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INFORMATION FAILURES, TRUST VIOLATION, AND CUSTOMER FEEDBACK IN WEB-ENABLED TRANSACTIONS: THE ROLE OF CAUSAL TRANSPARENCY AS A TRUST REPAIR MECHANISM

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INFORMATION FAILURES, TRUST VIOLATION, AND CUSTOMER FEEDBACK IN WEB-ENABLED TRANSACTIONS: THE ROLE OF CAUSAL TRANSPARENCY AS A TRUST REPAIR MECHANISM

Research paper

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Abstract

Information asymmetry and fear of opportunism turn e-commerce information failures into a threat for e-vendors' trustworthiness. Consumers that perceive an e-vendor as dishonest and unreliable, in turn, form intentions to notify others through spreading of negative electronic word-of-mouth (eWOM). While information systems (IS) researchers agree on the relevance of trust for e-commerce interactions, little effort has been taken to understand how IS design should respond to information failures to defend e-vendors' trustworthiness. The purpose of the present paper is to contribute to trust violation and repair research in web-enabled buyer-seller interactions. By building upon trust research and related theories an explanatory model for the relationship between information failures, trustworthiness and negative eWOM is derived. A special focus is given to the distinct role of each subdimension of trustworthiness (integrity, benevolence, competence). Finally, design interventions that defend e-vendors' trustworthiness are derived. Results of an experiment support the research model.

Keywords: information failure, trust violation, trust repair, electronic word-of-mouth.

1 Introduction

Online marketplaces find themselves in a highly competitive environment. Moreover, the impersonal and anonymous nature of web-enabled transactions allows for perceptions of uncertainty, information asymmetry and opportunism which can hinder consumers' in making confident purchase decisions (Pavlou and Dimoka, 2006; Bhattacherjee, 2002). In order to overcome these informational challenges of web-enabled transactions, e-vendors are expected to respond to consumers' information needs by providing signals that bridge the gap of hidden information and hidden action (Wells et al., 2011). Such informational interventions are especially relevant to built and enhance consumer's trust in an e-vendor (Pavlou et al., 2007). Trust has been generally recognized as a central constituent of successful online B2C relationships (Gefen et al., 2003; McKnight et al., 2002; Wang and Benbasat, 2008). According to Cheung and Lee (2006), e-vendors' trustworthiness is pivotal for online B2C relationships.

This trust relationship can be damaged when consumers experience e-service failures in web-enabled transactions. Following Grönroos et al. (2000), an e-service comprises the process of offering and selling physical goods and services over the internet. A successful e-service, accordingly, enables a customer to get relevant information, to operate the system, and to finally order and pay for the desired product. In this perspective e-service failures "occur whenever the e-commerce website is incapable of offering the necessary technological capabilities essential for a consumer to accomplish his/her transactional activities and/or objectives." (Tan et al. 2016, p. 3). E-service failures, as assessed in the pre-

sent paper, have to be clearly differentiated from intended forms of manipulation or deception (e.g. manipulated product information, biased recommendations, distraction strategies) by e-vendors as examined by Xiao and Benbasat (2011). In contrast to these, it is important to highlight the notion of *unintentionality* when talking about e-service failures. Despite the fact that e-service failures are unintended by e-vendors, such negative events still leave room for interpretation about the potential failure cause. There are two reasons to belief that e-vendors' trustworthiness is threatened by the occurrence of such failures: first, due to the opportunist potential inherent to e-commerce settings, there is the risk that consumers conclude that a service failure represents a deliberated act from the e-vendor to manipulate consumers' behavior in his own self-interest (Xiao and Benbasat, 2011). Second, the correspondence bias of causal attribution processes (Gilbert and Malone 1995) reveals that people rather make a person's internal motives and dispositions responsible for a negative event than external situational factors. Such an attribution in the context of a service failure damages a e-vendor's trustworthiness, even when he had no deceptive intention. We therefore posit that the active reconciliation of an e-vendors' trustworthiness is needed in the context of e-service failures in order to prevent detrimental consequences such as negative electronic word-of-mouth (eWOM).

