Correction of Online Product Scores from the Perspective of Engagement in the Appraisal Theory

Wang Weijun[1, a], Chen Boyang[2, b]*, Song Yanqiu[3,c]

1(School of Information Management, Central China Normal University, Wuhan 430079, China;

Key Laboratory of Adolescent Cyber psychology and Behavior of Ministry of Education, Central China Normal University, Wuhan, 430079,China)

2(School of Information Management, Central China Normal University, Wuhan 430079, China;

Key Laboratory of Adolescent Cyber psychology and Behavior of Ministry of Education, Central China Normal University, Wuhan, 430079,China)

3(School of Information Management, Central China Normal University, Wuhan 430079, China;

Key Laboratory of Adolescent Cyber psychology and Behavior of Ministry of Education, Central China Normal University, Wuhan, 430079,China)

[a]email: wangwj@mail.ccnu.edu.cn, [b]email:by_chen1991@163.com, [c]email:yanqiusong@yeah,net

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Abstract: Product reviews and scores have a direct impact on consumers' buying behavior. However, there are inconsistency between reviews and scores. Based on the linguistic Appraisal Theory from the perspective of engagement in the theory-construction index system, this article puts forward online product reviews-scores correction method. The method is applied to verify and correct the real product reviews data. The result shows that this method cannot only explain the differences between reviews and scores and reflect the real scores of the products, but also help consumers make better decisions and improve the network evaluation mechanisms.

Introduction

The rapid development of Web technology and electronic commerce has greatly changed people's lives and their way of working. In order to enhance customers' satisfaction and improve their shopping experience, most e-commerce websites encourage consumers to make comments on what they have bought. Therefore, the quantity of online product reviews is also growing rapidly in e-commerce websites with the rapid development of e-commerce. Now the online reviews play a very important role in consumer purchase decisions [1]. However, owing to factors concerning psychology, economy, institutions etcetera, there is a certain gap between review content and review score, which results in score deviation, further make consumers caught in a buying decision dilemma— being vague, contradictory and hesitating.

Relevant Researches

At present, the research of online product reviews has become a very important field. Through making use of computer algorithms or by building the analysis models[2],
the existing researches mainly focus on digging out useful and true reviews to improve review quali

ty and credibility [3-5], reduce the score deviation and lower the perceived risk, thus providing better supports for consumers' decision-making [6,7]. However, the current researches only make text analysis form grammatical or semantic level, discussions and analysis on the pragmatic level is rarely made.

Appraisal Theory and its application in the online product reviews

Theory Introduction

Appraisal Theory is the language resource which is used to express the viewpoint, attitude and standpoint of an author or speaker, consists of three subsystems— Engagement, Attitude and Graduation [8]. Engagement system is the development of conversational linguistics. According to the different characteristics of discourse dialogism, discourses can present different types of engagement, which is called discourse strategies (Figure 1).

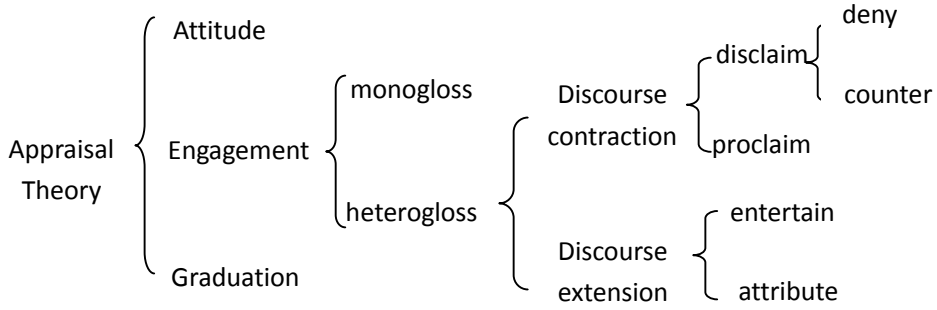

Fig. 1 The Engagement System of Appraisal Theory

Application of Appraisal Theory in the Online Product Reviews

In this chapter, combining with the online product reviews, the paper will introduce the different discourse strategies by choosing five items from Taobao as the objects of study：women's clothing, cosmetics, mobile phones, furniture and books.

