Journal of Business Research 62 (2009) 1281–1288

Contents lists available at ScienceDirect

Journal of Business Research

Effects of customer feedback level and (in)consistency on new product acceptance in the click-and-mortar context

Emery Yao [a,*], Ruolian Fang [b], Brian R. Dineen [a], Xin Yao [c]

[a] Gatton College of Business & Economics, University of Kentucky, Lexington, KY 40506, United States
[b] Carlson School of Management, University of Minnesota, Minneapolis, MN 55455, United States
[c] W. Frank Barton School of Business, Wichita State University, Wichita, KS 67260, United States

ARTICLE INFO

Article history:
Received 26 October 2007
Accepted 26 December 2008

Keywords:
Customer feedback
Perceived risk
New product acceptance

ABSTRACT

We propose that feedback level and inconsistency jointly affect potential customers' acceptance of new products. We conducted two studies, one with a two-by-two design in which feedback level and inconsistency were constructed as binary categories, and the other with a continuous design of feedback level and inconsistency. We found that (1) higher feedback level and lower inconsistency increase customer acceptance; (2) feedback inconsistency moderates the relationship between feedback level and customer acceptance; and (3) extremely negative feedback has more significant impact than do moderately negative or extremely positive ones.

1. Introduction

New products may fail to achieve market acceptance because customers find it difficult to accept a product of unknown quality. Scholars have recognized that reputation is an effective means for overcoming such liability of newness (Zimmerman and Zeitz, 2002). Because consumers do not have many sources of information for judging the quality of new products, previous consumer feedback becomes an important signal about product reputation and credibility (Standifird, 2001). Since consumer feedback reflects the history of transactions related to new products and their acceptance or rejection by previous buyers, it greatly shapes market reputation and customer recognition.

Interest is growing in the study of online customer feedback, seller reputation, and sales performance in the click-and-mortar context (Bruce and Lenita, 2005). While such "click-and-mortar" exchanges eliminate the time and space constraints faced by traditional "brick-and-mortar" ones, customers are exposed to higher transaction risk. Standifird (2001) examined consumer feedback to eBay sellers of 3Com Palm Pilots, and found that sellers with positive feedback ratings generated more sales than those with negative ratings. Ba and Pavlou (2002) proposed that sellers with better ratings enjoy greater consumer trust and credibility, and such idea was confirmed by their study on eBay transactions. Melnick and Alm (2002) conducted a similar study on eBay sellers of 1995 U.S. $5 gold coins, and also found a positive relationship between feedback and sales. Taken together, these studies showed that favorable customer feedback can translate into advantageous reputation and affect customer acceptance.

Nevertheless, existing research has not addressed several important questions. First, most studies have focused on feedback level while generally ignoring the role of (in)consistency. These two attributes convey quite distinct characteristics. Feedback level is related to the positivity of customer experience, and (in)consistency reflects the stability. Most products actually receive mixed combinations of level and (in)consistency. For example, on the CNET website, users posted quite divergent feedback regarding Motorola's V3 Razor. More than 800 customers left ratings ranging from 4 to 8 out of 10, with the mean as 6.3. LG's CU500 received a higher mean rating of 7.2, but with a wider range from 1 to 10. Such information about feedback (in)consistency is also evidenced in many other online sites. Studies in marketing have suggested that consistency of reputation is critical to maintain the strength and favorableness of products (Keller, 1998; Swait and Erdem, 2002). Yet, there has been little investigation of feedback (in) consistency, and more importantly how different combinations of feedback level and (in)consistency affect customer acceptance.

Second, although previous studies examined the different effects of positive and negative ratings, they largely ignored *extremely* negative ratings. For example, concerning the LG CU500, one customer left a rating of 1 out of 10 and described it as extremely disappointing. Although the ratings of 4 and 1 are both negative, moderately negative ratings do not convey the same amplitude of customer disappointment as extremely negative ones. It is common to find extremely negative feedback presented simultaneously with moderately negative ones. However, the potential impact of extremely negative feedback is still under-explored.

Third, prior studies have focused on the effect of consumer feedback on established products, and have examined ratings largely on sellers' service (Ba and Pavlou, 2002). Little is still known as to whether these findings can be applied to situations in which consumers make decisions on newly introduced products.

* Corresponding author.
E-mail addresses: emery.yao@uky.edu (E. Yao), fang0106@umn.edu (R. Fang), brian.dineen@uky.edu (B.R. Dineen), xin.yao@wichita.edu (X. Yao).

0148-2963/$ – see front matter © 2009 Elsevier Inc. All rights reserved.
doi:10.1016/j.jbusres.2008.12.008

Drawing on perspectives including perceived risk, social information processing, word of mouth, and online reputation system, we extend this line of research by paying particular attention to these important factors largely ignored in previous studies. We propose that both *level* and *(in)consistency* of previous feedback influence customer acceptance. Feedback (in)consistency should not only have a strong main effect, but should also moderate the relationship between feedback level and purchase decisions. We further argue that *extremely negative feedback* will have a much stronger impact than *moderately negative feedback*. In addition, we propose the impact of extremely negative ratings is greater than that of extremely positive ones.

We conducted two separate studies to investigate the effects of customer feedback. In the first study, we adopted a two-by-two experimental design, in which feedback level and consistency were constructed as binary categories. The second study was designed to provide a more randomized and continuous distribution. Our propositions are largely supported in these two distinct studies.