Among information systems (IS) researchers, a general consent exists about the relevance of trust for e-commerce interactions. At the same time, little attention has been given to the role of trust violations and design strategies for preventing such trust damages in the online B2C environment. In the marketing and management literature, the effects of services failures on consumers' purchase behavior have been discussed and studied expansively (Smith et al., 1999; Boshoff and Leong, 1998). However, IS studies on service failures in web-enabled transactions and their consequences on consumers' trust are still rare. Holloway and Beatty (2003) contributed to this area by providing an initial typology of e-service failures and a preliminary discussion of potential negative consequences for consumers' trust. Similarly, Tan et al. (2016) developed a comprehensive classification of online service failures and, additionally, revealed how they relate to disconfirmed consumer expectations. Moody et al. (2014) focused on the effect of situational abnormalities (i.e. service failures) on consumers' intention to trust and to interact with an e-vendor. They found that such abnormalities negatively relate to perceptions of e-vendors' trustworthiness. Similar consequences of trust violations have been reported by Rao and Lee (2007). Choi and Nazareth (2005) outlined a model of e-commerce trust repair that proposes apologies, explanations and compensations as effective reconciliation strategies in online buyer-seller interactions. Subsequently, Chen et al. (2013) empirically validated the positive effect of these reconciliation strategies on consumers' intention to trust an e-vendor. The mentioned studies looked at the role of general trust, disregarding the individual dimensions of trustworthiness and their distinct role in the context of e-service failures. A limited number of studies on trust development in e-commerce – rather than trust violation and defense – recognized this multi-dimensionality of trust. Wang and Benbasat (2007), for example, revealed that different types of explanations about a recommendation agents' decisions satisfy distinct trust dimensions – competence, benevolence and integrity – separately. Moreover, social presence (Gefen and Straub, 2004) and textual feedback (Pavlou and Dimoka, 2006) have been identified as beneficial for benevolence-based trustworthiness. Extant research, thus, indicates a lack in recognizing the effects of e-service failures on the distinct subdimensions of trust. Furthermore, a literature review reveals a shortcoming of research considering distinct e-service failure types. For example, Chen et al. (2013) as well as Choi and Nazareth (2014) examined unfavorable events in e-commerce without specifying the nature of these events. Other studies differentiated between causes of failures but did not relate them to the e-service specific issues (e.g. delivery delay, wrong product delivery) (Pavlou and Gefen, 2005; Rao and Lee 2007). In contrast, the experimental study on trust in e-commerce by Moody et al. (2014) considered different types of e-service failures (information, process and design), but did not consider how these relate to different trust dimensions or how trust repair interventions can influence these perceptions.

In sum, while IS research has recognized the negative influence of e-service failures on vendors' trustworthiness, the current literature does not provide a clear understanding of how different types of

e-service failures relate to damages of the distinct subdimensions of e-vendors' trustworthiness and on the outcome variables of negative eWOM. Our research seeks to fill this gap by analyzing the trust damaging effects of unintended information failures and the need to respond to such events. Because information manipulation is the prevalent form of online deception (Xiao and Benbasat, 2011), we posit that information failures – a type of e-service failures caused by "inaccurate, incomplete, irrelevant, and/or untimely transactional information" (Tan *et al.*, 2016) – are most dangerously interpreted as opportunistic e-vendor behavior. Therefore, we focus on the trust damaging effect of information failures. This e-service failure type, moreover, contrasts the increased informational expectations of online consumers. The advent of business intelligence and analytics has not only transformed the digitalization strategies in the B2C-market but has also raised customer expectation of being timely and accurately informed throughout the whole purchasing process (H. Chen et al., 2012; Granados and Gupta, 2013). In this environment, the key challenge lies in the synchronization of orders and inventories to avoid information failures that result from sudden unexpected changes in prices, availabilities or qualities (Rigby, 2011). For examples, users of online hotel booking platforms expect to always be provided with the latest information about room availabilities and prices. This requires consistent real-time synchronization between the booking systems of platforms and hotels. Yet, technological capabilities of synchronization still need to become more robust and stabile in order to extinguish errors and inconsistencies that lead to information failures in online interactions (Lucas et al., 2013). When unintended information failures are interpreted as forms of dishonest, selfish or unreliable behavior, they damage an e-vendors' trustworthiness (Mayer et al., 1995). Consequently, it is especially important to reveal how IS designers can defend such violations by making use of adequate interventions.

The purpose of the present paper is to contribute to trust violation and repair research in web-enabled buyer-seller interactions by addressing the following research questions:

1. How do e-service information failures relate to damages of an e-vendors' trustworthiness and consumers' intention to engage in negative eWOM?

2. Can informational design interventions defend an e-vendors' trustworthiness in the context of a service information failure?

In order to address the formulated research questions, we are adopting the multi-dimensional perspective to examine trust and trust repair proposed by Tomlinson and Mayer (2009) in their *causal attribution model of trust repair*. This allows us to analyze the effects of information failures on each of the three recognized trustworthiness dimensions – competence, benevolence and integrity. By doing so, we seek to identify effective design interventions to defend trust damages. We are examining these information failures by considering the impact of asymmetric information in web-enabled transactions to reveal the opportunistic potential inherent to e-commerce that allow for attributing an unintended failure as a deliberated act from an e-vendor (Akerlof, 1970; Spence, 1973). Causal attribution theory Jones and Davis (1965) provides the required psychological framework to identify how online consumers interpret such negative events as a goodwill-based trust violation instigated by the e-vendor. Insights from literature on information signaling and trust formation are used to develop design interventions that allow to prevent trust damages. The defensive effect of the deduced intervention is tested in an online experiment.

2 Theoretical Background

2.1 Trust and trustworthiness

Trust is a fundamental component of social exchange relationships characterized by uncertainty, vulnerability and dependability (Rousseau et al., 1998). *Individual trust* is defined as "a psychological state comprising the intention to accept vulnerability based upon positive expectations of the inten-

tions or behavior of another" (Rousseau et al., 1998). *Trusting beliefs* determine the level of initial trust. This perceptual construct is also denoted as the trustee's *trustworthiness,* because it refers to the evaluation of characteristics internal to the other party that influence the formation of trusting intentions (Tomlinson and Mayer, 2009). Three conceptually distinct dimensions – competence, benevolence and integrity – have been acknowledged as the most prevalent and relevant for the formation of trustworthiness (Mayer et al., 1995). *Competence* reflects a trustor's perception of a trustee's domain-specific knowledge and ability to successfully produce the desired outcome (Mayer et al., 1995). The *benevolence* dimension of trustworthiness, instead, reflects the extent to which the trustee is perceived to be motivated to always put the interest of the trustee first (Bhattacherjee, 2002). *Integrity,* finally*,* represents the more ethical dimension of trustworthiness. It reflects the extent to which the trustee is perceived to adhere to generally accepted principles and to be honest (Mayer et al., 1995). In the present paper, we further distinguish between qualification- and goodwill-based trustworthiness. The dimension of competence is classified as qualification-based trustworthiness as it focuses on a trustee's characteristics that qualify him to fulfill the expectations of the trustor. The dimensions of benevolence and integrity, in contrast, are classified as goodwill-based trustworthiness as these consider a trustee's intentions to fulfill the expectations of the trustor.

