the traditional ones, especially when the information provided by sellers is incomplete or unclear. In marketing, information richness is defined as deep information provided by market, such as product information which can affect customers' purchase behavior [19]-[21]. Studies show that high-level information richness can improve customers' virtual experience [22]. Moreover, the time they spend on searching will be shortened and the time they stay on webpage will be lengthened [21] [22]. However, there are two major differences between the definitions of information richness in this research and in previous researches: First, the information is provided by customers and cannot richen by sellers directly, while in previous studies the information is provided by sellers; Second, the carrier of information in our research is only text while in previous studies includes not only text but also pictures and media. Based on the analysis above, the information richness of review in our study only refers to length and information volume that a review carries.

### **2.2. Sentiment expression**

Studies related to sentiment analysis have enjoyed a huge burst in the area of natural language processing (NLP) in recent years. Sentiment is defined as the affective parts of opinions [23] and sentiment analysis is the task of identifying positive and negative opinions, emotions, and evaluations [24]. Sentiment analysis aims at classifying the contextual polarity of sentiment expressions and determining whether a review is positive or negative [24]-[28]. Researches also find the necessity of measuring the strength of sentiment polarity, in other word, sentiment intensity [23]. Inspired by the method of NLP, we conduct a phrase-level sentiment analysis and classify customers' sentiment expression into two dimensions namely sentiment polarity and sentiment intensity.

### **2.3. Social exchange theory**

We adopt an exchange theory framework for examining consumers' responses to review reward. Social exchange theory believes that any human behavior is subject to some kind of exchange activities which could bring the reward and remuneration. Social relation, which is developed in social exchange, is an exchange relationship [29]. From this perspective, whether reward has an influence on online reviews depends on the tradeoff between customers' perceived costs and perceived benefits of the exchange [30] [31]. The more valuable the reward is, the more likely customers may take action, such as providing more information.

Research on online review identifies several benefits of or motivations for writing reviews on natural conditions. The primary benefits are the potential to enhance their own self-worth by helping others make better choices and reduce post purchase dissonance or anxiety [32]. Writing reviews also involves costs. The most obvious cost is the effort and time spent on writing reviews. We expect that with reward, customers' perceived

benefits and costs will change. The obvious additional benefit is the economic gain from rewarded review. On the cost side, customers may fear that if they provide unrealistic or concealed information of products or services in rewarded review, their fellow customers may suffer and perhaps they will suffer from such reviews in future too. Moreover, according to self-perception theory [33] [34], people try to understand the reason of their own behavior. If a review is rewarded, customers may perceive their behavior is driven by the reward rather than by intrinsic motivations and it's unlikely to be consistent with their own image. It's necessary to know the results beyond what would occur naturally when platforms and sellers try to evaluate the effectiveness of review reward which means the marginal gain from the reward should be large enough to compensate for its cost. Therefore, natural online review is the appropriate comparison in the evaluation of the effects of online rewarded review.

### 3. HYPOTHESIS

In fact, customers are lack of motivations to review after purchase due to the lack of direct interest while they have to cost some time and energy. According to social exchange theory, man's action follows the principle that they act according to the tradeoff between gain and loss. The more value he can gain from his action, the more likely he is to perform [30]. The review reward can be deemed as an additional value offered by sellers for high-quality reviews. Moreover, the offering of a reward from seller and the providing of high-quality review from customers can be thought as an exchange. Thus, we expect that, compared with the non-award situation, award will make consumers more willing to provide reviews of high-quality, such as more information volume and longer length, namely higher information richness. We measure information richness of a review from two aspects, the length and information volume of online reviews. According to the analysis above, we put forward following hypothesis:

H<sub>1a</sub>: The presence of a reward (compared with no reward) increases the length of review.

H<sub>1b</sub>: The presence of a reward (compared with no reward) has a positive effect on information volume of review.