In the following sections, we first discuss how new product reputation and market success are related to customer feedback. Then we develop hypotheses about feedback attributes of level and inconsistency, with particular attention to the effect of extremely negative ratings. Last, we explain our research design, analyze our results, and conclude with contributions and limitations of our study.

2. Theoretical background and hypotheses

2.1. New product introduction and customer acceptance

Stinchcombe (1965) used the phrase "liability of newness" to explain that new organizations are particularly prone to failure, and this was supported in various studies (e.g., Freeman et al., 1983). Recently, scholars have applied this perspective to the performance of new products and technologies (Schoonhoven et al., 1990). Researchers have recognized the importance of reputation for new venture and product success, regarding reputation as an effective means of overcoming such liability (Zimmerman and Zeitz, 2002).

Weigelt and Camerer (1988) proposed that reputation is based on past transactions, and people use past observations and history as signals to form beliefs and perceptions. Previous consumer feedback greatly shapes market reputation and affects potential consumers' purchase decisions. Our study extends this line of research to newly introduced products and examines their market acceptance.

2.2. Consumer decision making in the click-and-mortar context

As illustrated in Fig. 1, a classic buyer decision-making process consists of five cognitive stages: problem recognition, information search, alternative evaluation, purchase decision, and post-purchase behavior.

Problem recognition occurs when consumers sense a disparity between their actual state and desired state, usually activated by external stimuli (Bruner, 1987). Consumers are motivated to gather information to satisfy the unmet need, identifying a set of alternative products (Howard and Sheth, 1969). Then consumers may use several comparisons to evaluate alternative products. After that, consumers typically form a product preference and decide on the most desirable product. However, consumer behavior does not stop there. Customers experience certain levels of satisfaction or dissatisfaction and tend to express their opinions to others (Taylor, 1991).

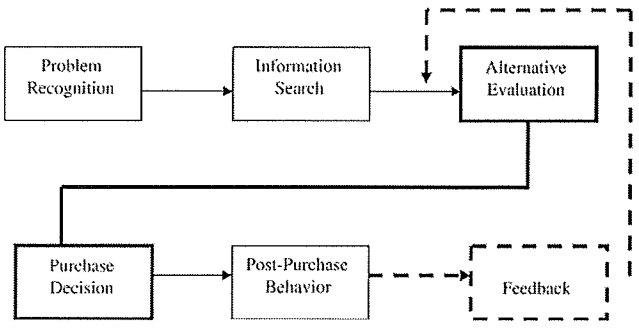

Fig. 1. Consumer decision-making in the click-and-mortar context.

There are several literature streams that support the critical role of previous feedback in shaping customer perceptions of unfamiliar products. In this section, we briefly review and summarize their relationships with our logic pertaining to feedback ratings.

2.2.1. Perceived risk theory

Perceived risk is defined as a consumer's perception of the uncertainty and adverse consequences of buying a product (Dowing and Staelin, 1994). Perceived risk theory has been used to study various aspects of consumer behavior related to newness; for example, the purchase of a new product (Popielarz, 1967), the diffusion of new product information (Cunningham, 1967), and the selection of a new dentist (Coleman et al., 1995). Most studies from this stream confirm that people tend to engage in activities that will improve their perceived trust, such as collecting third-party opinions. In addition, when facing alternative choices, people tend to avoid those that increase perceived risk.

2.2.2. Social information processing theory

Social information processing theory (Salancik and Preffer, 1978) proposes that when people feel uncertain in making judgments, they rely more on others' opinions (Higgins, 2001). Rynes et al. (1991) suggested that people tend to base their perceptions about unfamiliar organizations on information from others who have already had direct experience. Previous customers' feedback provides valuable information such as whether they were satisfied with their purchases and whether the product quality is trustworthy. Thus, customer feedback is among the critical "social information" that potential customers can rely on to reduce uncertainty and assist in making decisions.

2.2.3. Word-of-mouth communication

Studies have discussed informal situations where people casually interact in a word-of-mouth context to share their interests and opinions (Collins and Stevens, 2002). This literature has suggested a significant influence of word-of-mouth on consumer decision making, and such influence is usually stronger than that of formal marketing communication (Bone, 1995). Recently, scholars have turned to the issue of word-of-mouth communication over the Internet. Stauss (2000) defines Internet word-of-mouth communication as occurring when customers express and exchange their opinions over the Internet, and groups such online articulations under the general concept of word-of-mouth communication. We also believe informal interactions over the Internet greatly affect potential customers' information gathering and decision making.

2.2.4. Online feedback and reputation system

According to Weinberg and Davis (2005), online transaction feedback systems provide a type of word-of-web that transaction participants use to exchange information and opinions to reduce uncertainty. Scholars believe that a critical reason for the success of online auction sites is the use of online feedback as a reputation system to help sustain trust in online markets (Shankar et al., 2002; Wang and Emurian, 2005). Most studies have focused on the mechanism of online feedback systems such as eBay, and have examined how sellers' reputations gained from feedback can improve their future sales. Their findings generally supported that sellers' feedback profiles can influence buyers' behavior and future sales (Lee and Malmendier, 2005).

Taken together, these research streams support a general theme that, in a click-and-mortar environment, people tend to rely heavily on previous customer feedback, and feedback attributes are among the key factors impacting customers' decisions. We believe that a thorough

examination of the combined effects of feedback level and (in) consistency will cast more insight into the study of consumer decision making in the click-and-mortar context.