(1)Monogloss: ①objective Reviews; ②commentators do not directly comment on the merchandise, but talk about irrelevant stuff; ③comment with short text, reflecting their conclusive standpoint.

(2)Counter: ①the commentator thought that commodity was not good, but get surprised after receiving the commodity, it is beyond their expectation；②contrary to the first one, the commentator thought the commodity was good but only get disappointed after receiving it, they use key words like "but", "actually", "unexpectedly" etcetera.

(3)Deny：This discourse only denies one discourse, either the seller's products or customers who have bought the product.

(4)Entertain: reviews including keywords such as "may", "should", "I feel" to express uncertainty；② use of questions to make doubts about the seller, mostly to express dissatisfaction；③"hope next time...", use euphemism to give sellers some advice, with soft tone.

(5)Attribute: ①referring to the reviews from people around to evaluate goods, such as "xx say…", "it is said that …"; ②commentators themselves do not believe the seller; they try to prove their comments' authenticity and increase the credibility of their reviews by quoting sellers' words.

(6)Proclaim: ①to show their approval, being discriminated by "really", "as expected" and some other keywords; ② to express assertions, such as "absolute", "honestly", "The truth is", "clear", "real" .etc.

Online Product Reviews Scoring System Based on Appraisal Theory

We are aimed at acquiring consumers' cognitive situation concerned with the difference and importance degree among six different discourse strategies. Therefore, we have designed the questionnaire to investigate the situation. 203 people were tested, 132 copies of effective questionnaire were finally retrieved.

Index Weight

Difference refers to the difference before and after the two sentences being added keywords. Importance refers to the keyword's importance. The original comment is the first comment; the comment being removed keywords is the second one. The difference between the two sentences and the importance of the keyword is judged by comparing the two comments.

The degree of difference and importance is graded by five levels, level 1 for small difference, very low degree of importance, level 5 for great difference, very high degree of importance(table 1).

Tab.1 The Difference and Importance of Discourse Strategies

Discourse strategy	**Difference X**			**Importance Y**			**polarity**
	good	middle	bad	good	middle	bad	
Monogloss A	0	0	0	3.55	4.31	4.40	+
Monogloss B	0	0	0	3.12	2.95	3.50	-
Monogloss C	0	0	0	2.81	2.79	3.38	-
Counter A	2.69	2.88	2.88	2.90	2.76	2.76	-
Counter B	2.55	2.48	2.62	2.76	2.36	2.60	-
Deny A	3.24	3.36	3.50	3.31	3.31	3.88	-
Deny B	3.64	3.52	3.29	3.48	3.48	3.00	-
Entertain A	3.24	2.67	2.74	3.00	2.71	2.60	+
Entertain B	4.10	4.21	3.36	4.00	4.05	3.45	-
Entertain C	3.24	2.74	4.02	3.48	3.02	3.79	-
Attribute A	3.33	2.50	3.62	3.40	2.64	3.90	+
Attribute B	3.81	3.98	3.52	3.76	3.86	3.71	-
Proclaim A	2.55	3.10	2.90	2.45	3.19	3.00	+
Proclaim B	3.07	3.10	3.40	3.17	3.33	3.93	+

Revised Method

According to the scores of difference and importance, the weight W_{AT} can be calculated, namely the difference scores X is divided by 5, the importance of the value Y is divided by 5, both for multiplication, get the importance weight W_{AT}:

$$W_{AT} = (X/5) \times (Y/5)$$

Since the situation of monogloss has no difference, so its weight: $W_{AT} = Y / 5$. The correction results are shown in Table 2:

