

Online Reputation Systems: The Effects of Feedback Comments and Reactions on Building and
Rebuilding Trust in Online Auctions

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Abstract

Previous research on reputation systems has primarily focused on the trust building function of reputation systems. The current research also addresses the trust rebuilding function of reputation systems, specifically, the role of the short text comments given in reaction to negative feedback. Online markets are noisy environments; rebuilding trust is therefore often necessary. The results of two experimental studies among actual eBay users show that the text comments accompanying negative feedback are influential towards trustworthiness judgments. It also makes a difference whether a trust violation is perceived as competence-based or morality-based. Moreover, plain apologies were observed to be more successful in repairing trust than denials. The effects were mediated by perceived believability of the comments. Thus, to avoid the detrimental effects of noise on trust, operators of online market places should encourage text feedback comments and reactions.

keywords: reputation systems, trust, trust reparation, apology, denial

Online markets face serious problems of trust between buyers and sellers. These users usually do not know each other, live in distant places, interact only for one single commercial transaction, and never interact again in the future. The seller runs the risk of not being paid for the sent product and the buyer runs the risk that the product is not sent at all, is not sent on a timely basis, or has quality deficiencies [13]. Online market systems reduce the risk of the buyer by making use of an online reputation system [23]. Both partners, buyers and sellers, evaluate each other after their transaction by entering publicly visible feedback into the reputation system. Many studies have examined in how far the numerical indicators in feedback profiles influence the probability of sales and price premiums [1, 3, 7, 14, 15, 28, 29]. The present study focuses on the effect of the accompanying text comments and the reactions of the accused party. The central question is how trust can be repaired after negative feedback.

Focusing on the text comments is important for two reasons. First, research suggests that the majority of eBay users read at least one page of text feedback comments about a seller [20]. Second, text comments that provide evidence for a seller's responsibility or credibility increase the price premium for the seller's product, while comments that provide evidence for irresponsibility or poor credibility serve to diminish it [20]. When this is taken into account, the extraordinary text comments explained an additional 20-30% of variance in price premiums [20]. However, there are still plenty of open questions. For instance, it is unclear whether or not only the buyer's text comments or whether the *reactions* of the seller on the comments of the buyer affect the subsequent perceived trustworthiness of the seller. Negative feedback diminishes the trust in the seller and the seller's reactions have the potential to rebuild the trust between business partners [11]. Until now, it has not been studied whether these short reactions show any impact on buyers' perceived trustworthiness towards the seller.

Knowledge about the trust rebuilding effects of seller reactions is important for a number of reasons. First, reputation systems work in a noisy environment. People may get sick, the shipping of a product may go wrong, and many other forms of mishap can take place for a seller. In these cases of ‘force majeure’ it is important for the seller to know how to rebuild trust in the most effective way. Second, although it is unlikely that the same buyer and seller will meet again, disappointed buyers are likely to generalize their perception of low trustworthiness from the individual seller to the whole community of sellers in the same online market [21]. Given that, even a few incidents of trust violation could have detrimental effects on the functioning of the whole online market. However, eBay and other online markets are still successful and functional. The reparation of trust may play an important role in this process. The central assumption of this paper is that the reactions of sellers on negative feedback can repair trust. The paper will also serve to answer the following questions: Do different types of trust violations have more or less detrimental effects on trust? Do reactions of sellers have any trust rebuilding effects? Which types of seller reactions are more effective in rebuilding trust?

In the next section we present the theoretical background of the study. We make a distinction between morality-based and competence-based violations of trust and between two types of reactions that a seller can display, namely an apology or denial of the trust violation [11]. Four hypotheses about trust-building and rebuilding effects were formulated. From these hypotheses two studies were designed, consisting of field experiments among active eBay users in the Netherlands. In the results section, it is shown that seller reactions indeed influence trustworthiness judgments. The results of the pilot study show that sellers who react on a negative feedback by showing an apology are more likely to be judged as trustworthy by a potential buyer than sellers who react by denying their responsibility. Apologies are also perceived as more believable than denials, and the effect of the seller's reaction is completely

mediated by this perceived believability of the reaction. Results of the main experiment indicate that "plain" apologies are more successful in eliciting high trustworthiness judgments than apologies which offer an explanation. However, contrary to what has been reported in the literature [11], it was consistently found that denial in case of morality-based violations of trust is *not* trust rebuilding. The paper concludes by discussing the theoretical and practical implications of these findings.

Theoretical Background

Trust and reputation systems

Trust is a central issue in online markets. Trust can be defined as "the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party" [17, p. 712]. Among others, trust is influenced by the disposition towards trust, a stable personality characteristic, and by the perceived trustworthiness. The latter comprises the perceived ability, integrity, and integrity of the interaction partner. These three dimensions correspond roughly to competence and morality, the two central dimensions in both person perception and trust research [cf. 35]. These terms will be used for the remainder of the paper. Trust in our context should be distinguished from behavioral trust, which consists of the actual taking of risk [17]. Behavioral trust can be influenced by the willingness to trust and by situational circumstances [12, 25]. The perception of the interaction partner plays a central role for the building and rebuilding of trust. When interactions are one-shot interactions between strangers, as it is often the case in online environments, it is more difficult to judge the competence or morality of a potential interaction partner.

Reputation systems are regarded as one key solution to the online trust problem [e.g., 1, 6, 13]. These systems collect and display information about the past behavior of an actor that can

be used to judge the trustworthiness of a potential interaction partner. The most studied reputation system is the feedback system of eBay [6]. On eBay, buyers and sellers can give each other positive, neutral, or negative feedback after a transaction. The feedback can be accompanied by short comments; and the interaction partner can in turn briefly react on the comments. The member profiles display various indicators: the percentage of positive feedback, the absolute number of positive, neutral, and negative feedback as received from unique other members. These data are available individually for the past month, the past six months, and the past 12 months.

