ARE BAD REVIEWS ALWAYS STRONGER THAN GOOD? ASYMMETRIC NEGATIVITY BIAS IN THE FORMATION OF ONLINE CONSUMER TRUST

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ASYMMETRIC NEGATIVITY BIAS IN THE FORMATION OF 
ONLINE CONSUMER TRUST 

Completed Research Paper

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Abstract

This research examines asymmetric negativity biases in the formation of consumer trust in an online environment. Drawing on prospect theory and social psychology literature, the authors propose that online consumers will exhibit more negative bias for information regarding sellers’ integrity than for information regarding sellers’ competence. Two experiments manipulated the dimension of seller behavior by presenting text reviews (Study 1) and ratings (Study 2) in a typical online word-of-mouth setting. As predicted, although negativity bias does impact trust formation in this setting, the magnitude of the bias depends on the dimension of seller behavior involved: consumers exhibit much more bias toward information regarding sellers’ integrity than toward information regarding sellers’ competence. The authors also discuss the theoretical and practical implications of these results.

Keywords: online trust, competence, integrity, negativity bias, feedback mechanisms, online word-of-mouth, consumer decision-making
Introduction

Trust is essential in facilitating exchange relationships between buyers and sellers (Doney and Cannon 1997; Grayson et al. 2008). Marketing strategies in an online environment also rely on building consumer trust. Compared with conventional face-to-face transactions, online interactions with unfamiliar sellers contain elements of uncertainty and risk (Reichheld and Schefter 2000). Because online sellers can easily take advantage of buyers, trust with conventional face-to-face transactions, online interactions with unfamiliar sellers contain elements of uncertainty and risk (Reichheld and Schefter 2000). Because online sellers can easily take advantage of buyers, trust is vital in the development of such buyer-seller relationships (Bart et al. 2005; Jarvenpaa and Todd 1996; Jarvenpaa and Tractinsky 1999).

Modern consumers have access to various forms of information that help reduce uncertainty and build trust in online retailers. Online user reviews (i.e., word-of-mouth), one of these technological mechanisms, can partially eliminate uncertainties arising from fake online identities and lack of contextual cues in transactions (Dellarocas 2003), thereby increasing seller reputation, online sales and price premiums (Ba and Pavlou 2002; Chevalier and Mayzlin 2006; Pavlou and Dimoka 2006; Zhu and Zhang 2010). As a result, most major electronic commerce (e-commerce) vendors, such as eBay.com and Yahoo! Shopping, have adopted review systems and accumulated a huge number of reviews for buyers to peruse. Bizrate.com, a dedicated third-party review site, even collects feedback and ratings from customers of thousands of online retailers immediately after purchase and after expected order receipt (Bizrate 1996).

Not surprisingly, online reviews have become an increasingly popular topic in academia. This research examines asymmetric negativity biases in the formation of trust when consumers read online reviews. When decision making involves uncertainty, human beings’ rationality is limited by the information and time they have (Simon 1956), and they often resort to heuristics (Baron 2006). In this case, negativity bias, the phenomenon in which losses loom larger than gains, may arise (Kahneman and Tversky 1979). Addressing whether negativity bias is present and universal in the risky online environment can help scholars to better understand online consumers’ trust formation and decision-making processes. If consumers are systematically biased in favor of overweighing negative reviews, online retailers should strive to avoid behaviors that trigger negative reviews. More importantly, if some bad reviews are more destructive than others, online stores with limited resources should tackle the most important issues first.

Negativity bias has been well documented in prior studies. Social psychology literature has constantly observed that people are generally more persuaded by negative information than by positive information in social interactions (Baumeister et al. 2001; Rozin and Royzman 2001). In addition, numerous studies found that buyers do not weigh negative and positive feedback equally in e-commerce (Lucking-Reiley et al. 2007). Negative reviews have a stronger impact than positive reviews on sales and price premiums (Ba and Pavlou 2002; Chevalier and Mayzlin 2006).

Despite abundant evidence of negativity bias, its robustness in the online environment may be overstated. As far as we know, no studies have explored the conditions under which negativity biases are likely to emerge, be attenuated, or even be reversed in the formation of online consumer trust. It is almost impossible to examine this topic using the empirical method, because measurements of trust and corresponding beliefs are generally unavailable in secondary data. Although many survey-based studies on trust did measure this construct (e.g., Ba and Pavlou 2002), the survey methodology does not allow them to effectively capture the potential biases in trust formation or to examine the conditions under which such biases are likely to occur.

To address this gap, we take an experimental approach and ask the following research question: Are all bad reviews created equal? Particularly, if consumers exhibit negativity biases in the formation of trust when exposed to online reviews, under what conditions are such biases likely to emerge? Under what conditions are such biases less likely to occur? Drawing upon social psychology literature, we propose that consumers generally exhibit a negativity bias, but its magnitude depends on the dimension of seller behavior involved. The experimental method enables us to capture the potential biases and directly test these hypotheses.

This research contributes to literature on trust formation and online feedback mechanisms in several ways. While prior empirical studies found negativity bias with regard to sales and price premiums, we also found evidence for its existence in the formation of online consumer trust. More importantly, we explored the conditions under which negativity bias is likely to occur in e-commerce. In two experiments using verbal reviews and ratings, we observed asymmetric negativity biases. In other words, bad reviews are not always stronger than good ones. When a negative review refers to competence (vs. integrity), the potential negativity bias is likely to be attenuated. Therefore, the negativity bias observed in prior empirical studies may be overstated. Our results have important practical...
implications for online retailers seeking to establish trust among potential customers: e.g., negative word-of-mouth regarding integrity is particularly destructive, and should be handled proactively.