However, not all the sentences in reviews express sentiment. For example, "I bought it for my mother" and "I have not worn yet" are not regarded as opinion or sentiment. So we divide the information of review into two parts: opinionated speeches and non-opinionated speeches. The former refers to those reviews that actually contain opinions about the products or express sentiments toward satisfaction or dissatisfaction; while the latter refers to reviews that contain descriptions about buying experiences or attributes of products without expressing any sentiment. We suppose that with the increase of information richness, the opinionated speeches and non-opinionated speeches will increase accordingly. Thus, we hypothesize the following:

H<sub>2a</sub>: The presence of a reward (compared with no reward) encourages customers to provide more opinionated information.

H<sub>2b</sub>: The presence of a reward (compared with no reward) encourages customers to provide more non-opinionated information.

In the process of exchanging between sellers and customers, we suppose that if the sellers provide more rewards to customers (e.g., voucher, money or gift), customers may try to provide more valuable reviews to sellers (e.g., positive reviews) in return. Therefore, we expect:

H<sub>3a</sub>: The presence of a reward (compared with no reward) encourages customers to provide more positive information.

According to asymmetric information theory, the asymmetry of information, especially the quality information of product, is universal in ordinary commodity market. The sellers have real information of the product but in order to maximize their self-interest, they have motivations to conceal the true information [35].

Along with this logic, when offering a reward, customers have the motivation to conceal negative information for the sake of maximizing their self-interest. Thus:

H<sub>3b</sub>: The presence of a reward (compared with no reward) makes customers to provide less negative information.

The sentiment polarity reflects whether customers are satisfied or dissatisfied, while sentiment intensity refers to the degree of their satisfaction. We suppose that customers will be more satisfied when offered with an unexpected reward. And as a result their sentiment intensity will change. Therefore, we propose the following hypothesis:

H4: The presence of a reward (compared with no reward) makes customers' sentiment intensity enhanced significantly.

H<sub>4a</sub>: The presence of a reward (compared with no reward) makes customers' positive sentiment intensity enhanced significantly.

H<sub>4b</sub>: The presence of a reward (compared with no reward) makes customers' negative sentiment intensity weakened significantly.

## **4. RESEARCH DESIGN**

### **4.1 Sample and data description.**

In order to test these hypotheses, we gathered our data using Java scripts to access and parse HTML and XML pages on reviews from Taobao.com which is the biggest China online transactional electronic business platform. Taobao.com launched a marketing tool called "Serious Review Award" to reward reviews of high quality since April 2012. Sellers can use the tool as they want, but it is Taobao.com who decided whom to reward. Under the above background, one product named winter warm knitted leggings was chosen for the reasons below: it got a fixed price of 19.5 RMB from October 17th, 2012 to December 26th, 2012 and the seller adopted review award on November 20th, 2012. Reviewers who win the review award will get a coupon valued 5RMB. Thus we finally got two group, 604 reviews for experimental group (award) and 440 reviews for control group (non-award).

### **4.2 Annotation Scheme**

For the experiments in this study, we need a review corpus that is annotated comprehensively for sentiment expressions and their contextual polarity. When developing our annotation scheme, there were two questions to address. First, which of the possible sentiment expressions are actually expressing sentiments? Second, what coding scheme should be used for marking contextual polarity? To clarify this question, our annotation scheme has two types of annotations: opinionate speech and non-opinionate speech. Below is an example:

"I bought them for my mother, really thick and super comfy. Good quality except for a little smelly. I bought them for the second time and I'll be back again."

There are six phrases in the sentence (1): the first phrase is annotated as non-opinionate speech, the other phrases is annotated as opinionate speech.

Sentiment intensity captures the contribution of the annotated word or phrase to the overall intensity of the speech. Sentiment intensity in our study ranges from 1 (extremely dissatisfied) to 5 (extremely satisfied). In the sentence above, we annotate "I bought them for my mother" as 6 namely non-opinionated phrases since the reviewer just states the fact without expressing any sentiment or opinion. "Really thick" and "super comfy" get an expression intensity of 5 considering most people think one legging in winter should be the thicker the better. We annotate the last two phrases as 5 because they implicate the repeat purchase behavior and intention which indicates the product is worth buying based on personal usage experience. Furthermore, in order to control the influence of the shopping carnival on Singles day which is the biggest promotion activity launched by

Taobao.com annually, we did not label the sentences that are related to service and delivery.