Research on the impact of online reputation systems has almost exclusively focused on the numerical indicators displayed on the feedback profile. Various studies have collected data from online auctions and found that feedback scores may influence probability of sale and price premiums, measurements that can be interpreted as proxies of behavioral trust [1, 14, 15, 28, 29]. However, the results of these studies are mixed and interpretation is further hampered by the fact that market conditions such as the available alternative sellers at the moment of sale are inherently difficult to measure [cf. 28]. Only recently, Pavlou and Dimoka [20] analyzed the comments accompanying the feedback. Their study focused on the most extreme positive and negative comments (about 20% of all comments) and found that including these explains an additional 20-30% of variance in the price premium. As can be expected, extremely positive comments increased and extremely negative comments decreased the trust in the seller. Moreover, negative feedback does not only have consequences for the seller who received it, but also for the buyer who had the negative experience. Pavlou and Gefen [21] showed that negative experiences with one seller tend to be generalized to the community of the sellers. Buyers who felt that they have been mistreated by one seller gave lower estimates of overall degree of contract fulfillment for the whole community, which in turn lead to lower trust, lower transaction

intentions, and a higher perceived risk. These results underline the importance of trust *repairing* processes.

The reparation of trust, however, is not only important after actual trust violations, but also in noisy environments where breach of trust can easily appear to have happened [30]. Noise is defined as "differences between actual and intended outcomes due to unintended errors" [32, p. 768]. Online transactions are noisier than face-to-face transactions because they are mediated and there are more moments where things can go wrong. For instance, emails end up in the spam filter, computers crash, and parcels get damaged or lost. The reparation of trust is therefore more often necessary in noisy environments.

The reparation of trust

In research on noise as well as in research on the reparation of trust, communication turned out to play an important role. Previous studies on the reparation of trust have usually focused on the trust repairing role of *two trust repairing strategies*, apologies and denials [4, 19, 26]. Kim et al. argue that the *type of trust violation* moderates the effectiveness of these two strategies [11]. They distinguish between competence-based violations of trust ('does the seller have the skills required to fulfill his obligations?') and integrity-based violations of trust ('does the seller adhere to a set of general principles that the buyer finds acceptable?'). The latter we call morality-based violations of trust in this paper because many trust violations refer broadly to the morality domain, not only to the absence of adherence to principles. Moreover, the differential effectiveness of the two trust repairing strategies is explained by the positive-negative asymmetry in impression formation (see below), an area of research which also uses the more general terms competence and morality [35].

According to Kim et al., in the case of a competence-based trust violation, apology was the more successful trust repairing strategy [11]. In the case of a morality-based trust violation,

denial was the more successful trust repairing strategy. This can be explained from research on person perception, it is known that in the morality domain negative information has a higher impact on the overall evaluation of a person than positive information; inversely, in the competence domain positive information has a higher impact on the overall evaluation of a person than negative information [22, 27]. This is due to the diagnosticity of information. In the domain of morality, negative information is more diagnostic. The underlying assumption is that honest people behave honestly all the time, but dishonest people do not behave dishonestly all the time. They might display honest behavior, for instance, to build up a positive reputation in order to milk it later. Honest behavior does therefore not tell too much about the morality of a person; dishonest behavior does. The opposite is true in the case of competence. The underlying assumption is that an inept person can never do something really brilliant, whereas even a very competent person can make a mistake. Consequently, incompetent behavior is less diagnostic for the competence of an interaction partner [11].

In online markets such as eBay, judging morality is more important than judging competence. Packaging and shipping a parcel does not require very sophisticated skills beyond what could be expected from an average person. Consequently, buyers perceive the two types of trust violations differently. A competence-based trust violation should be less detrimental to trustworthiness judgments than a morality-based trust violation because low competence is less diagnostic than low morality. Therefore, the first hypothesis is as follows:

H1: Competence based-trust violations have less negative impact on trustworthiness judgments than morality-based violations of trust.

An apology acknowledges (at least indirectly) the responsibility for an incident. Acknowledging responsibility in case of a competence-based trust violation was not a big issue, because negative information in the competence domain was not very diagnostic. However, in

the domain of a morality-based trust violation, where negative information was diagnostic, acknowledging responsibility would seriously damage perceived morality and consequently also trustworthiness. Therefore, according to Kim et al., denial of the event and in turn denial of responsibility would be the better strategy in this case [11]. Kim et al. found support for their model in a study in which participants were provided with videotapes of alleged job interviews [11]. In a second experiment they showed that this pattern changes if guilt is proven later. In this case, people who had denied their responsibility were judged as less trustworthy than people who had apologized, regardless of type of trust violation. However, an eBay user has to rely on the statements given in the profile; guilt is usually not proven afterwards. Therefore, it is expected that apology and denial should result in different trustworthiness judgments, depending on the type of trust violation:

H2a: In case of a competence-based trust violation, apology results in higher trustworthiness judgments than denial.

H2b: In case of a morality-based trust violation, denial results in higher trustworthiness judgments than apology.

Additionally, dispositional trust was expected to play a role. As mentioned in the introduction, trust is jointly determined by perceived trustworthiness and dispositional trust of the trustor.

H3: The higher dispositional trust, the higher perceived trustworthiness.

Utz tested the effects of apology and denial in a scenario study [31]. Participants received a scenario with a morality-based (sends broken product) or a competence-based trust violation (used wrong Zip code, therefore shipping took quite long). Depending on the experimental condition, the buyer's comment was followed by an apology, denial, or no reaction of the seller. In contrast to the hypotheses, the expected interaction between type of trust violation and type of

reaction was not significant. Instead, two main effects emerged. First, trustworthiness judgments were always higher in the competence-based trust violation scenario than in the morality-based trust violation scenario. Second, trustworthiness judgments were highest in the apology condition, followed by the 'no reaction' condition and the denial condition. The first finding is in line with the expectations of research on person perception [22, 27]. However, there was a limitation in the research design of Utz that made the interpretation of the finding ambiguous [31]. The scenarios differed also in outcomes, a broken product vs. a delayed delivery. The higher trustworthiness judgments in the competence-based trust violation could also be due to the more positive outcome in the delayed delivery condition. To disentangle the two factors, this study used both outcomes and frame them in one scenario in terms of competence and in another scenario in terms of morality.