2.3. Effects of previous customer feedback

2.3.1. Effect of feedback level

Numerous studies have supported the idea that perceived risk or reliability plays a major role in generating market acceptance when a firm's actual product quality is unknown (Melnick and Alm, 2002). In such situations, people tend to collect others' opinions about unfamiliar products. Thus, favorable customer feedback greatly reduces perceived risk. Specifically, Podolny (1993) proposed that positive third-party opinions can signal the underlying quality of products: "If an actor is uncertain of the actual quality of the goods that confront her in the market ...then the regard that other market participants have for a given producer is a fairly strong indicator of the quality of the producer's output" (p. 831).

Higher feedback levels indicate that previous customers have positive impressions of products; this will in turn give producers strategic advantages over competitors in terms of selling similar products (Barney and Hansen, 1994). When people treat customer feedback as a signal of unobserved quality, they will be more reluctant to purchase products with less favorable feedback, even if all products are claimed to possess the same quality and the same price (Eastlick and Feinberg, 1999). In a similar vein, during click-and-mortar transactions, products with higher feedback levels should be more likely to gain market acceptance.

Hypothesis 1. Other conditions being equal, potential customers will be more likely to purchase products with higher feedback levels than with lower feedback levels.

2.3.2. Effect of feedback (in)consistency

Feedback with higher inconsistency signals perceived instability of product reputation. Contradictory and widely dispersed opinions may leave consumers with an unclear picture and reduce their perceptions as to product credibility (Kahneman and Tversky, 1979). In other words, higher inconsistency of feedback ratings increases perceived risk.

Such a view is supported in studies on the inconsistency of firms' marketing behavior such as price promoting. For example, scholars have suggested that high variability in marketing practice will negatively affect brand evaluations and erode product reputation (Erdem and Swait, 1998). Although previous studies have mainly focused on the inconsistency of firms' own marketing behavior (Swait and Erdem, 2002), the underlying logic also supports the idea that such reputation inconsistency will negatively affect customer acceptance. In the context of customer feedback systems, we propose that feedback consistency will help improve perceived product reputation and quality. For products with similar feedback levels, a product with lower inconsistency is more likely to gain market acceptance.

Hypothesis 2. Other conditions being equal, potential customers will be more likely to purchase products with lower rating inconsistency than with higher rating inconsistency.

2.3.3. Joint effect of feedback level and (in)consistency

It is suggested that consumer choices are highly contingent on a variety of factors characterizing options. The perceived value of an option depends not only on characteristics of that option but also on characteristics of other options (Cox and Rank, 1992). The combination of a favorable level (or consistency) and unfavorable consistency (or level) represents important contingency factors.

When potential purchasers review previous feedback, they may face a tradeoff between one product with a favorable level but unfavorable consistency (e.g., slightly higher level and higher inconsistency) and another product with a favorable consistency but unfavorable level (e.g., slightly lower inconsistency and lower level). Although both level and inconsistency affect perceived risk, their underlying implications to consumers are quite different. Higher level of ratings implies that most previous customers are satisfied with the product. Lower inconsistency of ratings suggests that most previous customers agree on evaluations of the product. As we hypothesized, potential customers prefer products with higher rating levels. However, such preferences may be mitigated by rating inconsistency. Under the condition of lower inconsistency, customers' preferences for products with higher feedback levels will be strengthened because lower inconsistency reflects product reliability. By contrast, under the condition of higher inconsistency, such preferences are likely weakened.

Hypothesis 3. Rating inconsistency will moderate the positive relationship between rating level and potential customers' purchase decisions, such that the relationship will be stronger for products with lower rating inconsistency.

2.3.4. Effect of extremely negative ratings

Consumers collect information to reduce perceived risk, and purchase decisions are made more often to avoid mistakes than to maximize gains (Mitchell and McGoldrick, 1996). It is common to find that extremely negative ratings and moderately negative ratings are presented simultaneously in customer feedback. Prospect theory describes the decision process by which people compare options and indicates that losses loom larger than gains in their minds.

Compared with moderately negative ratings, extremely negative ratings convey a much stronger signal about undesirability or unreliability of product quality and reputation. Given customers' preference to avoid loss and reduce risk, extremely negative ratings will affect customer purchase decisions much more strongly than moderately negative ratings. Thus, we hypothesize:

Hypothesis 4a. Other conditions being equal, extremely negative ratings will have a much greater negative impact on potential customers' purchase decisions than will moderately negative ratings.

Furthermore, it is particularly intriguing to examine how the simultaneous presence of both positive and negative extremes would influence potential customers' purchase decisions. According to the negative asymmetry argument, people tend to focus more heavily on negative stimuli as a threat than on positive stimuli as a benefit (Standifird, 2001). Many examples also justify the observation that individuals place greater weight on losses than on wins (Bazerman, 1984; Kahneman and Tversky, 1979). For example, Russo et al. (1989) found little effect from listing positive nutrients contained in a product such as vitamins, but found strong and negative effects from listing negative nutrients. As such, when a product receives both extremely positive and extremely negative ratings, the negative ratings are likely to overshadow the positive ones.

Hypothesis 4b. Other conditions being equal, extremely negative ratings will have a greater impact on potential customers' purchase decisions than will extremely positive ratings.