#### 4.3 Agreement Study

To measure the reliability of polarity and intensity annotation scheme, we conducted an agreement study with two annotators, using 100 reviews from our data. The 100 reviews contain 244 phrases. The result shows that our annotation scheme gets an especially high annotator agreement: we got 223 times agree out of 244, thus inter-rater agreement is 91.39% with a Kappa value of 0.8802. Note that all annotations are included in the experiments.

### 5. ANALYSIS AND RESULT

Table 2 presents the results of descriptive statistic and one-way ANOVA analysis.

**Table 2. Descriptive statistics and One-way ANOVA result**

	Group	N	Mean	Min	Max	SD	SE	F	Sig.
Length	Non-award	440	25.83	4.00	112.00	21.99	1.048	12.094	<b>.001</b>
	Award	604	32.97	4.00	461.00	38.75	1.577		
Information volume <sup>a</sup>	Non-award	440	2.64	4.00	11.00	1.90	0.091	9.807	<b>.002</b>
	Award	604	3.10	0.00	21.00	2.64	0.108		
Opinionated information <sup>b</sup>	Non-award	440	2.10	0.00	8.00	1.33	0.063	10.001	<b>.002</b>
	Award	604	2.41	0.00	10.00	1.73	0.070		
Non-opinionated information <sup>c</sup>	Non-award	440	0.52	0.00	6.00	1.00	0.048	3.429	.064
	Award	604	0.67	0.00	16.00	1.46	0.060		
Positive sentiment polarity <sup>d</sup>	Non-award	440	1.72	0.00	8.00	1.34	0.064	5.850	<b>.016</b>
	Award	604	1.95	0.00	10.00	1.66	0.067		
Negative sentiment polarity <sup>d</sup>	Non-award	440	0.22	0.00	4.00	0.63	0.030	1.483	.224
	Award	604	0.27	0.00	9.00	0.86	0.035		
Sentiment intensity <sup>e</sup>	Non-award	440	4.05	0.00	5.00	1.05	0.050	.003	.954
	Award	604	4.04	0.00	5.00	1.03	0.042		
Positive sentiment intensity	Non-award	440	3.84	0.00	5.00	1.66	0.079	.233	.629
	Award	604	3.89	0.00	5.00	1.61	0.065		
Negative sentiment intensity	Non-award	440	0.26	0.00	2.00	0.66	0.031	1.082	.299
	Award	604	0.31	0.00	2.00	0.70	0.029		

<sup>a</sup> Information Volume refers to any phrases that provide information about products, sentiments and experiences, namely all phrases that are annotated from 1 to 6 according to our annotation scheme.

<sup>b</sup> Opinionated information is the sum of phrases that are annotated from 1 to 5.

<sup>c</sup> Non-opinionated information is the count of phrases that are annotated as 6.

<sup>d</sup> Positive sentiment polarity is the count of phrases that are annotated as 4 and 5 while negative is the count of 1 and 2.

<sup>e</sup> Sentiment intensity is the score of the overall value of one review.

Hypothesis 1 stated that the presence of a reward, compared with no reward, increases the length and information volume of a review. As showed in Table 2, offering a reward has a significant effect on review length ( $p < .01$ ) and information volume ( $p < .01$ ), which implies that customers are more willing to write more and provide more information when offered a reward compared with no reward. More specifically, the reward increased the means of length by more than 7 characters (Non-reward: means=25.83, SD=21.99; Reward: means=32.97, SD=38.75) and information volume by almost 0.5 phrases (Non-reward: means=2.64, SD=1.90;

Reward: means=3.10, SD=2.64). The results suggest that online review reward can be effective in increasing the information richness of review. Hypothesis 1 was supported.

Hypothesis 1 results are consistent with the social exchange theory, but we propose hypothesis 2 to gain greater insights into the composition of the information customers provide. Thus we further examined that if the presence of a reward makes customers provide more opinionated and non-opinionated information. We found significant difference for the providing of opinionated information between the present and the absent of a reward (Non-reward: means=2.10, SD=1.33; Reward: means=2.41, SD=1.73;  $p<.01$ ), but there was no significant difference for the providing of non-opinionated information (Non-reward: means=0.52, SD=1.00; Reward: means=0.67, SD=1.46;  $p>.05$ ).