Theoretical Framework

Trust and Trustworthiness

The multidisciplinary nature of trust gives rise to its various conceptualizations (Colquitt et al. 2007; Mayer et al. 1995), while this paper focuses on first-time consumers’ initial trust in an unfamiliar Web vendor (Mcknight et al. 1998). We define trust as “the willingness of a party to be vulnerable to the actions of another ...” (Mayer et al. 1995, p. 712). Trust differs from trustworthiness (Mayer et al. 1995) or trusting beliefs (Mcknight et al. 1998), which capture the characteristics of the party being trusted. Trustworthiness appears as an antecedent and driver of trust (Mayer et al. 1995; Mcknight et al. 1998), and it is central to understanding and predicting trust (Colquitt et al. 2007). In this paper we will use the term trustworthiness, which is interchangeable with trusting beliefs in McKnight et al.’s (1998) model.

Different from trust, trustworthiness is a multifaceted construct (Colquitt et al. 2007; Schlosser et al. 2006). Researchers have proposed and tested a variety of its dimensions, finding competence, integrity, and benevolence to be a solid and parsimonious set (Mayer et al. 1995). In the online environment, competence is a buyer’s belief about the skills and abilities of the seller; integrity is a buyer’s belief that the seller adheres to accepted rules of conduct, such as honesty and keeping promises; and benevolence is a buyer’s belief that the seller wants to do good to the buyer, aside from chasing a legitimate profit (Gefen 2002). These dimensions tap into different aspects of trustworthiness. Competence captures the “can-do” component of trustworthiness, while integrity and benevolence capture the “will-do” component (Colquitt et al. 2007). Since both integrity and benevolence are based on the internal intentions of the party being evaluated, they are often difficult to separate in initial interactions when consumers try to assess the internal aspects of a seller. Therefore, we limit our scope to competence and integrity in this paper.

Negativity Bias

In the development of online trust, consumers’ processing of positive and negative information may not be symmetric. Negativity bias is constantly observed in various domains, and researchers have proposed several explanations for this phenomenon (see Skowronski and Carlston 1989, for a review). Negativity bias means that bad is stronger than good: “bad things will produce larger, more consistent, more multifaceted or more lasting effects than good things” (Baumeister et al. 2001, p. 325). This tendency to overweight negative information has been established as a general principle of human judgment (Baumeister et al. 2001; Rozin and Royzman 2001). Specifically, negative information tends to have greater impact than comparably extreme positive information in the domain of sensory, memory, contamination, impression formation, emotional responses, etc. Negative information may carry more weight due to several reasons: 1) A negative cue is perceived to be more extreme because of the comparison of the cue with some internal standard or reference point assumed to be on the positive end of the scale (Helson 1964; Sherif and Sherif 1967). 2) A negative cue often refers to a non-normative behavior that is rare or novel, enhancing a perceiver’s ability to distinguish among people. Information that is rare or novel also receives more attention and processing time, resulting in the formation of more extreme impressions (Fiske 1980). 3) A negative cue is less ambiguous with smaller ranges of potential implications, thus being more persuasive (Birnbaum 1974; Wyer 1973).

Two additional theories that can help explain negativity bias are behavior adaptive theory and prospect theory. As a broad-level argument, behavior adaptive theory posits that organisms that are more attune to bad things would be more likely to survive threats and flourish, while those that are maladaptive to dangers may end up dead throughout their evolutionary history (Baumeister et al. 2001; Peeters and Czapinski 1990). In the online environment, interacting with an unfamiliar seller is highly risky (Reichheld and Schefter 2000), and consumers who are not aware of or susceptible to negative cues are very likely to end up being cheated. Some buyers may decide to not continue to purchase online, while others would learn from these lessons and become aware of negative information so that the same incidents would not happen again. In addition, Kahneman and Tversky’s (1979) prospect theory, which describes decisions between alternatives that involve risk, provides another perspective to explain the
tendency to overweigh negative information. This theory posits that people derive value from gains and losses according to a nonlinear “value function” that is concave for gains and convex for losses. Losses loom larger than gains; the suffering that one experiences in losing money appears to be greater than the pleasure associated with gaining the same amount (Kahneman and Tversky 1979). Applied to the risky online environment, consumers will be more concerned with potential losses than with potential gains. For instance, when consumers deal with incapable or immoral sellers, they often end up losing money without gaining any benefit (e.g., the product). In contrast, when consumers get what they want by paying for the product, there is no absolute gain, since they trade money in for the product. In summary, all these theories predict that consumers will weigh negative information more heavily than positive information.

**Information Diagnosticity**

As compelling as negativity bias is, there is also some evidence from social psychology literature suggesting that the bias can vary. People make use of new information to diagnose which category a person falls into. A piece of information is diagnostic if it is informative for people to form impressions or make judgments (Feldman 1999). The category diagnosticity model separates person-relevant information into ‘competence’ and ‘morality’ domains, and argues that people process positive and negative information about competence versus integrity in a fundamentally different way (Martijn et al. 1992; Skowronski and Carlston 1987). Specifically, this model suggests that people tend to weight negative information more heavily if the information refers to morality, but they tend to weight positive information more heavily if the information refers to competence.