2.2 Trust violation and repair

Trust is not a static construct but evolves over time. During the first interaction with a formerly unknown party trustors accumulate information to assess the others' trustworthiness. The present study focuses on this form of trust named *initial trust* (McKnight et al., 1998). In the early stage of a relationship, behavioral consistency is a key element for the establishment of trust (Lewicki and Bunker, 2016). Trust can be strengthened through positive experiences and the accumulation of more information about the trustee, negative experiences can harm trust at any phase of a relationship (Tomlinson and Mayer, 2009; Rousseau et al., 1998). In the context of the present paper, especially the role of trust violating events has to be considered. *Trust violations* occur when an action disconfirms the positive trusting beliefs a trustor holds about a trustee (Tomlinson et al., 2004). This is reflected in the definition of trust violations as "unmet expectations about another's behavior, or when that [other party] does not act consistent […]" (Bies and Tripp, 1996). Besides the immediate negative effect for the trustor, such violations have the potential to harm the relational basis permanently. Trust reconciliation efforts initiated by the trustee can defend such damages (Lewicki and Bunker, 2016). Empirical studies found positive trust repairing effects of communicative reconciliation strategies such as apologies, promises or explanations (e.g. Kim et al., 2004; Schweitzer et al., 2006; Xie and Peng, 2009; Tomlinson and Mayer, 2009; Kim et al., 2009).

2.3 Information failure and perceived vendor benefit

By providing inaccurate, inconsistent or untimely decision relevant information, information failures can create the impression that the e-vendor attempts to opportunistically benefit from this event. Benefit in this context refers to speculations about vendors' hidden interests that can cause disadvantages for the consumer. According to Xiao and Benbasat (2011), the manipulation of information is the main form of deceptive practices in e-commerce. Based on this perspective, we assume that information failures regarding decision relevant information manifest in users' perceptions of potential vendor benefit. Examples for such benefits are higher margins, better commissions, optimized stocks or cross-selling. The magnitude of the perceived benefit can change depending on the type and severeness of an information failure (Smith et al., 1999). For example, an untimely price increase represents an apparent form of potential e-vendor benefit and becomes more severe as the deviation of the original price increases. In contrast, an untimely price decrease represents a less evident form of potential benefit. However, such an information failure may be perceived as an act to achieve sales under wrong suppositions and cause doubts about product quality.

2.4   Opportunism and causal transparency

„Opportunism is an effort to realize individual gain through a lack of candor or honesty in transactions" (Williamson, 1975). In the context of e-commerce transactions, every encounter that creates perceptions of vendor benefits on the cost of a consumer's interest can lead to impressions about opportunist intentions. In marketing research, perceptions of opportunism have been found to be negatively associated with consumers' loyalty behavior (Chiou and Shen, 2006) as well as with consumers' trust into a vendor (Morgan and Hunt 1994). The creation of transparency through disclosure of hidden information is an acknowledged practice to reduce perceived opportunism. Causal transparency, in the present context, refers to the provision of accurate information about system inherent and situational factors to increase the understanding about the cause of an information failure (Seong and Bisantz, 2008). In service marketing research, it has been shown that the retrospective provision of causal information that explains why a service failure occurred and why it could not be prevented is an effective relationship management strategy (Greenberg 1996; Gelbrich 2009). Similarly, an experimental study conducted by Mattila 2006 indicates that causal transparency after a service failure mitigates negative consumer perceptions. These studies are in line with trust theories that posit causal explanations as a central trust repair strategy (Tomlinson and Mayer, 2009).

2.5   Negative eWOM

Electronic word-of-mouth refers to non-commercial communication of opinions in a variety of online channels such as social networks (e.g. Facebook), e-commerce platforms (e.g. Amazon) or review websites (e.g. Tripadvisor) (Cheung and Lee, 2012). Extant research on service failures in marketing acknowledges negative WOM as one major consequence of negative service encounters that should be considered in relationship reconciliation activities (Singh 1990, Gelbrich 2009). For e-commerce relationships the role of negative eWOM is especially interesting as it has a stronger effect on consumer decision making than positive eWOM (Goles et al., 2009). Accordingly, consumers that spread negative eWOM in their social networks pose a serious risk for e-vendors. Therefore, in the present study we measure the success of trust reconciliation with the dependent variable *negative eWOM* in online social networks.