3. Research method

We designed two separate studies to test our hypotheses. In our first study we adopted a two-by-two design in which feedback level and (in)consistency were constructed as binary categories, as outlined in Table 1. Study 1 was highly controlled to isolate the effects of rating level and rating inconsistency as well as their interaction. In Study 2, we incorporated a continuous distribution of both feedback level and (in)consistency, based on random feedback profiles.

Table 1
A two-by-two contingency table of feedback level and inconsistency.

(Type 1) Higher feedback level with lower inconsistency	*(Type 2)* Higher feedback level with higher inconsistency
(Type 3) Lower feedback level with lower inconsistency	*(Type 4)* Lower feedback level with higher inconsistency

3.1. Study 1

3.1.1. Sample

Participating in the study were 396 undergraduate students who produced 375 usable questionnaires. These respondents averaged 22 years of age (SD = 3.13); 53% were male.

3.1.2. Procedure

We tested our hypotheses with a scenario-based questionnaire. Participants were given the following instructions:

> Suppose you are going to buy a digital camera online. There are two new digital camera products (Brand A and B) in the market. They are similar in price, model, and functions. Both brands were recently released with unknown market acceptance. But you can find previous consumers' feedback for these two brands on an independent third-party website.

Participants were then presented with two tables that contained previous customers' comments and corresponding ratings for the products. That is, each brand had comment and rating combinations from 15 previous customers (see Appendix A). The following scale was used for the customer ratings:

> 1 = Very undesirable. A product that receives this rating scores lower on all of its rating criteria. It does not satisfy any of its intended users' needs and has no meaningful strengths.
> 2 = Undesirable. A product that receives this rating is below average. It falls in the middle of the pack for most features, but suffers from a few additional major flaws.
> 3 = Average. A product that receives this rating is at its average. Its strengths may slightly outweigh its weaknesses, making it good for most uses but not a standout.
> 4 = Good. A product that receives this rating is superior in so many ways that its relatively few drawbacks are not very important.
> 5 = Excellent. A product that receives this rating is as perfect as it could be. The product scores higher on all of its rating criteria and succeeds at meeting all of its intended users' needs and has no meaningful drawbacks.

We first examined specific websites such as CNET for expert reviews on industry standards and technology criteria related to digital cameras. We also extracted actual consumer comments and constructed the four combinations of level and (in)consistency (see Appendix A for a sample comment-rating combination).

After reading the feedback, participants were asked to indicate the likelihood that they would purchase the product. Each respondent made two separate purchase decisions (for Brand A and Brand B). Therefore, 750 (375 × 2) purchase decision responses were collected. Questions about participants' risk tolerance, demographics, and online shopping experience were included at the end of the questionnaire.

3.1.3. Measures

3.1.3.1. Purchase decision. The measure of this variable was based on the questions: "How likely will you choose Brand A?" and "How likely will you choose Brand B?" respectively. We provided five response options ranging from 1 (*Very Unlikely*) to 5 (*Very Likely*).

3.1.3.2. Feedback level. Levels were coded into 0–1 binary categories in which 0 represents lower rating level and 1 represents higher rating level.

3.1.3.3. Feedback inconsistency. Inconsistency was measured as the variance of the feedback ratings. Thus, high rating variance indicates high rating inconsistency. Similarly, the inconsistency was coded into 0–1 binary categories in which 0 represents lower rating inconsistency and 1 represents higher rating inconsistency.

3.1.3.4. Negative and positive feedback. We treated comments with a rating of 1 (*Very Undesirable*) as extremely negative ratings, and ones with a rating of 2 (*Undesirable*) as moderately negative. Correspondingly, we coded comments with a rating of 5 (*Excellent*) as extremely positive ones.

3.1.3.5. Controls. Studies have shown that online shopping experience and risk tolerance influence purchases (Bhatnagar et al., 2000). We included these two variables to control confounding effects. Online shopping experience was measured with the question "Do you think that you have a lot of experience with online shopping?" Risk tolerance was measured with the question "Do you think that you are the type of person who always avoids risk and uncertainty?" Both questions had five response options from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*). Buyers' age and gender were also controlled because they have been found to influence online shopping (Kumar et al., 2004). Age was measured in years. Gender was coded 0 for men and 1 for women.

3.1.4. Results in Study 1

Table 2 shows the descriptive statistics for the study variables. Purchase decision was positively related to rating level ($r = .28$, $p < .001$) but negatively related to rating inconsistency ($r = -.27$, $p < .001$). However, purchase decision did not correlate with any of the four controls – age, gender, risk tolerance, and online shopping experience.

We conducted univariate analysis of covariance (ANCOVA) to examine the impact of feedback level and inconsistency. The results in Table 3 showed that the four controls did not have significant effects on purchase decisions ($F = .06$ for gender; $F = 2.13$ for age; $F = .43$ for online shopping experience; and $F = 2.16$ for risk tolerance; all n.s.). Therefore, we excluded the controls in the following level comparison tests for purchase decisions. The results showed that the rating level and inconsistency had significant main and interactive effects on purchase decisions ($F = 77.28$, $p < .001$ for level; $F = 63.88$, $p < .01$ for inconsistency; $F = 11.89$, $p < .001$ for the interaction). We conducted a series of t-tests on level comparison for purchase decisions and outlined the results in Table 4.