On one hand, people intuitively believe that competent people can demonstrate different levels of performance depending on task demands and external factors, while incompetent people can only perform at levels that are equivalent to or lower than their competence level. Therefore, a single success is a reliable indicator of competence, because those who are incompetent would not be able to achieve that performance level. Nonetheless, a single failure is generally discounted as a signal of incompetence, because those who are competent can occasionally perform poorly due to obstacles, fatigue, or lack of motivation (see Snyder and Stukas 1999, for a review).

On the other hand, people intuitively believe that moral people exhibit honest behaviors all the time, while immoral people may exhibit either honest or dishonest behaviors depending on their incentives and opportunities. Thus, a single honest behavior is typically discounted as a signal of morality, because those who are dishonest can also behave honestly when there are benefits for behaving honestly. However, a single dishonest behavior is generally considered as a reliable indicator of immorality, because only dishonest people would behave in that way (Kim et al. 2006; Kim et al. 2004).

By applying this domain-specific approach to the current setting, we predict that the extent of consumers’ negativity bias in the formation of online trust depends on the dimension of seller behavior involved. As behavioral adaptive theory and prospect theory suggest, negative information is more likely to have a greater impact than positive information in the risky online environment. On the other hand, due to the distinct natures of competence and integrity, the relative impacts of negative information pertaining to different domains are likely to differ. As the category diagnosticity model suggests, negative information about integrity is more informative than positive information about integrity, but this is not necessarily the case for information about competence. Correspondingly, consumers exposed to negative integrity reviews will display more bias in their perceived trustworthiness than those exposed to negative competence reviews. Thus, we propose the following hypothesis:

**H1:** The negativity bias in consumers’ perceived trustworthiness when they read reviews regarding sellers’ integrity is stronger than when they read reviews regarding sellers’ competence.

Additionally, according to the theory of reasoned action (Fishbein and Ajzen 1975), an individual’s beliefs affect one’s attitudes, which in turn affect one’s intention to perform the behavior. Therefore, we believe that the bias in perceived trustworthiness will carry over into trust, which will in turn affect intention to purchase, defined as a buyer’s willingness to buy online from the seller and complete the transaction (Jarvenpaa and Tractinsky 1999; Reichheld and Schefter 2000). Therefore, we put forward the following hypotheses:

**H2:** The negativity bias in consumers’ trust when they read reviews regarding sellers’ integrity is stronger than when they read reviews regarding sellers’ competence.

**H3:** The negativity bias in consumers’ intention to purchase when they read reviews regarding sellers’ integrity is stronger than when they read reviews regarding sellers’ competence.
We took an experimental approach and conducted two studies to test our hypotheses. These two studies manipulated the dimension of seller behavior by presenting text reviews (Study 1) and ratings (Study 2) in a typical online word-of-mouth setting.

**Study 1: Text Reviews**

The goal of Study 1 is to capture the negativity biases, if any exist, as potential consumers check online stores’ text reviews, and to examine whether the magnitudes of the biases with regard to competence and integrity reviews are the same. This study used written reviews as experimental stimuli, since text reviews are commonly used and are realistic in e-commerce websites. Nevertheless, the richness of information contained in text reviews also makes it more difficult to manipulate valence without the confounding effects of extremity. We conducted a series of pretests to eliminate this confounding factor, as documented in the method section.

Participants imagined that they were shopping online and had tentatively selected one online retailer. They were asked to read several text reviews of this retailer before making a decision. First, each participant saw the same three text reviews. These reviews were all neutral, providing a baseline impression for the participants so that we can capture their biases apart from this baseline. Then they read two additional extreme reviews related to either competence or integrity. These two reviews, one positive and one negative, were equally extreme so that the biases can be captured by any belief change resulting from reading the reviews. Moreover, we can ensure that the bias is not driven by the differences in the extremity of review materials.

**Method**

This study had two conditions: a competence condition and an integrity condition. Participants served as their own control, since we measured their beliefs and attitude both before and after they were exposed to the two treatment reviews. Because it did not make sense to ask purchasing intention more than once for the same store, we did not include intention to purchase in this study.

**Stimulus Material**

We conducted several rounds of pretests using a different sample of undergraduate students to identify treatment and baseline reviews. Treatment reviews were required to meet the following criteria: 1) they needed to be both informative and single dimensional to ensure the successful manipulation of review dimension (i.e., competence and integrity); 2) they needed to be extreme; 3) the two reviews in either dimension needed to be opposite in valence, and 4) the same in extremity. The three baseline reviews would be optimal if they met the following criteria: 1) they were not as detailed as the treatment reviews; 2) each review was relatively neutral; and 3) the three reviews together covered both the competence and integrity of a seller.

We built the treatment and baseline reviews based on real ones. We collected an initial pool of text reviews from e-commerce platforms (e.g., eBay.com, Yahoo! Shopping), third-party review sites (e.g., BizRate.com), as well as prior literature. First, we constructed two sets of candidate treatment reviews conveying information on competence and integrity, respectively, and sent them to pretests. Pretest subjects classified each review into one or more categories representing the dimensions of trustworthiness, and then rated the valence and extremity of each review for the categories they had chosen on a nine-point scale (1 = “Extremely Incompetent (Dishonest)” and 9 = “Extremely Competent (Honest)”). After each round of pretests, we retained those reviews that were assigned to the “correct” category by over 75% of the subjects and to the “incorrect” category by less than 25% of subjects. If a review failed to meet these criteria, we revised that review to remove ambiguity and tested it again until it met the criteria. In the end, we got our candidate treatment review pool in the final pretest (N = 41), and selected two extreme reviews for each category as treatment materials. The two reviews in each dimension were not significantly different with regard to extremity. They are shown in Table 1.
Table 1. Treatment Reviews