3   Theory development

In the present article, we seek to reveal how information failures represent a meaningful threat to e-vendors' trustworthiness and how this can be defended by the use of informational design interventions. In constructing our research model, we follow the *causal attribution model of trust repair* by Tomlinson and Mayer (2009). This model differentiates between the initial assessment of the negative event, the triggered cognitive processes (perceived opportunism) that influence the trust evaluation (trustworthiness) and finally relates to future trusting behavior (negative eWOM). This model is especially adequate as it incorporates the role of responses to a trust violation (causal transparency). We identify that the loss or disadvantage caused by information failures relate to perceptions of opportunistic e-vendor behavior. This damages an e-vendor's trustworthiness and stimulates users' intentions to spread negative eWOM. Furthermore, we identify that informational signals can increase the causal transparency and thereby act as effective repair strategies for e-vendors' trustworthiness in the context of information failures. Lower perceptions of opportunism relate to higher goodwill-based trustworthiness, and ultimately are beneficial for consumers' trusting intentions. Our research model is depicted in figure 1.
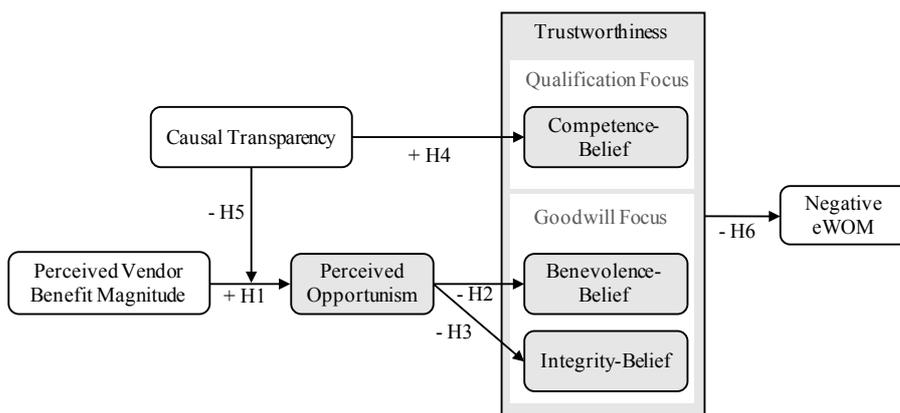
Figure 1.   Research model

Considering the impact of asymmetric information (Akerlof, 1970) on the relationship between online consumers and e-vendors allows revealing the opportunistic potential inherent to e-commerce transactions. The relationship between the consumer and the e-vendor is characterized by asymmetric information and conflicting goals as both parties seek to fulfill their own self-interest (Pavlou et al., 2007). In a B2C e-commerce scenario, the consumer seeks to get a product at the lowest possible price from an e-vendor who seeks to maximize his own profit. Information asymmetry in this context implies that the e-vendor possesses more information about the product (i.e. quality and quantity) which he can use to engage in opportunistic behaviors (Singh and Sirdeshmukh, 2000). In this transactional perspective, opportunism refers to self-interest fulfillment through dishonesty and guile (Williamson, 1975). If consumers are confronted with an information failure – that is they identify that information given by the e-vendor is inaccurate, incomplete, irrelevant or untimely – they will cognitively evaluate the potential cause of that error. Attribution theory provides a psychological framework to analyze this evaluation process. According to that theory, two central causal attributions can be made after a negative event occurred to identify who or what is responsible and blameworthy (Tomlinson and Mayer, 2009). First, the attribution that the event results from intentional behavior caused deliberately by an actor (Jones and Davis, 1965). Second, the attribution that the event results from accidental behavior caused by uncontrollable situational factors (Jones and Davis, 1965). While e-service failures by definition are caused by unintended situational and technical factors, the underlying causes are not assessable for the consumers. Instead, the existing information asymmetry and goal incongruence add to perceptions of intended opportunism when an information failure occurs (Chiou and Shen, 2006). This observation is in line with the correspondence bias of attributional processes, which represents humans' "tendency to draw inferences about a person's unique and enduring dispositions from behaviors that can be entirely explained by the situations in which they occur." (Gilbert and Malone, 1995). Due to the correspondence bias, consumers that experience an informational failure are likely to attribute the failure to the e-vendors' perceived opportunistic intentions rather than to situational forces. This is deemed even more relevant because information manipulation is associated with deceptive e-commerce practices (Xiao and Benbasat, 2011) and users do not have the information required to differentiate between an intended deceptive act and an unintended failure. Therefore, failures distorting decision relevant information manifest in users' perceptions of vendor benefit that stimulate perceptions of opportunism. This effect becomes stronger if the perceived vendor benefit increases (e.g. higher margin, crossselling, selling of lower quality), as such situations make the interaction with the e-vendor less equitable (Smith et al., 1999). Therefore, we hypothesize:

H1: The higher the perceived vendor benefit magnitude, the higher the perceived opportunism.

The negative relationship between perceived opportunistic behavior and trust has been widely discussed by transactional economists (Jensen and Meckling, 1976). Furthermore, studies of online buy-

er-seller interactions have confirmed the relationship-damaging power of opportunism (Jones and Leonard, 2014; Pavlou et al., 2007; Chiou and Shen, 2006). A more nuanced analysis of the effect of perceived opportunism can be conducted when applying a multi-dimensional perspective on trust by considering the three dimensions of trustworthiness (Mayer et al., 1995). Information failures that trigger perceived vendor opportunism are related to damages of vendors' integrity and benevolence rather than competence. While perceived integrity- and benevolence-violations represent an intended abandonment of the goodwill-focused trustworthiness, perceived competence-damages represent an unintended disconfirmation of the qualification-focused trustworthiness. From users' perspective the cause of an information failure is not apparent and adds to users attribution of intended opportunistic vendor behavior rather than an unintended incident. As defined by Williamson (1975), opportunism is a form of intentional dishonest behavior to pursuit a self-interested objective. An information failure that leads to perceptions of opportunism implies that the vendor is dishonest (e.g. purposely provision of inaccurate information) and does not put the interest of the consumer first (e.g. distortion of decision relevant information). Keeping one's promises and behaving in a consistent way are central constituents of integrity (Lewicki and Bunker, 2016; Erhard and Jensen, 2012). Accordingly, acting dishonest and unreliable strongly relates to damages of the trustworthiness dimension of integrity (Mayer et al., 1995). Not being concerned about the consumer's interests and fears strongly relates to damages of the trustworthiness dimension of benevolence (Mayer et al., 1995). We hypothesize:

H2: The higher the perceived opportunism, the lower the trusting belief into the vendor's integrity.

H3: The higher the perceived opportunism, the lower the trusting belief into the vendor's benevolence.

Text-based intelligent explanation facilities – informational design interventions that explain the reason for an information failure – increase the causal transparency by revealing the true cause of the failure to a consumer (Gregor and Benbasat, 1999). Studies on trust in human-computer interactions repeatedly found that providing meaningful information or explanations about why a certain event happened demonstrates competence (Wang and Benbasat, 2007; Komiak et al., 2004). The provision of explanation facilities in the occurrence of an information failure influences perceptions of vendor competence for two reasons. First, being able to respond to information failures in a timely manner requires abilities to detect and understand inconsistency in the online shopping process. Second, the effective communication of the underlying technical reasons of an information failure to a consumer requires expertise and domain-specific knowledge. The resultant level of perceived competence represents one dimension of e-vendor's trustworthiness (Mayer et al., 1995). We hypothesize:

H4: The higher the causal transparency, the higher the trusting belief into the vendor's competence.

The information asymmetry between two parties can be mitigated by the provision of signals – disclosed information about the true quality of the other party (Spence, 1973). In online-shopping situations information signals provided by the e-vendor help consumers in their assessment of the seller and the offered products, and thus ease the decision making process (Dimoka et al., 2011). Importantly, effective signals need to be clearly visible, unambiguous and convincing (Singh and Sirdeshmukh, 2000). Dimoka et al. (2012) demonstrate that provision of useful textual information are effective signals in e-commerce interactions. Similarly, text-based intelligent explanation facilities that increase the causal transparency are deemed effective design interventions to bridge the gap of information asymmetry in the context of e-service failures. By providing transparency about the cause of the information failure, these design interventions affect the attributional evaluation. More precisely, causal transparency counteracts the correspondence bias which leads consumers to attribute a service failure to opportunistic intentions rather than to technical or situational issues. According to attribution theorist, one reason for the correspondence bias is "the lack of awareness of situational characteristics" (Gilbert and Malone, 1995). Consequently, creating high causal transparency through the provision of

relevant informational signals about the underlying situational factors reduces the distortion of the correspondence bias. Causal transparency, in the present context, acts as an instrument of non-opportunistic disclosure as the vendor voluntarily provides the consumer with background information on the failure cause. Trust repair literature identifies the provision of information about the causal mechanisms that resulted in a negative event as one important strategy to direct the attributional sense-making in light of an experienced loss or disadvantage (Kramer and Lewicki, 2010; Tomlinson and Mayer 2009). Therefore, we assume that causal transparency mitigates the perception of opportunism triggered by an identified vendor benefit. We, thus hypothesize:

H5: Causal transparency moderates the influence of vendor benefit magnitude on perceived opportunism; that is the perceived vendor benefit will have greater positive effect on perceived opportunism when causal transparency is low than when it is high.

Prior research has shown that in the context of e-commerce consumers' behavioral intention to spread negative eWOM is instigated by negative experiences in a specific online transactions (Santos and Basso, 2012; Goles et al., 2009). Importantly, trust violations through their negative effect on vendors' trustworthiness have been identified to encourage negative eWOM (Goles et al., 2009). The causality between consumers' beliefs about the vendor and behavioral intentions to respond to these beliefs grounds conceptually in the theory of reasoned action by Fishbein and Ajzen (1977). In line with this framework we hypothesize:

H6: The higher a vendor's trustworthiness, the lower is the intention to spread negative eWOM.

4 Methodology

To empirically validate our research model, we conducted an online experiment with a total number of 144 US participants (Θ age=35.0, SD=11.37, 83 male) through a panel company. We used a 2 x 2 mixed factorial design to examine the effects of potential vendor benefit magnitude (VBM) and causal transparency (CTr) on e-vendors' trustworthiness and consumers' negative eWOM intentions. The first factor (VBM: high and low) was manipulated between subjects, and the second factor (whether causal transparency was / was not given) was manipulated within subjects. Participants were randomly assigned to either the high- or the low-VBM condition. Within this condition each participant was exposed to the with- and without-CTr condition. 30 participants were assigned to the control group.