3.1.4.1. Effect of feedback level. The t-test in Table 4 revealed that the likelihood of purchasing products with higher feedback level was significantly larger than that of lower level ($t = 8.01$, $p < .001$). Therefore, Hypothesis 1 was fully supported.

3.1.4.2. Effect of feedback (in)consistency. The results in Table 4 showed that the likelihood of purchasing products with lower feedback inconsistency was also significantly larger than that of higher inconsistency ($t = 7.74$, $p < .001$). Therefore, Hypothesis 2 was supported.

3.1.4.3. Joint effect of feedback level and inconsistency. Hypothesis 3 predicted that inconsistency will moderate the positive effect of rating

Table 2
Descriptive statistics and correlations (Study 1).

Variable	*M*	SD	1	2	3	4	5	6
1. Purchase decision	3.22	1.14						
2. Feedback level	.50	.50	.28***					
3. Feedback inconsistency	.52	.50	.27***	.02				
4. Gender	.47	.50	.01	−.01	−.04			
5. Age	21.86	3.13	−.04	.04	.05	−.06		
6. Online shopping experience	3.65	1.84	.01	−.02	.02	−.09*	.14**	
7. Risk tolerance	2.89	1.01	.05	−.02	−.05	.17**	.01	−.03

* $p < .05$, ** $p < .01$, *** $p < .001$.

Table 3
Analysis of covariance for purchase decisions (Study 1).

Source	Type III sum of squares	*df*	Mean square	*F*
Corrected model	167.22	7	23.89	21.86***
Intercept	145.30	1	145.30	132.99***
Gender	.06	1	.06	.06
Age	2.33	1	2.33	2.13
Online shopping experience	.47	1	.47	.43
Risk tolerance	2.36	1	2.36	2.16
Feedback level	84.44	1	84.44	77.28***
Feedback inconsistency	69.80	1	69.80	63.88**
Feedback level* inconsistency	12.99	1	12.99	11.89***
Error	793.24	726	1.09	
Total	8600.00	734		
Corrected total	960.46	733		

$R^2 = .17$ (adjusted $R^2 = .17$); *$p<.05$, **$p<.01$, ***$p<.001$.

level on purchase decisions. Table 3 showed a significant interaction between level and inconsistency ($F = 11.89$, $p<.001$). The interaction plot in Fig. 2 also indicated such moderation effect. Therefore, Hypothesis 3 was fully supported.

3.1.4.4. Effect of extremely negative feedback. The *t*-test result in Table 4 shows that the negative effect of extremely negative ratings was greater than that of moderately negative ratings ($t = -2.24$, $p<.05$). Therefore, Hypothesis 4a was supported. Hypothesis 4b involved the comparison between positive and negative extremities of ratings. The *t*-test result in Table 4 showed that the impact of extremely negative ratings was much stronger than that of extremely positive ratings ($t = -8.88$, $p<.001$). Thus, Hypothesis 4b was supported.

3.2. Study 2

In Study 2, we used a distinct design that generated continuous observations on feedback level and (in)consistency. In addition, to increase the range and random distribution of these two variables, we used a feedback rating scale ranging from 1 (poor) to 7 (excellent).

3.2.1. Sample

Participants in this study were a different group of undergraduate students who produced 170 usable questionnaires. These respondents averaged 22 years of age (SD = 2.19); 47% were male. Their ethnic backgrounds were Caucasian (90%), Hispanic/Latino (3%), Black/African-American (5%), and Asian/Asian American (2%).

3.2.2. Procedure

After reading the feedback, participants were asked to indicate the likelihood of purchase. Similar to Study 1, each respondent made two separate purchase decisions regarding Brand A and Brand B. A total of 340 purchase decision responses were collected. Questions related to

Table 4
t-tests for purchase decisions (Study 1).

Hypothesis	Mean comparison	Mean difference	*df*	*t*-value
Hypothesis 1 supported	(Type 1 and Type 2)> (Type 3 and Type 4)	.64	748	8.01***
Hypothesis 2 supported	(Type 1 and Type 3)> (Type 2 and Type 4)	.62	748	7.74***
Hypothesis 4a supported	The negative effect of extremely negative ratings is much greater than that of moderately negative ratings.	−.29	321	−2.24*
Hypothesis 4b supported	The effect of extremely negative ratings is much greater than that of extremely positive ones.	−.89	370	−8.88***

*$p<.05$; ***$p<.001$.

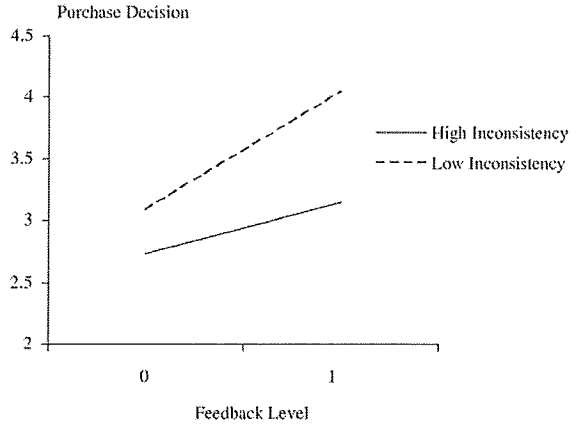

Fig. 2. Interaction between feedback level and inconsistency (Study 1).

participants' demographics, risk tolerance, and different aspects of online shopping were also included at the end of the questionnaire.