The second finding, in which an apology was more successful in trust repairing than denial, was not in line with the expectation of Kim et al. [11]. It could be that the model of Kim et al. [11] does not hold true for the parsimonious situation in eBay. Kim et al. used videotapes in the conduction of their study [11]. The alleged job applicants used several sentences to explain their behavior, but nonverbal communication was transmitted as well through the videotape. In eBay, there are only short comments, many of which are often not even whole sentences. This leaves much more room for interpretation. indeed, the standard deviations in the study of Utz [31] were higher than the ones reported by Kim et al. [11]. Moreover, the results showed that especially the denials in the morality-based trust violation scenario were not perceived as believable. If believability was entered as a covariate, the two main effects were no longer significant and the predicted interaction became marginally significant, indicating that believability might play an important mediating role. The following hypothesis is therefore proposed:

H4: The effects of comments and reactions on trustworthiness are mediated by believability.

Pilot Study

Method

First, a pilot study among eBay users was conducted. The goal was to develop and test scenarios that disentangle the type of trust violation and the outcome of the transaction.

Participants and design

The data considered Dutch eBay users and was collected from July to August 2006. An invitation to participate in the survey was sent by email to a random sample of members of a large Dutch commercial 'opt in' access panel. Among these, 1,141 members (response rate 44.3%) who were subscribed to eBay and who bought or sold at least one item in an online auction during the last 12 months participated in the survey. Completion of the study took approximately 20 minutes. The survey included three other experiments that were completely unrelated and did not affect the outcomes of this study. The study had a two by three design relating the type of trust violation (competence vs. morality) and the type of reaction (none vs. apology vs. denial). Furthermore, two different scenarios of varying incident severity, were used as a third factor to increase the generalizability of the results. Severity of the incident was varied within subjects, from which dispositional trust was measured.

Procedure

Participants were confronted with the task to decide whether they would bid for a modern, high quality digital camera during an auction. Each participant was confronted with two scenarios. In the first scenario, the buyer complained about a broken product. In the second scenario, the buyer complained about a delivery delay of four weeks. In each scenario, the participant saw an alleged type of trust violation and under the apology and the denial condition, the reaction of the seller. Every scenario was introduced with the following text: "Suppose that you have decided to buy a

certain digital camera via eBay. The highest bid and thus the selling price will probably be between 175 and 225 Euro. In other words, this is the amount of money that you might lose during the auction if something goes wrong. Suppose that you see the following profile of a seller:" Following this text, the profile of a seller who had conducted 25 transactions within the last 12 months was presented. The seller had received 23 positive and 2 negative ratings, leading to a feedback score of 21. Additionally, the participant saw one negative comment of the buyer. No positive comments were shown. In the no reaction condition, no reaction of the seller was presented, while in the apology condition and the denial condition a corresponding reaction was presented.

Independent variables

Severity of the incident. Two different scenarios were presented. In the broken product scenario, a broken product was delivered, whereas in the delayed delivery the product arrived after four weeks. The second scenario was regarded as less severe because the product finally arrived in good condition. A pretest with a separate sample ($n = 46$) indicated that the broken product scenario was indeed perceived as more severe ($M = 5.02$) than the delayed delivery scenario ($M = 3.5$; answers were given on a 7-point-scale)

Type of trust violation. Type of trust violation was manipulated in a rather subtle manner. For example, in the broken product scenario, the competence-based trust violation was operationalized as (translated from Dutch): *incompetent eBay user, product was damaged (badly packaged)*, whereas the morality-based trust violation was operationalized as *bad eBay user, product was damaged!* The pretest also established that the two types of trust violations were perceived as intended. Participants indicated on a 7-point scale whether the reaction primarily questioned the competence or the morality of the seller (1 = competence, 7 = morality). In case of the broken product scenario, the morality-based trust violation received significantly higher

ratings on this scale ($M = 5.53$) than the competence-based trust violation ($M = 3.73$), $F(1,42) = 7.55, p < .01$. The same pattern occurred for the late delivery scenario ($M_s = 4.46$ and 2.83 , respectively, $F(42) = 7.46, p < .01$)

Type of reaction. The reactions differed per condition and scenario. For example, in the broken product, competence-based trust violation, the denial was *well packaged, not my fault if he lets it fall on the ground!* and the apology was *I'm sorry, my mistake*. Participants of the pretest also answered the question "How would you call this reaction?" on a seven-point scale ranging from 1 = *denial* to 7 = *apology*. All four denials received ratings between $M = 1.27$ and $M = 3.00$, whereas apologies received ratings between $M = 5.30$ and $M = 6.39$, all $F_s > 29.59, p < .001$. The English translation of all scenarios can be found in Appendix A.

Dispositional trust. Dispositional trust was measured by a shortened version of the scale proposed by Jarvenpaa, Knoll, & Leidner [9]. The scale had three items such as "Most people are honest in describing their experiences and abilities." Answers were given on a five-point Likert scale (see Appendix B, $\alpha = .81$).

Dependent variables

Trustworthiness judgments of the seller was measured by the item: "How trustworthy do you think the seller is?" Answers were given on a 15-point Likert scale ranging from "not at all trustworthy" to "very trustworthy". Perceived believability of the answer was measured with the item: "I consider the reaction of the seller as highly believable." Answers were given on a 7-point Likert scale ranging from "do not agree at all" to "fully agree." Single item measures were used for the pilot study because the main goal was to examine whether participants of a field experiment differentiate between the subtle differences between the conditions. Moreover, recent research has established the reliability of single item measures in various domains [33].

Results

Descriptive findings

The average age of the participants was 40 years ($SD=13.5$ years, range 16-82 years). 45.2% of the participants were male, 32% were single, 43% did not have any children, and 35% had an academic education. 53% used the internet for 8 years or longer and 72% were subscribed as an eBay member for at least one year. The participants bought an average of three products during their last 12 months on eBay (range of one to 'more than 100' products). The numbers suggest that we have a heterogeneous population of eBay users who have experience in participating in eBay auctions.