4.1 Procedure and manipulation

The scenario and task presented was to book a hotel room for a friend using a hotel booking website. After participants made a hotel choice, and while proceeding to the checkout page, the price was unexpectedly changed. This price update represents an information failure, as the failure resulted in untimely and inaccurate provision of relevant information (Tan et al., 2016). In the high-VBM condition, the price of the hotel room was updated from previously $83 to $110. In the low-VBM condition the price was updated from previously $83 to $75. We conducted a pretest with 76 participants via an online panel company to ensure that the price change is perceived as a potential vendor benefit. From a user perspective both failures are related to potential vendor benefit, the former by potentially realizing a higher price, the latter by potentially selling lower quality. The underlying actual cause of the failure is not readily assessable for a user, and thus leaves room for users attributional processing. The with-CTr condition was created through the display of an explanation facility that communicated the true cause of the failure to the participants ("Please note that the price changed. A simultaneous reservation/cancellation at the selected hotel triggered a price update"). Participants in the without-CTr condition were not provided with an explanation. Next, participants were asked to type the final price and to decide whether they want to book the room. Following this action, participants completed a

survey which included measures for perceived opportunism, trustworthiness, disposition to trust and negative eWOM. Table 1 summarizes the treatments.

		Causal Transparency	
		Low	High
Vendor Benefit Magnitude	Low	Price **decreased**, explanation is **not** given	Price **decreased**, explanation **is given**
	High	Price **increased**, explanation is **not** given	Price **increased**, explanation **is given**

Table 1.   Overview of Treatments

4.2   Measures

Items for the three trustworthiness dimensions were adapted from prior literature (Bhattacherjee, 2002; McKnight and Choudhury, 2002) and were measured on a 7-point Likert scale (1-strongly disagree to 7-strongly agree), each construct was measured with 3 items. Likewise, items for perceived opportunism were elicited from existing literature (Chiou and Shen, 2006) (6 items). Measurement items for negative eWOM were adapted from Jones et al. (2007) (3 items). We further controlled for participants' disposition to trust using the McKnight et al. (2002) scale (12 items). Results for construct reliability and validity are displayed in table 2. To make sure participants realized the VBM manipulation, they had to manually enter the original price and the new (increases or decreased) price. To check for CTr manipulation, statements of each participant about the experienced scenario were qualitatively assessed. No participant had to be removed from the sample.

	Cronbach's Alpha	Composite Reliability	AVE	Correlations between Constructs *					
				BEN	COMP	INT	TP	PO	Negative eWOM
Benevolence (BEN)	0.928	0.954	0.874	**0.935**					
Competence (COMP)	0.945	0.970	0.890	0.871	**0.949**				
Integrity (INT)	0.957	0.978	0.919	0.915	0.890	**0.960**			
Trust Disposition (TD)	0.930	0.939	0.567	0.298	0.226	0.270	**0.753**		
Perceived Opportunism (PO)	0.960	0.968	0.835	-0.697	-0.667	-0.765	-0.207	**0.914**	
Negative eWOM	0.916	0.947	0.856	-0.363	-0.398	-0.462	-0.022	0.525	**0.925**

* The bold scores in the diagonal are square roots of AVEs

Table 2.   Construct Attributes

4.3   Results

In order to reveal the relationship between information failures and damages of trustworthiness (RQ1) a one-way ANOVA was conducted. The test revealed a statistically significant effect of information failure on e-vendor's trustworthiness, $F(4,251)=18.681$, $p<.001$. A Tukey HSD post-hoc test revealed a statistically significant difference between the control group and the two high-VBM conditions (with-CTr $p<.001$, without-CTr $p<.001$). No significant difference in trustworthiness was found between the control group and the low-VBM conditions. Table 3 shows the mean trustworthiness by treatment.

	Low CTr (without explanation)	High CTr (with explanation)
Low VBM (N=59)	3.34 (INT=3.32, BEN=3.17, COMP=3.53)	3.46 (INT=3.47, BEN=3.22, COMP=3.69)
High VBM (N=54)	1.71 (INT=1.53, BEN=1.72, COMP=1.87)	2.33 (INT=2.19, BEN=2.3, COMP=2.52)
Control Group (N=30)	3.48 (INT=3.51, BEN=3.21, COMP=3.82)	
VBM: Vendor benefit magnitude; CTr: Causal transparency; INT: Integrity; BEN: Benevolence; COMP: Competence; TW: Trustworthiness		

Table 3.   Mean trustworthiness by treatment

A one-way ANOVA was conducted to reveal the effect of VBM and CTr on perceived opportunism. The test revealed a statistically significant difference, $F(4,251)=23.703$, $p<.001$. A Tukey HSD post-hoc text revealed a statistically significant interaction effect of the treatment groups ($p<.001$). Main and Interaction effect are displayed in Figure 2.
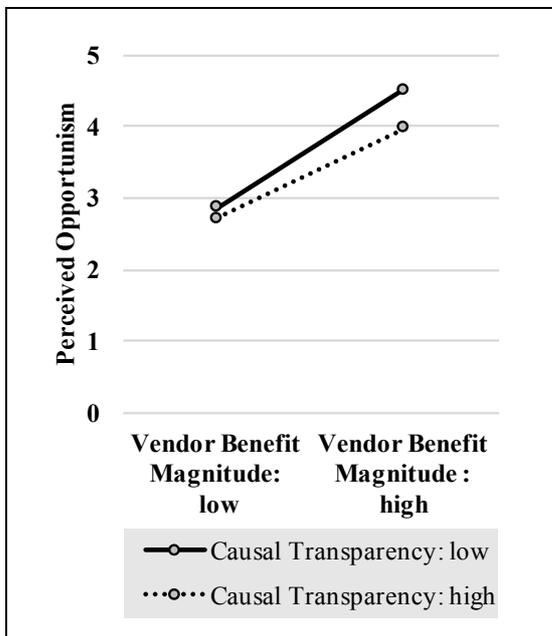

Figure 2.   Interaction effect on Perceived Opportunism

Furthermore, a series of one-way repeated measure ANOVAs was conducted for the low- and high-VBM treatment groups. ANOVA was used to assess the effect of experimental treatments on perceived opportunism, the three trustworthiness dimensions and negative eWOM. Regression was further used to assess the mediating effect of perceived opportunism and the trustworthiness dimensions. Results are shown in table 4 and 5.