<table>
<thead>
<tr>
<th>Category</th>
<th>Review Content</th>
<th>Extremity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competence</td>
<td>Our family has ordered numerous items from them. It's easy to do and their order processing is fantastic! Anything you need during the purchase is on their online system. They'll always have my business.</td>
<td>3.2</td>
</tr>
<tr>
<td></td>
<td>They are not capable of packaging at all! Shipping box was sent with no indication that there was a TV in the box or that it may be fragile. As a result, My LCD TV came with obvious shipping damage. They really need to have some basic training on packaging before running a company!</td>
<td>-3.1</td>
</tr>
<tr>
<td>Integrity</td>
<td>This vendor is very trustworthy. I needed my camcorder as soon as possible, and their site warns you which items may take longer to ship. Very honest in my opinion.</td>
<td>3.2</td>
</tr>
<tr>
<td></td>
<td>Bait and switch artists. Advertised one thing on their website … we ordered after making sure it was in stock and what we wanted, but then they tried to send us something else. After I complained, they changed the ad. Beware! Never believe what they say!!</td>
<td>-3.2</td>
</tr>
</tbody>
</table>

Next, we developed and pretested a set of baseline reviews to provide a common reference point and to ensure that participants’ perceived trustworthiness after reading them would be relatively neutral with regard to both competence and integrity. As in the experiment, in order to place a camera order, pretest subjects were asked to check the store’s feedback at a third-party site, read the three neutral reviews posted in the past two weeks, and rate their perceived trustworthiness. We revised these neutral reviews after each round of pretests until the participants’ average perceived trustworthiness in both dimensions got to roughly neutral after reading them. The three neutral reviews are shown in Table 2.

Table 2. Baseline Reviews

<table>
<thead>
<tr>
<th>#</th>
<th>Review</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Their website is OK overall but can be a bit of a hassle. It took me a while to find the button when I tried to add a camera to the shopping cart. Check out was relatively straightforward, though.</td>
</tr>
<tr>
<td>2</td>
<td>We bought a television that did not work as well as we had hoped. They told us we could return it if we paid for the shipping. It is mentioned in their return policy, but they did not state the return shipping fee clearly upfront.</td>
</tr>
<tr>
<td>3</td>
<td>There were a few issues with my order but it went through in the end. Looking back, I would probably make the same decision, but I would only rate them as average.</td>
</tr>
</tbody>
</table>

Procedure

Eighty-two undergraduate students from a southeastern U.S. university participated in this study for course credit. The study was run on lab computers in sessions of no more than 16 people at a time. Upon arrival, participants signed a consent form. Then they were asked to imagine that they were shopping online for a digital camera. They had already decided on the model they were interested in and browsed a number of different online electronics retailers that offer this model. After considering various factors (price, shipping, etc.), they had tentatively selected one particular seller, “ElectronicWorld.com,” a counterfeit store. In order to decide whether to place their order from this seller, participants visited a third-party website that provides consumer text reviews of online stores. Participants were asked to read five prior customers’ reviews about ElectronicWorld.com that were posted in the past two weeks. The first three reviews were pretested to be neutral in their implications regarding the seller’s competence and integrity. All participants saw these “baseline” reviews first so that they had the same general impression about the store to begin with. Next, participants read two additional extreme “treatment” reviews. We manipulated information dimension by randomly assigning participants to read two additional reviews pertaining to
either competence or integrity. The two reviews were presented in the same screen: one review was positive and the other negative. The order of these two reviews was counterbalanced. In addition, the two treatment reviews were pretested to be equally extreme so that we can rule out the confounding factor of extremity.

Measures

In order to capture belief and attitude changes, participants were asked to report perceived trustworthiness and trust after reading baseline reviews and again after reading treatment reviews. We measured each dimension of trustworthiness by three items adapted from McKnight et al. (2002) and Serva et al. (2005). We gauged trust using three items adapted from Gefen (2000). We also measured propensity to trust and institution-based trust, which were supposed to influence trustworthiness and trust (McKnight et al. 1998). These measures are listed in Appendix.

Results

Manipulation Check

We performed various checks to determine whether the manipulation was successful. 1) Subjects reported whether they had transacted with ElectronicWorld.com in the past, and one replied yes. 2) We recorded the time participants used to read the two treatment reviews, and found 2 subjects whose reading time is below two standard deviation of the mean (i.e., 1.32 and 7.42 seconds respectively). 3) We asked participants in the end to recall whether they had read the two treatment reviews earlier, and 74 participants replied yes to both reviews. Thus, we dropped the subjects who failed any of these manipulation checks. This step resulted in a sample size of 72, with 38 in the competence group.

Reliability and Validity

Before further analysis, we examined the reliability and validity of major constructs in this study. We used subjects’ responses after they read all text reviews. Cronbach’s alphas for all constructs are well above .70, demonstrating adequate internal consistency (reliability) (Nunnally 1967). Therefore, the average score of each construct was calculated and used in further analysis. Descriptive statistics, reliabilities, and correlations of the study variables are shown in Table 3.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>s.d.</th>
<th>Alpha</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Competence</td>
<td>3.785</td>
<td>1.029</td>
<td>.827</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Integrity</td>
<td>3.653</td>
<td>1.342</td>
<td>.956</td>
<td>.665*</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Trust</td>
<td>3.259</td>
<td>1.407</td>
<td>.943</td>
<td>.694*</td>
<td>.916*</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Propensity to Trust</td>
<td>4.711</td>
<td>1.112</td>
<td>.874</td>
<td>.085</td>
<td>.165</td>
<td>.185</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>5. Institution-based Trust</td>
<td>5.410</td>
<td>1.188</td>
<td>.850</td>
<td>-.159</td>
<td>.023</td>
<td>.089</td>
<td>.189</td>
<td>-</td>
</tr>
</tbody>
</table>

Note: N = 72.