Comparison across scenarios

To test whether severity of the incident indeed affected trustworthiness, the overall levels of perceived trustworthiness were compared across the two scenarios. Only the cells in which no reactions were given are considered for this analysis. Trustworthiness judgments were observed to be higher in the delayed delivery scenario ($M = 10.17$) than in the broken product scenarios ($M = 8.92$), $t(344) = -6.77$ $p < .001$.

Hypotheses testing

The hypotheses focused on the effects of the text comments within a scenario. The data were analyzed with a series of regression analyses to test the mediating effect of believability and to check for possible interactions with the continuous measure of dispositional trust. The categorical variable type of reaction had three levels (apology, denial, none), which required recoding into two contrasts [10, 34]. The first contrast compared apology and denial and was therefore central for the hypotheses tested; according to the rules for orthogonal contrast codes, the second contrast compared the no reaction condition with the two reaction conditions (apology and denial). This contrast tested whether a reaction already had an effect (for example,

because it signals that the seller cares about his or her feedback profile). Dispositional trust was centered, and the interaction terms were constructed by multiplying the respective variables. In contrast to an ANOVA approach, interactions involving the variable 'type of response' are therefore represented by two interaction terms (one for each contrast, see [34]).

Scenario 1: Broken product. When perceived trustworthiness was used as criterion and the contrast codes for the categorical variables as well as all the interaction terms with dispositional trust were entered as predictors, the overall regression model was significant, $F(11,1129) = 5.89, p < .001, R^2_{\text{adj}} = .05$. In contrast to hypothesis 1, the main effect of trust violation was not significant, $t(1129) = 1.02, ns$. The contrast between apology and denial was significant, $\beta = -.21, t(1129) = -7.09, p < .001$, indicating that trustworthiness judgments were higher in the case of an apology ($M = 10.02$) than in the case of denial ($M = 8.12$). The contrast between no reaction and the other two types of reactions was not significant, $\beta = -.03, t < 1, ns$. Additional tests showed that the no reaction condition ($M = 8.95$) was significantly different from both the apology and the denial condition (apology vs. no reaction: $p < .001$; denial vs. no reaction: $p < .05$, Bonferroni-protected comparisons, $p < .01$). Thus, an apology was not only more successful than denial, but indeed repaired trust in comparison with the no reaction baseline condition, whereas denial made things worse. The expected interaction between the type of trust violation and the other factors was not significant, all $ts < 1.62$. Thus, type of reaction had an effect, but this effect was not moderated by type of trust violation. Hypothesis 2a received support, but not hypothesis 2b. Dispositional trust had a significant effect on perceived trustworthiness, $\beta = .07, t(1129) = 2.21, p < .05$. Hypothesis 3 was therefore supported.

To test whether the effects were mediated by perceived believability, it first had to be established that perceived believability, the potential mediator, was affected by type of trust violation [2]. Perceived believability of the seller's reaction could only be measured in conditions

with a reaction, the contrast between no reaction and both types of reaction and the interactions involving this contrast were therefore excluded from this analysis. The regression analysis with perceived believability as criterion was significant, $F(7,739) = 18.72, p < .001, R^2_{\text{adj}} = .14$. Only the contrast between apology and denial was significant, $\beta = -.37, t(739) = -11.00, p < .001$, which indicated that an apology was perceived as more believable ($M = 4.60$) than denial ($M = 3.34$). No other effects were found to be significant, with all t s < 1.57 . When perceived trustworthiness was regressed on type of reaction, type of trust violation, dispositional trust, the interaction terms, and perceived believability, the overall model was significant and explained much more variance, $F(8,738) = 58.22, p < .001, R^2_{\text{adj}} = .38$. The contrast between apology and denial was no longer significant, $\beta = -.03, t < 1$, but believability had a strong effect, $\beta = .61, t(738) = 19.33$. The Sobel test, $z = -9.59, p < .001$, showed that the indirect effect via the mediator was significant, as shown in Figure 1. Hypothesis 4 was therefore supported.

(Figure 1 here)

Scenario 2: Delayed delivery. The same analyses were conducted for the delayed delivery scenario. When perceived trustworthiness was used as dependent variable, the effect of type of trust violation was significant, $\beta = .19, t(1129) = 6.59, p < .001, F(11,1129) = 6.18, p < .001, R^2_{\text{adj}} = .05$. Perceived trustworthiness was higher in case of a competence-based trust violation ($M = 10.79$) than in case of a morality-based trust violation ($M = 9.41$). This was in accordance with hypothesis 1. There was no direct effect of the type of reaction, but an interaction between dispositional trust and the contrast between apology and denial, $\beta = -.07, t(1129) = -2.32, p < .05$. As shown in Figure 2, only high trusters (one standard deviation above the mean) differentiated between the types of reaction. An apology resulted in higher

trustworthiness judgments than denial with the no response condition in the middle. Thus, type of reaction did play a role, but again, not as predicted by Kim et al. [11], and in this scenario only for high trusters. For the high trusters, hypothesis 2a was supported. Dispositional trust had again a significant effect on perceived trustworthiness, $\beta = .09$, $t(1129) = 2.99$, $p < .01$. This result was found to support hypothesis 3.

(Figure 2 here)

To test whether believability of the reaction mediated the effects, it was first tested whether believability was influenced by the interaction between trust and type of reaction. The regression analysis with believability as criterion was significant, $F(7,773) = 16.82$, $p < .001$, $R^2_{\text{adj}} = .12$. There was a significant effect of type of trust violation, $\beta = .32$, $t(773) = 9.60$, $p < .001$, indicating that believability of the reaction was higher in case of the competence-based trust violation ($M = 4.94$) than in case of the morality-based trust violation ($M = 3.86$). The contrast between apology and denial was also significant, $\beta = -.11$, $t(773) = -3.18$, $p < .01$, but this effect was qualified by the interaction with dispositional trust, $\beta = -.09$, $t(773) = -2.64$, $p < .01$. A similar picture as for trustworthiness emerged. Low trusters (-1 SD) did not differentiate between type of reaction, $M_s = 4.22$ and 4.30 for denial and apology, respectively. High trusters ($+1$ SD) perceived the apology as more credible ($M = 4.86$) than denial ($M = 4.22$).