3.2.3. Measures

3.2.3.1. Purchase decision. Similar to Study 1, the dependent variable in this study is the purchase decision regarding the new online product. The measure of this variable was based on the question: "How likely will you choose Brand A?" and "How likely will you choose Brand B?" respectively.

3.2.3.2. Feedback level. We gave participants random distributions of customer ratings, compared with the four fixed combinations in Study 1. In addition, participants were not given a fixed set of 15 rating comments in each feedback, but a random number of comments.

3.2.3.3. Feedback inconsistency. We also treated the feedback inconsistency as a continuous variable. This variable was again calculated as the variance of rating level.

3.2.3.4. Controls. We included additional controls related to different aspects of online shopping behavior in Study 2, such as online shopping experience, frequency, recency of last purchase, tendency to review previous customer feedback, and yearly family expenditure through online shopping, to eliminate confounding effects on purchase decisions. These variables were measured with the following questions, respectively: (1) "How long have you been shopping online?" (2) "How often do you buy something online?" (3) "When did you make your last online purchase?" (4) "To what extent do you read other customers' feedback when you purchase online items from websites such as eBay?" and (5) "How much did your family spend on online purchases in the last year?" We also included the number of ratings as a control, as participants were provided a random number of customer feedback than a fixed number of 15.

3.2.4. Results in Study 2

Table 5 shows the descriptive statistics for the study variables. Purchase decisions were positively related to feedback level ($r = .44$, $p<.001$) but negatively related to inconsistency ($r = -.21$, $p<.001$). However, purchase decisions did not correlate with the controls — gender, age, race, online shopping experience, online shopping frequency, online shopping recency, tendency to review previous feedback, yearly family online expenditure, risk tolerance, and number of ratings. In addition, the correlation between feedback level and inconsistency was not significant.

3.2.4.1. Effect of feedback level. The results in Table 6 showed that rating level had a significant positive impact on purchase decisions in both Model 2 ($b = .41$, $p<.001$) and Model 4 ($b = .40$, $p<.001$). Therefore, Hypothesis 1 was fully supported.

Table 5
Descriptive statistics and correlations (Study 2).

	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12
1. Purchase decision	3.39	1.11												
2. Feedback level	4.01	1.16	.44**											
3. Feedback inconsistency	2.13	1.57	−.21**	−.02										
4. Gender	.37	.49	−.03	−.04	−.11									
5. Age	22.32	2.19	.02	.08	.07	−.17*								
6. Race	.91	.28	−.00	−.04	.03	−.15	−.09							
7. Online shopping experience	4.94	1.92	.08	.13	−.07	−.17*	.13	.00						
8. Online shopping frequency	3.25	.79	.09	.10	−.09	−.03	−.10	.07	.31**					
9. Online shopping recency	1.45	.89	−.01	−.03	.07	.08	−.03	−.08	−.21**	−.41**				
10. Tendency to review feedback	3.38	1.06	.02	−.02	.01	−.07	.10	−.01	.05	.23**	−.37**			
11. Yearly online expenditure	3.81	.91	.02	.19*	−.12	−.19*	.03	.07	.31**	.14	−.19*	.02		
12. Risk tolerance	2.71	.89	.10	.05	.03	.21**	−.08	.06	.07	−.01	.12	.01	−.01	
13. Number of ratings	8.52	2.10	.13	.21**	.08	.11	.09	−.16*	−.07	−.05	.04	.05	.03	−.02

*$p<.05$; **$p<.01$.

3.2.4.2. Effect of feedback (in)consistency. We also found that feedback inconsistency had a significant negative impact on purchase decisions in Model 3 ($b=-.16$, $p<.01$) and Model 4 ($b=-.15$, $p<.01$). Therefore, Hypothesis 2 was fully supported.

3.2.4.3. Joint effect of feedback level and (in)consistency. The result in Model 5 showed that the first-order interaction was not significant ($b=-.01$, n.s.). Nevertheless, we detected significant and interesting findings when we added the second-order interaction in Model 6. Customer perceived risk is expected to be higher when average rating level is low. In such cases, customers tend to be more averse and rating inconsistency plays an even more important role in affecting perceived risk. In fact, our findings from Study 1 also implied that such feedback level has a non-linear association with customer purchase decisions. Hypotheses 4a and 4b suggested that when customer feedback level moves from positive to moderately negative and extremely negative, the magnitude of its influence tends to exhibit a non-linear increase. This is in line with the present inverted-U shape.

4. Discussion

Previous customer feedback plays an important role in providing users' experiences and opinions. In fact, many people credit eBay's success to its well developed online feedback system where potential customers can read others' past transaction experiences (Grant, 2002; Weinberg and Davis, 2005). Departing from most previous studies, this paper attempts to advance our understandings on the joint effects of various feedback attributes on consumer acceptance of new products. Instead of grouping all negative ratings into the same category, we further distinguished between extremely negative and moderately negative ones, and showed the former has more significant impact. In addition, we confirmed the negative asymmetry effect in that the influence of negative feedback was found much stronger than positive ones (Standifird, 2001).

Table 6
Multiple regression results for purchase decisions (Study 2).