* p < .05.

Next, we conducted a confirmatory factor analysis (CFA) to assess the convergent and discriminant validity of competence and integrity (Bagozzi and Phillips 1982), which tap into different aspects of trustworthiness. Allowing perceived competence and perceived integrity to freely correlate with each other, CFA indicates an acceptable fit (χ²(19) = 25.740, p = .138; RMSEA = .070; all item-factor loadings > .70), supporting convergent validity. The hypothesized two-factor model fits the data significantly better than the more parsimonious one-factor model (χ²(1) = 84.015, p < .001). Additionally, loadings of items on their corresponding latent factor are higher than loadings of other items on this latent factor and the loadings of these items on the other latent factor, indicating adequate discriminant validity of the two-factor model. The loadings and cross loadings are presented in Table 4.
Biases in Perceived Trustworthiness

First, we tested whether biases existed when participants in competence and integrity conditions perceive the trustworthiness of the seller. The average change of perceived competence in the competence group was significantly lower than 0 (Ms = 4.04 and 3.72, t(37) = -2.865, p < .05), and the average change of perceived integrity in the integrity group was also significantly lower (Ms = 4.07 and 3.32, t(33) = -4.270, p < .001). To control for the effects of baseline trustworthiness perception, as well as other covariates, we regressed participants’ change of perceived trustworthiness on their related baseline belief, propensity to trust and institution-based trust. The latter two contribute to trustworthiness theoretically (Mcknight et al. 1998), and they may also affect how trustworthiness changes. All continuous independent variables were scaled before regression: the middle point 4 was subtracted from subjects’ baseline belief, while the group mean was subtracted for other variables. The intercept indicates whether biases exist given neutral baseline belief and average levels of covariates. The intercept of the regression for participants in the competence group was significantly lower than 0 (Beta = -.317, t = -3.012, p < .01), and the intercept for participants in the integrity group was also significantly lower (Beta = -.694, t = -4.082, p < .001). Results were consistent with the T-tests above.

Next, we used repeated measure ANCOVA to test whether there was any significant difference in the change of trustworthiness between the two groups. Between-subject factors include the treatment review dimension (i.e., competence, integrity) and the order of treatment reviews (i.e., positive review first, negative review first). We used participants’ propensity to trust and institution-based trust as covariates. The significance of review dimension × treatment interaction term indicates that participants exhibited significantly different biases in their perceived trustworthiness when they are exposed to treatment reviews (p < .05), as illustrated in Figure 1.

![Figure 1. Negativity Biases in Trustworthiness in Study 1](image-url)
Biases in Trust

Next we turned to the biases in trust. The change of trust after reading treatment reviews was significantly lower than 0 for the integrity group (Ms = 3.77 and 3.11, t(33) = -3.419, p < .01), but not for the competence group (Ms = 3.57 and 3.39, t(37) = -1.314, p = .197). To control for the effects of baseline trust as well as other covariates, we regressed participants’ change of trust on their related baseline trust, propensity to trust and institution-based trust. Basic results were also consistent with the T-tests above.

We then used repeated measure ANCOVA to test whether there was any significant difference in the change of trust between the two groups. The significance of review dimension × treatment interaction term indicates that participants exhibit significantly different biases in trust when they are exposed to treatment reviews (p < .05), as illustrated in Figure 2.

![Figure 2. Negativity Biases in Trust in Study 1](image)

Discussion

Analysis of trustworthiness showed that participants weighted the negative review more heavily than they weighted the positive review, regardless of the domain of seller behavior involved. A probable reason is that participants in this study might have read through the text reviews carefully, exaggerating the potential biases in perceived trustworthiness in both conditions.

In addition, as predicted, when we compared the change of trustworthiness between the two conditions, the extent of bias was dramatically greater for the integrity condition. Similarly, analysis of trust revealed a negativity bias for participants in the integrity condition, but no significant bias for the competence condition. A plausible reason is that the negative integrity text review is relatively more diagnostic and informative than the negative competence text review. In summary, both H1 and H2 were supported.

Study 2: Profile Ratings

Study 2 extended our investigation from written reviews to seller ratings. In Study 1, we tried to capture potential biases and test proposed hypotheses by presenting individual text reviews of an online store. Instead, Study 2 used smiley face ratings as experimental stimuli for the following reasons: 1) Most feedback mechanisms provide a profile of ratings regarding several important criteria for a particular seller. These aggregated profiles are often the first clue a consumer can find as to the reputation of the seller. 2) The simplicity and unequivocal nature of ratings makes it much easier to manipulate the valence of information while holding the extremity constant. 3) We used smiley faces because participants could not easily calculate the mathematical mean of the ratings as they could when the ratings were numbers or stars.

Participants imagined that they were shopping online and had tentatively selected four online retailers. Then they read the rating profiles of each retailer one by one before making a decision. Each store’s profile was composed of two sections, one related to competence and the other related to integrity. The design of these two sections enables
us to examine the participants’ reactions to ratings referring to different information domains. In addition, each section listed three relevant items along with corresponding average ratings. After participants read each section with three ratings about the store’s competence or integrity, they rated their corresponding trustworthiness. Having three items for each section enables us to present both positive and negative information from one domain simultaneously and to capture the potential biases, if any.