Dispositional trust also exerted a significant effect on perceived believability, $\beta = .09$, $t(773) = 2.57$, $p < .001$. When believability of reaction was entered as a predictor in the regression of perceived trustworthiness, the overall model was significant, $F(8,772) = 90.30$, $p < .001$, $R^2_{\text{adj}} = .48$. Perceived believability exerted a strong effect on perceived trustworthiness, $\beta = .70$, $t(772) = 25.03$, $p < .001$. The interaction between dispositional trust and type of reaction was no longer significant, $\beta = -.02$, $t < 1$, ns, as well as all other effects. The Sobel test showed that the indirect

path via believability of the reaction was significant, $z = -2.63, p < .01$. Hypothesis 4 was therefore supported, as shown in Figure 3.

(Figure 3 here)

Discussion

The pilot test showed that the framing of the incident and the reaction of the seller influenced the trustworthiness judgments made by actual eBay users. However, in contrast to the predictions by Kim et al. [11], the effectiveness of a reaction was not moderated by type of trust violation. For both scenarios, an apology resulted in higher trustworthiness judgments than denial. This was the case for all participants in the broken product scenario, and for the high trusters in the delayed delivery scenario.

A possible explanation for the weaker effect of type of reaction in the delayed delivery scenario could be the type of apology. In the broken product scenario, the apologies were short plain apologies (e.g., "I'm sorry, my mistake"). In the delayed delivery scenario, the apologies offered also an explanation, such as "I had an accident and had to go to the hospital" (see Appendix A). High trusters seemed to be more willing to believe these explanations than low trusters. In order to test this post-hoc explanation, in the main experiment, the effect of plain apologies vs. apologies with an explanation was compared. It was expected that the effect is mainly due to the plain apologies. Otherwise, the same hypotheses were tested:

H1: Competence based-trust violations have less negative impact on trustworthiness judgments than morality-based violations of trust.

H2a: In case of a competence-based trust violation, a plain apology results in higher trustworthiness judgments than denial.

H2b: In case of a morality-based trust violation, denial results in higher trustworthiness judgments than a plain apology.

H3: The higher dispositional trust, the higher perceived trustworthiness.

H4: The effects of comments and reactions on trustworthiness are mediated by believability.

Main Experiment

Method

The main experiment differed from the pilot study in two aspects: First, four types of reactions were distinguished: no reaction, denial, a plain apology, and an apology with an explanation. Second, trust was measured with a scale and not a single item measure.

Participants and design

Dutch eBay users were recruited through an online panel. Four hundred and forty-eight eBay users who had purchased a product within the last 12 months participated in the experiment. The average age was 41 years (SD=12.4 years, range 18-80 years). 44.4% were male, 30.4% were single, 42.2% did not have any children, and 30.4% had an academic education.

The experiment had a two by four design relation the type of trust violation (competence vs. morality) with the type of reaction (none, plain apology, apology with explanation, denial). Again, two scenarios, varying in severity of the incident were used. Type of trust violation and type of reaction were varied between subjects, type of scenario was again a within subject factor. Dispositional trust was measured and not manipulated.

Procedure

The procedure was identical to the procedure of the pilot study.

Independent variables

Severity of the incident and type of trust violation were varied as in the pilot study.

Dispositional trust was measured with the same scale as in the pilot study ($\alpha = .85$).

Type of reaction. The plain apology was always "sorry, my fault" in case of a morality-based trust violation and "sorry, my mistake" in case of the competence-based trust violation. In the broken product scenario, the apology with an explanation in the competence-based trust violation condition was "Sorry, I've packaged and shipped such a camera for the first time and I thought this would be good enough" (translation from Dutch). The apology with an explanation in the morality-based trust violation condition was "Sorry, I was in a hurry and did not really take care". In the delayed delivery scenario, the apologies with explanations were as in the pilot study "Sorry, I interchanged two numbers" and "Sorry, I had an accident and had to go to the hospital".

Dependent variables

Perceived trustworthiness of the seller was measured with nine items which were loosely based on the measure by McKnight, Choudhury, and Kacmar [18], and adapted to the context of eBay auctions. Example items were "I trust that this eBay seller is competent" or "I think this seller wants the best for the buyers." Answers were given on 7-point Likert scales ranging from "do not agree at all" to "fully agree." Cronbachs alpha was .96 for scenario 1 and .98 for scenario 2. To assess the validity of the one-item measure used in the pilot study, perceived trustworthiness was also measured by the one-item measure: "How trustworthy do you think the seller is?" Answers on this questions were again given on a 15-point scale. The trustworthiness scale correlated $r(448) = .72$ with the one-item measure in scenario 1 and at $r(448) = .83$ with the one-item measure in scenario 2.

Results

Comparison across scenarios

Again, trustworthiness judgments were in general higher in case of the less severe delayed delivery scenario ($M = 4.61$) than in the broken product scenario ($M = 4.01$). Means on the trustworthiness scale in the "no reaction" conditions were compared for this analysis, $t(146) = 5.07, p < .001$.

Hypotheses testing

The data were first analyzed with regression analyses. The type of reaction had four levels and, therefore, necessitated being coded into three contrast codes. This resulted in three interaction terms for each interaction involved in the type of reaction. Because the interaction effects with the continuous measure of dispositional trust were not significant this time, it was decided to report the more comprehensive results of an analysis of variance with dispositional trust as categorical variable (low vs. high). Respondents were classified as low ($M = 2.76$) or high trusters ($M = 3.98$) based on a median split.

Scenario 1: Broken product. A two (type of trust violation) by four (type of reaction) by two (dispositional trust) analysis of variance revealed a significant main effect of type of reaction, $F(3,432) = 4.36, p < .01$. The difference between denial ($M = 3.63$) and the plain apology ($M = 4.32$) was significant. However, the effect of the apology with an explanation was weaker ($M = 3.96$) and did not differ significantly from denial and no reaction ($M = 4.01$). Again, the effect was not moderated by type of trust violation, hypothesis 2a was supported, but not hypothesis 2b. There was also a significant main effect of dispositional trust, $F(1,432) = 11.56, p < .01$, which supported hypothesis 3. High trusters experienced a higher level of trust ($M = 4.32$) than low trusters ($M = 3.75$). No other effects were significant, which indicated that there was no support for hypothesis 1 in this scenario.