Hypothesis 1 and 2 suggest that reward matters. What cannot be determined from these hypotheses is whether customers will provide more positive and less negative information. Thus, we proposed hypothesis 3. We found that with a reward, customers are willing to provide more positive information (Non-reward: means=1.72, SD=1.34; Reward: means=1.95, SD=1.66;  $p<.05$ ). However, they are unlikely to conceal negative information ( $p>.22$ ). In addition, we also examined whether there is significant differences on each level of sentiment. Result shows that only extremely dissatisfied presents significant difference between award and non-award (Extremely dissatisfied,  $p>.05$ ; Dissatisfied,  $p>.05$ ; Neutral,  $p>.05$ ; Satisfied,  $p>.05$ ; Extremely satisfied,  $p<.05$ ). We suppose the reason is that customers think they have provided enough positive information (mainly extremely satisfied information) which equals to the value of the reward that seller provided to them. Thus they are lack of motivations to conceal negative information which is caused by unpleasant or unsatisfied sentiment. We suspect that conceal such information or feelings greatly increase customers' psychological costs and thus decrease the value of their actions.

Finally, Hypothesis 4 states that the presence of a reward (compared with no reward) significantly influences customers' overall sentiment intensity, enhances customers' positive sentiment intensity and weakens negative sentiment intensity. However, according to our results, there was no evidence to show that customers' sentiment intensity changes between the two groups (sentiment intensity,  $p>.95$ ; positive sentiment intensity,  $p>.62$ ; negative sentiment intensity,  $p>.05$ ). The possible explanation for this result is that, according to social exchange theory, the balance of the two sides' exchange not only depends on money but also the feelings which are subject to "certain recognized values and institutions of civilization in the past exchange" [15] [34]. Thus, when the conflict between the behavior driven by interest and customers' sentiment needs occurs, it will be hard for most customers to accept because it greatly increases psychological costs.

## 6. CONCLUSIONS AND MANAGARIAL IMPLICATIONS

This study is attempting to investigate whether award has effect on online review information richness and customers' sentiment expression. According to the empirical analysis, we found that when offering online review reward, customers are 1) more willing to write more and provide more information; 2) inclined to provide more opinionated information rather than non-opinionated information; 3) willing to provide more positive and strongly satisfied information but will not conceal negative information; 4) at least with the reward in our research, customers' sentiment polarity and intensity will not change.

Our findings yield several implications for both online platforms and sellers. For platforms, the results suggest that the reward program is effective since it can improve online review's information richness of the whole platform without worrying about review readers get an eyeful of positive information which may lessen their trust. For sellers, online review reward can help sellers to get more reviews of high-quality, more opinionated and positive information. However, if sellers want to get less negative reviews, it seems not so effective just by providing a little extrinsic reward since customers will not conceal negative information.

Except the implications for practice, this article also makes contributions to the literature on exchange theory. First, our finding that rewards increase the information richness of online review and have no significant impact on sentiment expression supports the exchange theory explanation: people do like an equitable or balanced exchange (e.g., customers will provide more positive information for the exchange of reward) but they are unlikely to take action if they felt the exchange is inequitable or unbalanced (e.g., they will not conceal negative information). Furthermore, concealing negative sentiment expression involves high-level of psychological costs which can hardly be influenced by little extrinsic reward.

## 7. LIMITATIONS AND FUTURE RESEARCH

As with any research study, this study has several limitations that should be considered when interpreting the results. The first limitation is that the reward in our research is a coupon valued 5RMB, what is not certain yet is that if customers' sentiment expression will change when the size (smaller, larger) or way of reward (coupons, vouchers or cashback) varied. Second, we concentrated on customers who written the review, but for a reward program to be effective, it must be combined with customer receptivity who read the review. Finally, the roll of personal characteristics and culture differences should be considered in future research.

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