**Method**

This study utilized a 2 (profile dimension: competence, integrity) × 2 (profile ratings: treatment, control) within-subject design to test whether potential consumers weigh negative ratings more heavily than positive ratings in the formation of online trust, and whether the relative impact of negative ratings pertaining to different domains differs.

**Stimulus Material**

We first constructed two sets of three items to display together with ratings in two profile sections. The selected items needed to meet the following criteria: 1) Each item needed to correspond to either competence or integrity, but not both. The purpose of constraining each item to a single dimension is to ensure the successful manipulation of profile dimension and to alleviate alternative explanations. 2) The three items in a section needed to cover different aspects of that particular dimension so that we could manipulate profile ratings by assigning different combinations of ratings to the items in a section. If the three items covered the same aspect, assigning different ratings to the items would appear self-contradictory and artificial for participants.

We built the items by summarizing the common themes from real text reviews and real categories. We used the initial text review pool developed in Study 1, and also collected the profile categories currently used in websites. We then summarized the common themes, ensured their exclusiveness in content, and pretested the generated items for single dimensionality. Pretest subjects were asked the extent to which each item relates to a store’s competence and integrity, respectively, on a seven-point scale (1 = “Not Related” and 7 = “Highly Related”). An item is ideal if it has little overlap in content with other items in the same dimension, is highly related to the supposed dimension, and is not related to the other dimension. Based on their evaluations, we revised the wordings until they could satisfy the two criteria listed above. The final items are listed in Table 5.

<table>
<thead>
<tr>
<th>Table 5. Items Used in Store Profiles in Study 2</th>
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<td><strong>Section</strong></td>
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<td>Competence</td>
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<td>Integrity</td>
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**Procedure**

Thirty-five undergraduate students received extra credit for participating. Participants were asked to imagine that they were shopping online for a digital camera. As in Study 1, they had already decided on the model and browsed a number of different online electronics retailers. After considering various factors, they had tentatively selected four stores, with labels A, B, C, and D. In order to decide on one store and place their order, they visited a third-party website that provides consumer reviews of online stores. In order to help participants understand and prepare for the task, they were first shown the ratings profile of a practice store, “Store X,” as well as the definitions of competence and integrity.

Then they read the rating profiles of each store one by one before making a decision. Each store’s profile has two sections displayed on separate screens. We manipulated profile dimension (i.e., competence and integrity) through
the dimension of items used in the first section of a store profile. Half of the four stores had profiles starting with the competence section, and the other half had profiles starting with the integrity section.

Each section presented three relevant items along with corresponding average ratings, as shown in Figure 3. All ratings were presented using a five-point “smiley face” scale. We manipulated profile ratings by assigning different combinations of ratings to the items in the first profile section. The three ratings for treatment stores’ first profile section were “neutral”, “very positive” and “very negative”, while those for control stores were all “neutral”. The order of the extreme ratings in the treatment stores’ first profile section is counterbalanced. Additionally, ratings in the second profile section were identical between treatment and control stores. The order in which the four stores appear was counterbalanced. A treatment store lay adjacent to a control store, and two adjacent stores’ first profile sections lay along different dimensions.

![Figure 3. Screen Shot of Profile’s Integrity Items in Study 2](image)

**Measures**

After participants read each section with three ratings about the store’s competence or integrity, they rated their corresponding trustworthiness. They were asked how incompetent/competent (dishonest/honest) they would say that the particular store was overall based on the profile ratings on the screen. We used the same “smiley face” scale as item ratings but with different anchors (1 = “Very Incompetent (Dishonest)” and 7 = “Very Competent (Honest)”). When they finished the whole profile of a store, they also reported their trust in and intention to buy from that particular store. We measured trust in the same way as in Study 1. We measured intention to purchase using three items adapted from Jarvenpaa et al. (2000) and Pavlou (2003) on a seven-point scale (1 = “Extremely Unlikely” and 7 = “Extremely Likely”).

**Results**

**Manipulation Check**

At the end of the experiment, we asked subjects to rate the extent to which each profile item relates to a store's competence and integrity. We averaged the scores of the three items in each dimension. One sample T-test indicated that the competence items were perceived to be more related to competence than to integrity (Ms = 5.61 and 3.44;
t(34) = 7.03, p < .001), and that integrity items were perceived to be more related to integrity than to competence (Ms = 6.28 and 5.17; t(34) = 3.87, p < .001). Therefore, our manipulation of profile dimension was successful.

**Biases in Perceived Trustworthiness**

We first compared the participants’ corresponding trustworthiness after they read the treatment store’s first section with the neutral point in the “smiley faces” scale, which was also the average of three ratings in the first profile section. Perceived integrity differed significantly from the neutral point (M = -0.94; t(34) = -7.69, p < .001), while perceived competence did not (M = -0.17; t(34) = -1.36, p = .183). We also compared participants’ perceived trustworthiness between treatment and control stores with straight neutral ratings. Results again showed that perceived integrity of the treatment store was significantly lower than that of the control store (Ms = 2.06 and 2.91; t(34) = -6.565, p < .001), while perceived competence of the treatment store was not significantly lower (Ms = 2.83 and 2.89; t(34) = -0.387, p > .5). Therefore, results revealed that participants’ perceived integrity was lower than neutral and lower than the control store, but their perceived competence was not.