To test whether the effects were mediated by perceived believability a two (type of trust violation) by three (type of reaction) by two (dispositional trust) analysis of variance with believability as dependent measure was conducted. This analysis revealed a significant main effect of dispositional trust, $F(1,289) = 4.96, p < .05$. High trusters ($M = 4.00$) judged all reactions as more believable than low trusters did ($M = 3.57$). Contrary to expectation, an apology with an explanation turned out to be less believable ($M = 3.83$) than a plain apology ($M = 4.37$). Again, denials were perceived as the least believable ($M = 3.18$), as indicated by the main effect of type of reaction, $F(2,289) = 13.17, p < .001$. These main effects were not qualified by any interactions. If believability was entered as a covariate in the analyses of variance with trustworthiness as dependent measure, believability exerted a strong effect on trustworthiness, $F(1,288) = 413.20, p < .001$. The main effects of type of reaction and dispositional trust were no longer significant, $F_s < 2.26$, which indicated mediation and supported hypothesis 4.

Scenario 2: Delayed delivery. A two (type of trust violation) by four (type of reaction) by two (dispositional trust) analysis of variance revealed a significant main effect of type of trust violation, $F(1,432) = 22.81, p < .001$. The seller was perceived as more trustworthy in case of a competence-based trust violation ($M = 4.70$) than in case of a morality-based trust violation ($M = 4.06$). Hypothesis 1 was supported for scenario 2. The main effect of type of reaction was marginally significant, $F(3,432) = 2.36, p = .07$. Planned contrasts showed that a plain apology ($M = 4.58$) resulted in significantly higher trustworthiness judgments than denial ($M = 4.05$), whereas an apology with an explanation resulted in slightly lower trustworthiness judgments ($M = 4.45$) and differed neither from denial nor the no reaction condition ($M = 4.43$). So, hypothesis 2a was supported, but not hypothesis 2b. In line with hypothesis 3, there was also a main effect of dispositional trust, $F(1,432) = 11.53, p < .01$. High trusters ($M = 4.61$) perceived the seller as

more trustworthy than low trusters did ($M = 4.15$), which supports hypothesis 3. No interaction effects were observed to be significant.

The same pattern was found for believability of the reaction. The main effect of type of trust violation, $F(1,262) = 22.69$, $p < .001$, showed that the reactions to the competence-based trust violation ($M = 4.86$) were perceived as more believable than the reactions to the morality-based trust violation ($M = 3.89$). Moreover, the main effect of type of reaction, $F(2, 262) = 5.41$, $p < .01$, showed that a plain apology ($M = 4.72$) was perceived as most believable, followed by the apology with an explanation ($M = 4.50$). Denial ($M = 3.91$) was perceived significantly less believable than the apologies. The main effect of dispositional trust, $F(1,262) = 6.53$, indicated that high trusters ($M = 4.64$) found all reactions more believable than low trusters ($M = 4.11$). If believability was entered as a covariate in the variance analyses with perceived trustworthiness as dependent measure, it had again a strong effect, $F(1,261) = 766.80$, $p < .001$. The main effects of dispositional trust, type of reaction and type of trust violation were no longer significant, all $F_s < 2.84$. Thus, hypothesis 4 was supported as well.

General Discussion

Across the pilot study and the main experiment, it was found that short text comments given in reputation systems influence trustworthiness judgments. An overview of this can be seen in Table 1. The severity of the incident and, in the delayed delivery scenario, also the framing of the trust violation as competence-based or morality-based had an effect on trustworthiness judgments. A morality-based trust violation decreased trustworthiness more than a competence-based trust violation. More important, the reaction of the seller influenced the trustworthiness judgments. However, in contrast to the predictions by Kim et al. [11], the effectiveness of a reaction was not moderated by type of trust violation. Independent of type of trust violation, plain apologies resulted in higher trustworthiness judgments than denials, whereas apologies

with an explanation were less successful than plain apologies in repairing trust. These effects were mediated by perceived believability of the reactions.

(Table 1 here)

To our knowledge, this is the first paper which directly and systematically studies the effects of text comments and the reactions of sellers on trustworthiness. Some researchers have previously analyzed the comments on eBay and classified them in different categories, [8] but did not assess trustworthiness judgments or proxies for behavioral trust such as probability of sale. Pavlou and Dimoka examined the relationship between comments and price premiums, but focused only on extraordinary comments [20]. They sent questionnaires to the winning buyers. Winning buyers are people who already have shown behavioral trust; and they already have interacted with the seller. Thus, their trustworthiness judgments were influenced by actual experiences with the seller. The present research examined how buyers form trustworthiness judgments before they decide whether they want to place a bid on this seller, based only on the information given in the feedback profile and the text comments, but not on the actual interaction with the seller.

The effects in the current studies were (when believability was omitted) smaller than the ones reported by Pavlou and Dimoka [20]. However, only the type of trust violation and the type of reaction were entered in the current analyses. The current studies also did not aggregate across a large amount of extraordinary comments. Instead, they used rather subtle manipulations, such as the difference between "bad eBayer" and "incompetent eBayer." That these subtle changes have effects served to indicate that eBay users carefully process the information given in a short text comment.

The results differed slightly across scenarios, as shown in Table 1. In the broken product scenario, the type of trust violation had no effect, whereas it mattered in the delayed delivery

scenario. The delayed delivery scenario is the less severe scenario. Eventually, the buyer received the desired product in good quality. In this case, it makes a difference whether the incident is construed in terms of a competence-based or a morality-based trust violation. Using the wrong zip code was forgiven by the potential buyers. This was in line with the findings on the positive-negative asymmetry in impression formation [22, 27]: interchanging two numbers was not really diagnostic for low competence, therefore, trust levels remained relatively high. However, if the incident was seen as an indicator of low morality of the seller, the incident was more diagnostic and trustworthiness judgments were observed to decrease. In the case of the more severe broken product scenario, the situation was different. Trust levels were generally lower and buyers were more cautious, even when the trust violation was competence-based. The influence of type of trust violation was therefore smaller.