Tab.2 Discourse Strategy Correction Value List

Discourse strategy	good	middle	bad
Monogloss A	4.71	2.14	1.12
Monogloss B	3.38	2.41	1.30
Monogloss C	3.44	2.44	1.32
Counter A	3.69	2.68	1.68
Counter B	3.72	2.77	1.73
Deny A	3.57	2.56	1.46
Deny B	3.49	2.51	1.61
Entertain A	4.39	2.71	1.72
Entertain B	3.34	2.32	1.54
Entertain C	3.55	2.67	1.39
Attribute A	4.45	2.74	1.43
Attribute B	3.43	2.39	1.48
Proclaim A	4.25	2.60	1.65
Proclaim B	4.39	2.59	1.46

Examples illustration

The Case Study

Randomly selected a women's clothing from a taobao seller named "Han du yi she", downloaded all the comments of the goods，totally 111 reviews (Praise 88, Neutral 13, Bad 10). Add all the scores and average it to get the original score of 4.05 points, the correction point is 3.71 points, correction amplitude is 0.34 points. Similarly, the other four commodities are analyzed, and the results are shown in table 3.

Tab.3 Revised Scores of Five Commodities

type	Review num.	Website score	Revised score	score deviation
women's clothing	111	4.05	3.71	0.34
cosmetics	108	4.14	3.72	0.42
books	98	4.27	4.01	0.26
mobile phones	95	4.25	4.09	0.16
furniture	84	4.21	4.02	0.19

Examples Verification

In order to verify the objectivity and effectiveness of the correction result, we comment on the five goods above respectively for manual score, which means to validate analysis of the revised score. SPSS statistical software is used to do the reliability test of the questionnaire, the results are as follows:

Tab.4 Reliability Test of Manual Score

type	Cronbach's Alpha	Review num.
women's clothing	0.958	111
cosmetics	0.810	108
books	0.961	98
mobile phone	0.946	95
furniture	0.831	84

Judging from the table, five questionnaire items Cronbach's Alpha coefficients are above 0.8, indicating that the questionnaire reliability is relatively high. Then, an independent sample T-test of the collected data is made. Differences between manual score and the website scores, correction scores respectively is analyzed through data analysis. The results are summarized in Table 5:

Tab. 5 T-test of Manual Score, Revised Score and Website Score

type	Review Num.	Comparative Item	Independent Samples Test						
			t	df	Sig.(2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
women's clothing	111	t1 - t3	-2.788	220	.006	-.36405	.13057	-.62138	-.10672
		t1 - t2	-.137	220	.892	-.01829	.13392	-.28221	.24564
cosmetics	108	t1 - t3	-3.074	214	.002	-.35303	.11485	-.57941	-.12664
		t1 - t2	.565	214	.572	.06781	.11991	-.16854	.30415
books	98	t1 - t3	-2.777	186.833	.006	-.30654	.11040	-.52433	-.08875
		t1 - t2	-.366	194	.715	-.04491	.12277	-.28704	.19723
mobile phones	95	t1 - t3	-2.032	173.500	.044	-.26112	.12853	-.51480	-.00744
		t1 - t2	-.762	188	.447	-.10701	.14053	-.38422	.17020
furniture	84	t1 - t3	-2.030	154.733	.044	-.28920	.14244	-.57058	-.00782
		t1 - t2	-.587	166	.558	-.09075	.15455	-.39588	.21438

Note: t1- manual score, t2- revised score, t3-website score, t1-t3 T test on the manual score and the website score, t1-t2 T test on the manual score and the revised score.

The significance level P values of manual scores and original website scores are less than 0.05, there is a significant difference; The P values of manual scores and revised scores are greater than 0.05, the difference is not significant. Manual scores are closer to revised scores, which verify the validity and applicability of Appraisal Theory's application to revise the score deviation.

Conclusion

The method is applied to verify and correct the real product reviews data. The result shows that this method cannot only explain the differences between reviews and scores and reflect the real scores of the products, but also help consumers make better decisions and improve the network evaluation mechanisms.

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