Next, a 2 × 2 repeated measure ANOVA with profile dimension and profile ratings as within-subject factors conducted on perceived trustworthiness revealed a significant main effect of profile dimension (F(1,33) = 17.900, p < .001), a significant main effect of profile ratings (F(1,33) = 21.281, p < .001), and a significant interaction between the two (F(1,33) = 16.702, p < .001), as illustrated in Figure 4. Planned contrasts indicated that the negativity bias for perceived competence was not significant (p > .5) while that for perceived integrity was significant (p < .001).

![Figure 4. Negativity Biases in Trustworthiness in Study 2](image)

**Biases in Trust and Purchasing Intention**

We measured subjects’ trust and intention to purchase after they inspected the complete profile of each store, enabling us to examine the biases in the formation of downstream attitude and intentions. We averaged participants' answers to the corresponding questions to form a reliable index of trust and purchasing intention. Trust toward the integrity treatment store was significantly lower than that toward the control store (Ms = 2.62 and 3.85; t(34) = -5.236, p < .001), while trust toward the competence treatment store was not significantly lower (Ms = 3.67 and 3.85; t(34) = -1.009, p > .3). Similarly, intention to purchase from the integrity treatment store was significantly lower that from the control store (Ms = 2.62 and 3.80; t(34) = -3.674, p = .001), while the purchasing intention for the competence treatment store was not significantly lower (Ms = 3.49 and 3.88; t(34) = -1.560, p > .1).

Then we ran a 2 × 2 repeated measure ANOVA with profile dimension and profile ratings as within-subject factors conducted on trust and purchasing intention. Analysis results showed that the extent of the negativity bias in the formation of trust and purchasing intention also differed between competence and integrity dimensions (p < .001), as shown in Figure 5. The aroused negativity bias seemed to get carried over into trust and eventually purchasing intention, consistent with existing trust models. To confirm this, we also conducted a mediation analysis to test whether trust mediated the effect of trustworthiness on purchasing intention. A Sobel test confirmed that trust mediated the effect of perceived competence on purchasing intention (z = 1.89, p = .059) and the effect of perceived integrity on purchasing intention (z = 4.43, p < .001).
**Discussion**

This study differs from Study 1 in several ways. 1) We used “smiley face” ratings in this study, whose simplicity and unequivocal nature makes it much easier to manipulate the valence of information while holding the extremity constant. 2) We utilized a within-subject design to manipulate information dimension so that we can tease out participants’ individual differences in responding to competence-related and integrity-related information.

In summary, consistent with behavior adaptive theory and prospect theory, participants did not exhibit positivity bias when they were exposed to both positive and negative ratings in online retailer’s profiles. Using “smiley face” ratings in the profiles, we were able to manipulate the valence of ratings while controlling for the extremity and other aspects of positive and negative cues. Results revealed that negative information is more likely to exert a greater impact than positive information rather than the other way around, which is probably because participants were more concerned with potential losses than with potential gains in the risky e-commerce environment.

Moreover, as we expected, negativity bias implied by a lower evaluation of treatment stores was not universal, but rather depended on the category of seller behavior involved. Participants who checked integrity treatment stores’ profile ratings were negatively biased in their perceived trustworthiness, trust and purchasing intention; however, none of these biases were significant for participants who checked competence treatment stores’ profile ratings. Participants were more biased toward ratings related to integrity, presumably because negative information in this domain is relatively more diagnostic and informative than information in competence domain. Thus, H1, H2 and H3 are all supported in this study.
General Discussion

Prior studies found that both ratings (Ba and Pavlou 2002; Clemons et al. 2006) and text reviews (Pavlou and Dimoka 2006) impact the formation of customers’ trust towards online stores. Moreover, even a limited number of “bad” reviews from prior consumers have stronger impact than good reviews on sales and price premiums (Ba and Pavlou 2002; Chevalier and Mayzlin 2006). In contrast, the current research focuses exclusively on the phenomenon of negativity bias and proposes that consumers may generally exhibit a negativity bias; however, the magnitude of this bias depends on the dimension of seller behavior involved. Specifically, consumers will be more negatively biased in the formation of perceived trustworthiness, trust and purchasing intention when they are exposed to reviews referring to sellers’ integrity than when exposed to reviews referring to sellers’ competence.

We found evidence for these hypotheses by manipulating review valence through text reviews in Study 1 and through profile ratings in Study 2. Even when the negative text reviews regarding competence were stronger than the positive reviews in influencing trustworthiness in Study 1, the magnitude of the negativity bias differs significantly between competence and integrity conditions. In other words, consumers will exhibit more negative bias for information regarding sellers’ integrity than for information regarding sellers’ competence. The converging evidence from the two studies provides us with more confidence to conclude that bad reviews are not necessarily stronger than good ones. It is only in the integrity domain that negative reviews dominated the positive ones.

Theoretical Implications

As far as we know, our paper is among the first to focus exclusively on the important phenomenon of negativity biases in the online environment. We examined whether negativity biases found in prior empirical studies with regard to sales and price premiums are also likely to exist in the formation of online consumer trust. Not surprisingly, we found that negativity bias does impact trust formation in the e-commerce setting, and that this bias could carry over into purchasing intentions, which may ultimately affect sales and price premiums.