Interestingly, plain apologies were always more successful in rebuilding trust than denials, regardless of the type of trust violation. This was in contrast with the predictions of Kim et al. [11]. The pretest showed that individuals correctly perceived the type of trust violation, and not the case that the manipulation was too subtle. One explanation would be that the model of Kim et al. [11] does not hold for restricted and relatively abstract situations such as the short feedback comments in eBay. However, this argument is not very convincing. A better explanation might be that the participants behaved like the participants in the second experiment of Kim et al. in which guilt was actually proven [11]. Research indicates that members of eBay, when compared to members of some other online communities, show relatively low levels of trust [16]. Moreover, as the measures of believability of the reactions showed, the participants did not perceive the denials as believable. Obviously, they treated the denying eBay sellers as persons whose guilt was already proven. Consequently, denial could not repair trust.

Perceived believability of the reactions mediated the results, and entering believability into the analyses explained also more variance. Believability of a reaction turned out to be a strong predictor of trustworthiness: the more believable a reaction, the higher trustworthiness. The believability ratings showed relatively high standard deviations (between 1.46 and 1.82), which indicate that there was much more ambiguity and more room for interpretation in short eBay feedback comments than in lengthy explanations used in prior research on trust reparation [11, 18, 25]. In these studies, trust repairing strategies were often directed to the person who experienced the trust violation. On eBay, it was more important to regain the trust of potential future interaction partners because a second transaction with the same buyer was unlikely [24]. In these situations, in which the potential buyer has to rely on brief descriptions of the incident, as well as on short trust repairing attempts, believability of the comments played a much more important role. Future research on text comments in reputation systems should therefore include measures of perceived believability.

Limitations and future research

It was briefly commented on that there are some limitations to this study, which should be addressed in future research. First of all, only two scenarios were presented. The same feedback profile was displayed in both scenarios in order to disentangle effects of the numerical indicators and the text comments. Future research might also vary the overall feedback profiles. If the feedback profile contains a high absolute and relative number of negative feedback, it probably does not make much difference what type of trust violation or reaction occurred. Also, if a power seller who receives hundreds of feedback ratings every week has a small amount of negative feedback, the comments was probably of less importance because it was clear that noise (such as delayed delivery) occurred in a certain percentage of transactions. It can be expected that the

effect of comments would be strongest in case of non-professional sellers with a moderate amount of transactions.

Only the negative comment was displayed, whereas eBay also presents all positive comments. Thus, the salience of the negative comment was enhanced. However, this was the case across all conditions and should therefore not affect the differences between conditions. The present research used two scenarios which differed in severity of the incident. Future research could include other types of outcomes, such as misrepresentation of the product or black market goods (see Gregg and Scott [8] for a complaint classification schema).

The present research did not measure actual levels of behavioral trust. However, it used active eBay users as participants and not university students. It was also not possible to see the names of all eBayers who have viewed a certain feedback profile. Even if invitations to participate in a survey were sent to all bidders, this sample would include only people who already have expressed behavioral trust and would exclude eBayers who have decided not to place a bid. Therefore, the methods used in study were a compromise between experimental control and ecological validity.

Practical implications

This study also has practical implications. Online markets are noisy environments. Things go wrong and it would be detrimental if buyers with negative experiences generalize their distrust to the whole community [21]. The present study shows that reparation of trust is possible and that not all trust repairing strategies are of equal value. A practical implication for sellers is that it is better to acknowledge the incident and react with an apology than to deny it (perhaps even in cases where denial would strictly speaking be telling the truth). Moreover, a plain apology ("Sorry, my fault") is more successful than an apology that offers an explanation. A plain apology is a clear sign of regret, whereas explanations are not believed by every buyer.

The results have also implications for the operators of online market places. Although it has repeatedly been shown that numerical feedback systems build trust, it is also important to offer the possibility to add text comments. Without the text comments, it is difficult for sellers to rebuild trust. Despite their shortness, the text comments provide information about the type of trust violation which influences trustworthiness judgments and trusting intentions.

Conclusion

The present research was the first that examined buyers' text comments *and* sellers' reactions on the comments in online reputation systems. It focused on trust *rebuilding* strategies in eBay. Prior research has focused on the trust building function of reputation systems or the detrimental effects of negative experiences [20, 21]. Online markets are noisy environments. Mails and parcels get lost, people get sick, and misunderstandings occur. It is therefore important to be able to repair trust after negative feedback. The experiments found that the short comments are used to construe the situation in terms of competence-based or morality-based trust violations and that, depending on the severity of the incident, the latter was sometimes more trust decreasing than the former. Moreover, the reparation of trust is possible. Apologies turned out to be more successful in rebuilding trust than denials independent of the type of trust violation. This can be explained by the fact that denials were not perceived as believable in this context due to the presupposition of guilt. Nevertheless, the present experiments showed that even short apologies in a feedback system can affect the rebuilding of trust. Although there were still many open questions, the present research was a promising first step in studying trust rebuilding processes in online markets.

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Appendix A

Experimental Manipulations in the Pilot Study

The English translation of the introduction of the scenario is as follows. "Suppose that you have decided to buy a certain digital camera via eBay. The highest bid and thus the selling price usually is between 175 and 225 Euros. In other words, this is the amount of money that you might lose if something goes wrong during the transaction."

Following the feedback profile of the seller the participant was confronted for each scenario with one of the six combinations of buyer-seller comments and reactions.