Perceived Opportunism → Integrity		Perceived Opportunism → Benevolence	
beta	p-value	beta	p-value
-.90	<.0001***	-.85	<.0001***
Perceived Opportunism → Competence		Trustworthiness → negative eWOM	
beta	p-value	beta	p-value
-.65	<.0001***	-.44	.002**
Perceived Opportunism + Integrity + Benevolence + Competence → negative eWOM			
PO beta	p-value	INT beta	p-value
.44	.06	-.79	.05*
BEN beta	p-value	COMP beta	p-value
.51	.15	.14	.58

Table 4.   Regression and mediation analysis for negative electronic Word-of-Mouth

Source		F	p-value
Trustworthiness	CTr (VBM low)	0.81	.3729
	CTr (VBM high)	18.95	.0001 ***
Integrity	CTr (VBM low)	1.24	.2694

	CTr (VBM high)	17.82	.0001 ***
Benevolence	CTr (VBM low)	0.21	.6476
	CTr (VBM high)	13.53	.0006 ***
Competence	CTr (VBM low)	0.94	.3368
	CTr (VBM high)	18.82	.0001 ***
Perceived Opportunism	CTr (VBM low)	1.06	.3083
	CTr (VBM high)	12.41	.0009 ***
Negative eWOM	CTr (VBM low)	0.18	.6713
	CTr (VBM high)	6.16	.0163 *
CTr: Causal Transparency; VBM: Vendor Benefit Magnitude			

Table 5.   ANOVA results

As hypothesized, VBM had a significant main effect on perceived opportunism, supporting H1, and there was a significant interaction effect with CTr supporting H5. VBM had a greater effect on perceived opportunism without CTr (4,51-2,86=1,65) than with CTr (3,98-2,72=1,25). Integrity and benevolence were then regressed on perceived opportunism to test H2 and H3 as shown in table 4. The hypotheses are supported since perceived opportunism significantly influenced integrity (β=-.9, p-value <.001, adjusted R2=.55) as well as benevolence (β=-.85, p-value <.001, adjusted R2=.51). Following Baron and Kenny (1986), we tested the mediation role of trustworthiness by additionally regressing negative eWOM on perceived opportunism (β=.62, p-value <.001, adjusted R2=.25) and by regressing negative eWOM on perceived opportunism, integrity, benevolence and competence (see table 4). These regression test support the mediation role because perceived opportunism has a significanct direct effect on negative eWOM, but this relation does not hold once the trustworthiness dimensions are included in the regression. Additionally, competence was regressed on perceived opportunism and a significant effect was revealed (β=-.65, p-value <.001, adjusted R2=.29). Our research model did not consider this direct effect of perceived opportunism on competence, therefore competence was regressed on perceived opportunism and integrity to test for mediation. This regression revealed that solely the effect of integrity on competence was significant (β=1.01, p-value <.001, adjusted R2=.74). Integrity, thus, mediates the effect of perceived opportunism on competence. An ANOVA was conducted to test H4. A significant difference regarding competence between the two groups with- and without-CTr was found for the high-VBM condition (F= 18.82, p-value <.000). No significant difference for low-VBM was found. Consequently, H4 is partially supported. Finally, to test H6, negative eWOM was regressed on trustworthiness. The hypothesis is supported since trustworthiness significantly influences negative eWOM (β=-.43, p-value =.002, adjusted R2=.15). Additionally, we regressed negative eWOM on perceived opportunism, integrity, benevolence and competence to understand how the single trustworthiness dimensions' effect negative eWOM. Only integrity significantly affected negative eWOM (see table 4). This effect is still statistically significant when only integrity is regressed on negative eWOM (β=-.5, p-value <.001, adjusted R2=.21). The control variable disposition to trust had no significant effect on perceived opportunism (β=-.24, n.s., adjusted R2=.013) but had a positive effect on trustworthiness (β=.402, p-value <.05, adjusted R2=.005). The control variable gender had no significant effect. Figure 3 summarizes our empirical findings.
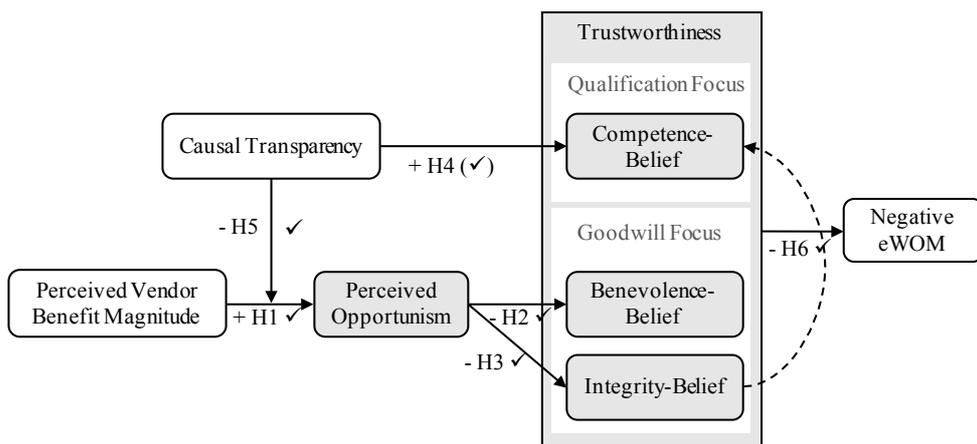
Figure 3.   *Summary of Hypotheses Testing Results*