Second, this research utilized two carefully designed experiments to capture the potential biases in the formation of online consumer trust. Unlike prior survey and empirical studies, we carefully manipulated information valence through text reviews in Study 1 and “smiley face” ratings in Study 2, while holding the stimulus extremity constant. In particular, we investigated whether combinations of positive and negative text reviews or ratings yield overall evaluations that are more negative than the algebraic sum of individual subjective valences. Therefore, we answered the negativity dominance question which is the most robust and most common exemplification of negativity bias (Rozin and Royzman 2001).

Third, we explored the conditions under which negativity biases are less likely to occur in the formation of online consumer trust. We compared the magnitude of biases under various conditions and found that “bad reviews are not always stronger” in e-commerce. In particular, consumers exhibit much more bias toward information regarding sellers’ integrity than toward information regarding sellers’ competence. Our results showed that the negativity bias observed in prior empirical studies might be overstated. When a store’s negative review refers to its competence, the review’s stronger effects relative to a positive one are likely to be attenuated.

Fourth, although negativity bias and its qualifications have been well documented in social psychology literature, this line of research on impression formation often asked subjects to form an accurate impression of targets (Ahluwalia 2002). In contrast, online consumers need to evaluate different sellers in order to select a transaction partner, not simply forming an accurate impression. Whether online consumers would exhibit the same asymmetric negativity biases as the impression formation literature demonstrated is still open to doubt. Therefore, we focused on the e-commerce context in which sellers’ ultimate goal is to persuade buyers to pay. We found that negativity bias is more likely to emerge when consumers read reviews pertaining to integrity, but this bias is likely to be attenuated when they read reviews pertaining to competence. It should be noted that we failed to find positivity bias in the competence domain, which is most likely due to the risky nature of e-commerce in which online consumers were more concerned with potential losses than with potential gains.

Managerial Implications

Our results also have practical implications for retailers seeking to establish trust among potential customers. Negative ratings or reviews are generally weighted more than their positive counterpart, rather than the other way
around. Once negative reviews were posted online, it would probably take many more positive deeds to overcome the generated bad impact due to asymmetric weights. Therefore, it is beneficial for online stores to preemptively avoid negative ratings and reviews whenever possible. For instance, they could try their best to resolve the problems before the bad reviews are posted, or to communicate with dissatisfied customers to earn their forgiveness so that they will revoke their negative reviews. This implication is consistent with findings from prior studies (Ba and Pavlou 2002; Chevalier and Mayzlin 2006).

More importantly, on the other hand, we found that negative word-of-mouth regarding integrity is more influential than word-of-mouth regarding competence. We are not saying that competence matters less than integrity, but rather that people are more sensitive to negative information in reference to sellers’ integrity than in reference to sellers’ competence. Therefore, online stores with limited resources should focus on handling integrity issues proactively before dealing with lower priority issues.

**Future Research**

While the results obtained from these two studies supported our hypotheses, many other interesting directions are worth pursuing in future studies. First, benevolence, in addition to competence and integrity, is also an important dimension of trustworthiness. We already observed the distinct nature of ratings and reviews pertaining to competence and integrity, and it will be interesting to also explore the nature of ratings and reviews regarding benevolence.

Second, what is the level of difficulty necessary to recover trust when it is violated by negative reviews or ratings? What are the best strategies to deal with those bad reviews? These are out of our current scope, but are surely interesting. Are negative reviews pertaining to sellers’ integrity more difficult to overcome than those pertaining to sellers’ competence? After trust is violated by the negative reviews or ratings, which strategy is more effective in recovering trust: apology, denial, or simply remaining silent? All of these questions open up exciting new directions for future studies.

Third, in addition to text reviews and profile ratings, what other sources of information can convey online retailers’ competence and integrity? For instance, the website quality can signal competence, while the presence of third-party seals may signal integrity. An interesting question is: will online consumers exhibit the same pattern of biases when exposed to these information sources? If so, all the implications discussed previously also apply to these information sources.

Finally, what kind of online word-of-mouth information is most likely to be remembered: negative or positive information? Can consumers recall competence-related and integrity-related information equally well? These questions are critical because online consumers often seek large amounts of information from different online stores before making a decision, and their memory of the relative strengths and weaknesses of different stores plays an important role in their purchasing decision.

**Appendix: Dependent Variables and Covariates**

Perceived competence (Mcknight et al. 2002; Serva et al. 2005).

- Store X* is competent and effective in selling electronics online.
- Store X performs its role of selling electronics online very well.
- Overall, Store X is a capable and proficient Internet seller of electronics.

Perceived integrity (Mcknight et al. 2002; Serva et al. 2005).

- I would characterize Store X as honest.
- Store X would keep its commitments.
- Store X is sincere and genuine.

Trust in vendor (Gefen 2000).

- I believe that Store X is trustworthy.
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- Even if Store X was not monitored, I would trust them to do the job right.
- I trust Store X.

Intention to purchase (Jarvenpaa et al. 2000; Pavlou 2003).

- For this purchase, how likely is it that you will buy from Store X?
- If you need to buy an electronic product in the future, how likely is it that you would consider making another purchase from Store X?
- How likely is it that you would transact with Store X in the near future?

Propensity to Trust (Gefen 2000).

- I generally trust other people.
- I tend to count upon other people.
- I generally have faith in humanity.
- I feel that people are generally reliable.
- I generally trust other people unless they give me reasons not to.

Institution-based Trust (Mcknight et al. 2002).

- I feel good about how things go when I do purchasing or other activities on the Internet.
- I am comfortable making purchases on the Internet.

* Note: “Store X” was replaced with the corresponding store’s name in experiments.

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References