Scenario 1: Broken product

Buyer comment under condition 'competence-based trust violation': *incompetent eBayer, product was damaged (badly packaged)*

seller reaction 'denial': *Was well packaged, not my fault if he lets it fall on the ground!*

seller reaction 'apology': *I'm sorry, my mistake.*

no seller reaction: -

Buyer comment under condition 'morality-based trust violation':

bad eBayer, product was damaged!

seller reaction 'denial': *worked well when I sent it, not my fault if he is unable to install it!*

seller reaction 'apology': *I'm sorry, my fault.*

no seller reaction: -

Scenario 2: Delayed delivery

Buyer comment under condition 'competence-based trust violation':

wrong postal code, took therefore 4 weeks until I received product!

seller reaction 'denial': *buyer gave me wrong postal code, package came back!*

seller reaction 'apology': *I'm sorry, I interchanged two number.*

no seller reaction: -

Buyer comment under condition 'morality-based trust violation':

bad eBayer, took 4 weeks before I received the product!

seller reaction 'denial': *I sent it on time, don't know what happened with the mail
delivery!*

seller reaction 'apology': *I'm sorry, I had an accident and had to go to the hospital.*

no seller reaction: -

Appendix B

Trusting disposition

Most people are honest in describing their experiences and abilities. (5 point Likert scale)

Most people answer personal questions honestly. (5 point Likert scale)

Most people will do what they tell they are going to do. (5 point Likert scale)

Scale of trustworthiness

This eBay seller is competent. (7 point Likert scale)

In case of problems with the service, I trust that the seller will be able to fix them. (7 point Likert scale)

I believe that the seller knows what one has to take care of during eBay transactions. (7 point Likert scale)

I trust that this eBay seller is professional. (7 point Likert scale)

In case of problems with the service, I trust that the seller will give an effort to solve them quickly. (7 point Likert scale)

I believe that this seller keeps his word. (7 point Likert scale)

I believe that this seller wants the best for his buyers. (7 point Likert scale)

In case of problems with the product, I trust that the seller will do his best to solve them. (7 point Likert scale)

I believe that this seller acts honestly. (7 point Likert scale)

Table 1. Overview of the Hypotheses and Results

| Hypothesis | evidence | | | |
|--|----------------------------|------|-------------------------------------|-----|
| | Scenario 1: broken product | | Scenario 2: delayed delivery | |
| | Pilot | Exp. | Pilot (apology with explanation) | Exp |
| H1: type of trust violation: C > M | no | no | yes | yes |
| H2a: competence-based violation: (plain) apology > denial | yes | yes | for high trusters | yes |
| H2b: morality-based violation: denial > apology | no | no | no | no |
| H3: dispositional trust | yes | yes | yes | yes |
| H4: mediation by believability | yes | yes | yes | yes |

Figure Captions

Figure 1. Mediating Effect of Believability (Broken Product Scenario, Pilot study)

Figure 2. Perceived Trustworthiness as a Function of Dispositional Trust and Type of Reaction (Delayed Delivery Scenario, Pilot study)

Figure 3. Mediating Effect of Believability (Delayed Delivery Scenario, Pilot study)

Figure 1

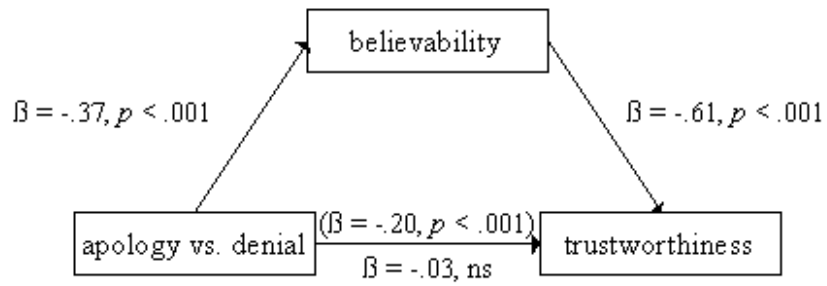


Figure 2

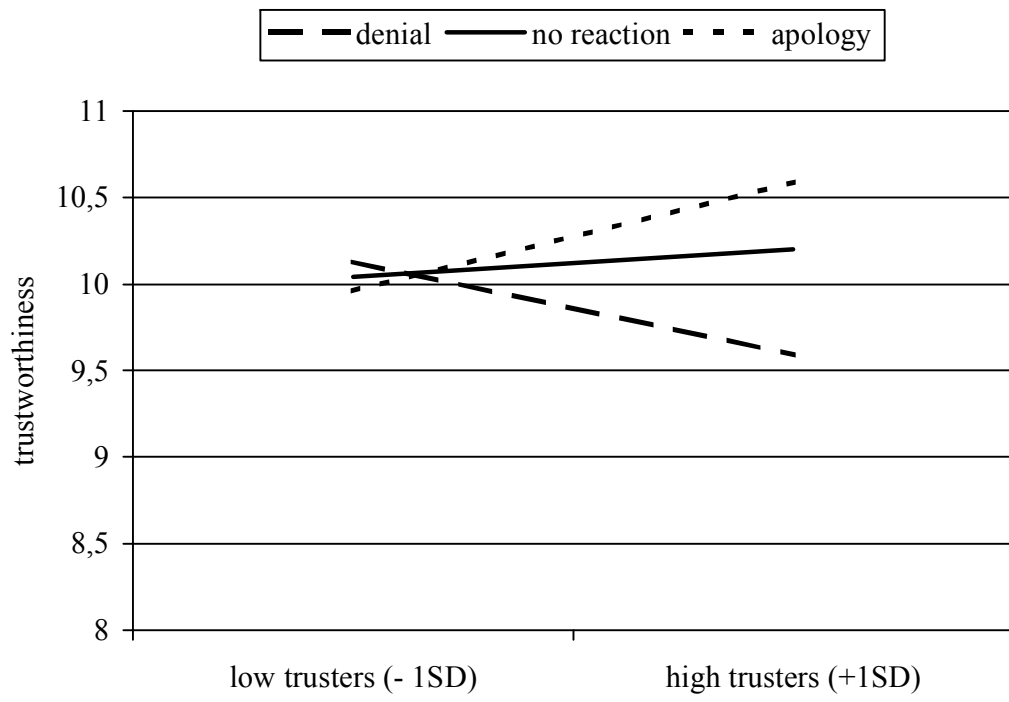


Figure 3