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Controls						
Gender	−.13	−.10	−.21	−.17	−.17	−.17
Age	.01	−.01	.01	.00	−.00	−.00
Race	.01	.05	.04	.09	.09	.06
Online shopping experience	.03	.02	.03	.01	−.01	−.01
Online shopping frequency	.13	.07	.11	.05	.05	.05
Online shopping recency	.03	.02	.04	.02	.02	−.00
Tendency to review online feedback	−.01	.02	−.01	.02	.02	.01
Yearly online expenditure	−.02	−.10	−.06	−.14	−.14	−.13
Risk tolerance	.13	.10	.15	.12	.12	.15
Number of ratings	.08*	.03	.09	.04	.04	.04
Independent variables						
Feedback level		.42***		.42***	.41***	.35***
Feedback inconsistency			−.17**	−.16**	−.16**	−.15**
Interactions						
Feedback level × inconsistency					−.01	−.03
Feedback level^2						−.22*
Feedback level^2 × inconsistency						−.11*
Total R^2	.04	.21***	.10**	.27***	.27***	.29***

*$p<.05$; **$p<.01$; all variables are standardized.

Overall, the current results illustrate how feedback level and inconsistency affect purchase decisions in the click-and-mortar context. Our findings have three implications. First, although this study tested reactions to a physical product, our hypotheses can be extended to cover purchase decisions regarding other new products or services (e.g., customer feedback regarding hotel quality found on Expedia.com). Second, our findings inform companies about how potential customers use previous feedback to aid decision making. Companies may derive better insight into how best to manage reputation and marketing efforts in the digital age. Third, this paper provides additional insight on the design of online transaction and feedback systems. As Kambil and van Heck (2002) suggested, an ideal transaction site such as eBay will not only attract more potential customers who are looking for products, but also attract more sellers to get involved. In fact, eBay has attracted famous companies such as Apple and Dell to accelerate their new product introduction.

Like previous studies on rating evaluation (Wong and Kwong, 2005), our studies isolated other factors that occur in real-world settings. Because we were particularly interested in new product acceptance, we focused our analysis on the product level rather than the firm level. In our research design, we examined product reputation rather than firm reputation. Our choice of research design increased the overall internal validity of the research, which is particularly important in understanding feedback evaluation (DeNisi, 1996). This approach is also consistent with many studies on the eBay system, in which sellers are anonymous and potential customers generate their own perception about the sellers and products via a feedback system.

Our approach of experimental design also carries some limitations. The lack of information on the camera manufacturers may make it difficult to predict customer behavior in a more complex context. Future studies should further expand the scope of factors that can affect customers' purchase decisions. By simultaneously investigating the impact of different sources of information (e.g., TV commercials, newspaper advertisements, billboards, and online advertisements), we might better understand the constructive nature of consumer choice (Bettman et al., 1998). In addition, our participant group comprised undergraduate students. Although we are confident that those participants are active online consumers by verifying their online shopping experience, frequency, and recency, we acknowledge that our findings may not be readily generalized to the whole population.

Acknowledgments

We thank Lei-Yu Wu and two anonymous reviewers for helpful comments on earlier versions of this article.

Appendix A. Sample comment-rating combination in Study 1

Very Undesirable	Undesirable	Average	Good	Excellent				
1	2	3	4	5				
Brand A[a]				1	2	3	4	5
1. Image quality is very good, but not as good as I expected.						√		
2. I am new to the digital camera world and like this camera a lot.							√	
3. Great camera for the money.							√	
4. Feature for feature, this camera is average among its similar series.						√		
5. Excellent allrounder for beginners and intermediate levels.							√	
6. This camera does live up to its pedigree.							√	
7. Very fast reaction.							√	
8. The picture quality is amazing. The clips are beautiful.								√
9. It is a good camera.							√	
10. Its strengths certainly outweigh its weaknesses.							√	
11. This camera is worth every penny.								√
12. I must say that this camera is not only a great product, but a lot of fun too.							√	
13. It's got everything that a not-yet-professional-but-getting-close user might want.							√	
14. Solid enough for a professional.							√	
15. Though not perfect, I am satisfied.							√	
Brand B[b]				1	2	3	4	5
1. Extreme noise before picture.				√				
2. Good body design, but lens just so-so.						√		
3. Pretty good but not pro quality.							√	
4. Feature for feature, this camera is average among its similar series.						√		
5. Really good auto focus, solid lens, just hope the price would drop a bit.							√	
6. Image quality is pretty good, but not as good as I expected.						√		
7. Its features are only average but it has a few additional major flaws.					√			
8. This camera is not perfect, but is a good buy for the price I paid.							√	
9. It has loads of practical features with ease of use, only few flaws.							√	
10. Simply functions for a point and shoot guy like me.						√		
11. Just one works for me, not super good nor super bad choice.						√		
12. This camera is not the best, but does live up to my expectation.						√		
13. Good image quality, but too complicated to operate.						√		
14. Slightly better than previous version but with many flaws.					√			
15. Perfect image quality, but a bit too complicated to operate.								√

[a] Example of feedback with high mean level and low inconsistency.
[b] Example of feedback with low mean level and high inconsistency.