5   Discussion and implications

The conducted experimental study provides strong evidence for the trust damaging power of information failures in e-commerce interactions. Notably, we found support that consumers blame e-vendor's goodwill-based trustworthiness when an information failure occurs and results in a perceived benefit for the e-vendor (high-VBM). This is interesting since such failures are caused by unpredictable and unintended technological problems, and as such should be classified as failures of competence. Yet, the experiment revealed that such information failures are perceived as opportunistic. Perceptions of opportunism in turn lead to reduced beliefs in the e-vendors' integrity- and benevolence-based trustworthiness. This becomes particularly relevant since integrity represents the basis for any transactional relationship (Gefen, 2002). For e-vendors, this implies that in the light of information failures their goodwill-based trustworthiness needs to be defended. This finding contributes to the understanding about psychological consequences of failure experiences in e-commerce interactions.

The present study, moreover, reveals that design interventions that create causal transparency effectively defend an e-vendors' trustworthiness. By disclosing the true cause of the failure the e-vendor can reduce perceptions of opportunism, and thus defend his goodwill-based trustworthiness. Additionally, such informational signals also positively affect e-vendors' qualification-based trustworthiness by demonstrating analytical abilities. Theoretically, these findings support the importance of studying trust not as a general construct, but to consider the difference between the qualification- and goodwill-based trust dimensions. This differentiation allows to gain deeper insight in the reason for and potential intervention against trust violations.

In the present study, we did not find a significant effect of information failure on trustworthiness when the failure does result in a benefit for the consumer (low-VBM). This might be interpreted as an evidence that only negative outcome failures damage trustworthiness of an e-vendor. Yet, the comparison of the group means shows a tendency to lower trustworthiness even when an information failure results in a potential benefit for the consumer. In such situations, users may doubt about the underlying reasons for the failure. For example, in the case of a price decrease consumers could question if the higher price was displayed to convey a wrong product quality (e.g. price as indicator of quality). This implies that even in situations of positive outcome failures, e-vendors are well advised to increase causal transparency to avoid undesired effects on their trustworthiness.

Negative eWOM has a destructive power for e-commerce relationships (Goles et al., 2009). Our study showed that by damaging the trustworthiness of an e-vendor, information failures increase consumers' intentions to spread negative eWOM in online social networks. Importantly, the study revealed that the

trust defending power of causal transparency reduces these harmful intentions. For e-vendors it is, thus, important to be aware of the negative effects of unintended information failures and to increase causal transparency to prevent negative eWOM. Notably, we found evidence that primarily an increase in integrity-based trust can reduce consumers' intention to engage in negative eWOM. This finding is in line with prior research that indicates that integrity is especially relevant for online buyer-seller relationships (Gefen, 2002). Accordingly, the design of informational signals should especially focus on preventing damages of integrity. Prospective studies should, therefore, focus on the role of integrity damages as a promoter of negative eWOM.

5.1   Limitations

As with any study, there are limitations of the present paper that should be addressed. First, we focused on information failures that trigger perceptions of opportunist intentions from the e-vendor. Future research should, however, also consider other types of failures that are rather related to qualification- than goodwill-based trustworthiness. This would allow to identify and differentiate between trust defending design interventions depending on the failure type. Second, we limited our experiment to two levels of opportunist potential. More conditions could potentially enhance the finding with respect to differences in the trustworthiness dimensions. Finally, in the present study we focused on only one type of design intervention. Future research should also address other measures to defend trust after an information failure.

6   Conclusion

In this paper, we investigated the trust damaging effect of information failures in web-enabled transactions on consumers' intention to spread negative eWOM. Due to the information asymmetry that characterizes online buyer-seller relationships, the occurrence of unintended information failures triggers consumers' perceptions of opportunistic vendor intentions. The conducted experiment revealed that such perceived opportunism directly damages an e-vendor's goodwill-based trustworthiness, and indirectly also damages an e-vendor's qualification-based trustworthiness. Therefore, we established that effective trust repair mechanisms in the context of information failures need to primarily assure an e-vendors' goodwill-based trustworthiness. Our empirical results indicate that the use of explanation facilities to communicate the true cause of an e-service failure is an effective intervention to repair e-vendors' goodwill-based trustworthiness from an interface design perspective. This intervention, finally, mitigates consumers' intention to spread negative eWOM. As trust is a central constituent of transactional relationships, our results emphasize the importance of active trust reconciliation efforts in the light of e-service failures. From a theoretical perspective, we provide evidence for the relevance of considering the multi-dimensionality of trust in the light of negative interactional events. Prospective research should consider the role of each trust dimension, when studying the perceptual and behavioural consequences of other types of e-service failures.

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