References

Ba S, Pavlou P. Evidence of the effect of trust in electronic markets: price premiums and buyer behavior. MIS Q 2002;23:243–68.
Barney JB, Hansen MH. Trustworthiness as a source of competitive advantage. Strateg Manage J 1994;15:175–90.
Bazerman MH. Escalation of commitment in individual and group decision-making. Organ Behav Hum Perform 1984;33:141–52.
Bettman J, Luce M, Payne J. Constructive consumer choice processes. J Consum Res 1998;25:187–217.
Bhatnagar A, Misra S, Rao H. On risk, convenience, and Internet shopping behavior. Commun ACM 2000;43:98–105.
Bone PF. Word of mouth effects on short-term and long-term product judgments. J Bus Res 1995;32(3):213–23.
Bruce W, Lenita D. Exploring the WOW in online auction feedback. J Bus Res 2005;58: 1609–21.
Bruner J. Life as narrative. Soc Res 1987;54:11–32.
Coleman W, Warren W, Huston R. Perceived risk and the information search process in the selection of a new dentist: an empirical investigation. Health Market Q 1995;13: 27–41.
Collins CJ, Stevens CK. The relationship between early recruitment-related activities and the application decisions of new labor–market entrants: a brand-equity approach to recruitment. J Appl Psychol 2002;87:1121–33.
Cox D, Rank M. Inter-vivos transfers and intergenerational exchange. Rev Econ Stat 1992;74:305–14.
Cunningham S. The major dimensions of perceived risk. In: Cox Donald, editor. Risk-taking and information handling in consumer behavior. Boston: Harvard University Press; 1967.
DeNisi A. Special research forum: human resource management and organizational performance. Acad Manage J 1996;39:777.
Dowing GR, Staelin R. A model of perceived risk and intended risk-handling activity. J Consum Res 1994;21:119–34.
Eastlick M, Feinberg R. Shopping motives for mail catalog shopping. J Bus Res 1999;45: 281–90.
Erdem T, Swait J. Brand equity as a signaling phenomenon. J Consum Psychol 1998;7(2): 131–57.
Freeman J, Carroll G, Hannan M. The liability of newness: age dependence in organizational death rates. Am Sociol Rev 1983;48:692–710.
Grant EX. What makes eBay invincible. E-commerce times; 2002.
Higgins ET. Promotion and prevention experiences: relating emotions to non-emotional motivational states. In: Forgas JP, editor. The handbook of affect and social cognition. Mahwah, N. J.: Erlbaum; 2001.
Howard J, Sheth JN. The theory of buyer behavior. New York: Wiley; 1969.
Kahneman D, Tversky A. Prospect theory: an analysis of decision under risk. Econometrica 1979;47:263–91.
Kambil A, van Heck E. Making markets: how firms can design and profit from online auctions and exchanges. Boston, MA: Harvard Business School Press; 2002.
Keller W. Are international R&D spillovers trade-related? Analyzing spillovers among randomly matched trade partners. Eur Econ Rev 1998;42:1469–81.
Kumar RL, Smith MA, Bannerjee S. User interface features influencing overall ease of use and personalization. Inf Manage 2004;41(3):289–302.
Lee H, Malmendier U. Do consumers know their willingness to pay: evidence from eBay auction. Stanford working paper; 2005.
Melnick MI, Alm J. Does a seller eCommerce reputation matter? Evidence from eBay auctions. J Ind Econ 2002;50:337–50.
Mitchell VW, McGoldrick P. Consumers' risk–reduction strategies: a review and synthesis. Int Rev Retail Distrib Consum Res 1996;6:1–33.
Podolny J. A status-based model of market competition. Am J Sociol 1993;98:829–72.
Popielarz D. An exploration of perceived risk and willingness to try new products. J Mark Res 1967;4:368–72.
Russo E, Meloy M, Medvec V. Predecisional distortion of product information. J Mark Res 1989;26:438–52.
Rynes SL, Bretz RD, Gerhart B. The importance of recruitment in job choice: a different way of looking. Pers Psychol 1991;44:487–521.
Salancik G, Preffer J. A social information processing approach to job attitudes and task design. Adm Sci Q 1978;23:224–53.
Schoonhoven C, Eisenhardt K, Lyman K. Speeding products to market: waiting time to first product introduction in new firms. Adm Sci Q 1990;35:177–207.
Shankar V, Urban G, Sultan F. Online trust: a stakeholder perspective, concepts, implications, and future directions. J Strateg Inf Syst 2002;11:325–44.
Standifird S. Reputation and e-commerce: eBay auctions and the asymmetrical impact of positive and negative ratings. J Manage 2001;27:279–95.
Stauss B. Using new media for customer interaction: a challenge for relationship marketing. In: Henning-Thurau T, Hansen U, editors. Relationship marketing. Berlin: Springer; 2000.

Stinchcombe A. Organization and Social structure. In: James G. March, editor. Handbook of organizations. Chicago: Rand McNally; 1965. p. 153–93.
Swait J, Erdem T. Temporal consistency of sales promotions and consumer preferences. J Mark Res 2002;39:304–20.
Taylor SE. Asymmetrical effects of positive and negative events: the mobilization–minimization hypothesis. Psychol Bull 1991;110:67–85.
Wang Y, Emurian H. An overview of online trust: concepts, elements, and implications. Comput Hum Behav 2005;21:105–25.
Weinberg BD, Davis L. Exploring the WOW in online-auction feedback. J Bus Res 2005;58: 1609–21.
Weigelt K, Camerer C. Reputation and corporate strategy: a review of recent theory and applications. Strateg Manage J 1988;9:443–54.
Wong K, Kwong J. Between-individual comparisons in performance evaluation: a perspective from prospect theory. J Appl Psychol 2005;90:284–94.
Zimmerman M, Zeitz G. Beyond survival: achieving new venture growth by building legitimacy. Acad Manage Rev 2002;27:414–32.