

### **Perceived Risk and Deliberation in Retailer Choice: Consumer Behavior towards Online Pharmacies**

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With the rise of electronic commerce, traditional ways of distributing pharmaceuticals have been supplemented by online pharmacies. However, as the online environment offers further opportunities for fraudulent suppliers, there are also dangers associated with the purchase of drugs online (Arruñada 2004). For example, a consumer's health might be jeopardized by counterfeit medications bought online, or sensitive health-related information may be passed on illegally, resulting in adverse social or financial consequences to the individual. A recent report from the UN highlights the significance of the topic: The online distribution of pharmaceuticals is deemed to facilitate the circulation of dangerous drugs by undermining established control mechanisms (International Narcotics Control Board 2005). Threats to consumers are not restricted to dubious suppliers; even genuine online pharmacies suffer from severe deficiencies in, for example, the quality of the medical advice (Stiftung Warentest 2005).

Research on consumer behavior towards online pharmacies is scarce. Büttner and Göritz (2005) found that perceived trustworthiness of an online pharmacy is a crucial factor effecting consumers' intention to buy as well as their actual risk-taking, and that perceived trustworthiness is related to the risk associated with buying medication online. However, a better understanding of how consumers handle these risks when interacting with online pharmacies would be valuable to both retailers and public policy makers. Studying consumer behavior towards online pharmacies can also contribute to research on e-commerce in general: As online pharmacies were legalized in Germany in January 2004 - only a few months prior to the study - the effects of

various factors encountered in more mature markets, such as coexistence of new retailers and established brands or different levels of consumer experience, could be discounted. This enabled an in-depth investigation of the basic processes that underlie consumer choice of online retailers. For this, we drew on the risk-taking framework established by Bauer (1960).

### *Theoretical Background and Development of Hypotheses*

The notion of consumer behavior as risk-taking focuses on the understanding that consumer decisions can have adverse consequences, which may or may not occur (Bauer 1960; for an overview, see Mitchell 1999). The central concept is perceived risk - assumed to consist of a probability and a magnitude component. The probability component refers to the likelihood that a certain action (e.g., buying a product) will have negative consequences for the consumer, whereas the magnitude refers to the severity of those consequences (Dowling and Staelin 1994; Mitchell 1999). If a purchase is perceived as risky, consumers will employ strategies to reduce the perceived risk until it is below their level of acceptable risk or, if they are unable to do so, withdraw from the purchase (Dowling and Staelin 1994). Within this context, Bettman (1973) distinguishes between inherent and handled risk. The former refers to the risk *before* and the latter to the risk *after* the consumer has applied risk-reduction strategies. Thus, inherent risk is a determinant of risk-reduction, whereas handled risk is the result thereof.

Most research on perceived risk has focused on the choice of the product. Here, the product class has been found to contribute to the risk inherent in the purchase decision (e.g. Dowling and Staelin 1994). Therefore, Dowling and Staelin (1994) distinguish between product class risk ("the riskiness of buying 'an average product'", p. 119) and specific product risk

(determined by the particular product under consideration and other factors such as the purchase situation). There are also a smaller number of studies explicitly addressing perceived risk and the selection of retailers. Cox and Rich (1964) report that consumers perceive telephone shopping as risky and mainly tend to purchase low risk products by telephone. Dash, Schiffman, and Berenson (1976) observe differences in the level of perceived risk between specialty store and department store shoppers, while Mattson (1982) shows that the selection of a store type varies with social and financial risk inherent in the purchase situation. In the literature on electronic commerce, the risk associated with online shopping in general (Garbarino and Strahilevitz 2004) and with a specific retailer (Jarvenpaa, Tractinsky, and Vitale 2000) has been found to be adversely related to intention to buy. Biswas and Biswas (2004) demonstrate that signals such as reputation matter more in e-commerce because of higher risks associated with buying online.

What conclusions can be drawn from these studies on retailer selection? First, the level of perceived risk varies with the type of retailer. Hence, and in an analogous manner to product class risk, we will consider the risk linked to buying from an “average” retailer from within a particular class (e.g., online pharmacies) as “retailer class risk”. Both product class risk and retailer class risk have been identified as important factors, but the exact way in which these two factors together contribute to the risk inherent in a purchase decision has not been experimentally investigated. While product class risk has been manipulated in studies on product choice (Gürhan-Canli and Batra 2004), retailer class risk has been neglected in experimental research. Moreover, previous research has focused on the final choice of retailer, rather than on the preceding deliberations. We have therefore experimentally investigated the impact of product class risk and retailer class risk on consumer deliberation when choosing between providers. We focused on a larger part of the decision process than previous studies by examining the influence

of both risk types on the risk perceived as inherent in the decision, on consumers' information processing while on the website, and on final outcomes of the deliberation process.

### *Inherent Risk*

Within the two-component model, the relationship of product class risk and retailer class risk to the risk inherent in a purchase decision that includes retailer selection can be elaborated further. We assume that the magnitude component of inherent risk perceived in a purchase decision is linked to product class risk, and the probability component predominantly related to retailer class risk. Due to the information asymmetry between customer and retailer, consumers do not know in advance whether a retailer can perform well or intends to cheat the customer (performance and relational risk; Das and Teng 2004 p. 101). With regard to these possibilities, a consumer's assessment of a retailer can be described in terms of their judgment of the likelihood that something will go wrong during the transaction (Kee and Knox 1970), and therefore it is linked to the *probability* component of perceived risk (cf. Das and Teng 2004). The magnitude of the consequences, however, can be assumed to be independent of retailer class risk. For instance, the consequences of receiving the wrong medication do not differ whether it is purchased using a 'virtual' online pharmacy or in a 'real' pharmacy.

We further suggest that the *magnitude* component of inherent risk is determined by the product class. For instance, in the pharmaceutical domain, the magnitude of negative consequences differs substantially depending on the class of medication: A fake headache remedy is less critical than an ineffective counterfeit drug for coronary heart disease. In general, the probability of a negative outcome can be assumed to be independent of the product class. For

instance, the likelihood that a hacker gets access to the details of a customer's order or the condition of their health during an online transaction is not linked to the particular class of medication being purchased. Hence, we propose the following hypotheses:

- H1** Product class risk influences the magnitude component but not the probability component of inherent risk in a purchase decision. When product class risk is high (low), consumers judge the seriousness of negative outcomes as high (low).
- H2** Retailer class risk influences the probability component but not the magnitude component of inherent risk in a purchase decision<sup>1</sup>. When retailer class risk is high (low), consumers judge the probability of a negative outcome as high (low).

### *Information Processing*

If a purchase is perceived as risky, the consumer will employ strategies to reduce the perceived risk until it is below his or her level of acceptable risk (Cox and Rich 1964; Dowling and Staelin 1994). One strategy for risk-reduction is to consult information provided by the retailer (Dowling and Staelin 1994; Mitchell and McGoldrick 1996). Hence, we propose that product class risk as well as retailer class risk will influence consumers' information search on the website of an online retailer:

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<sup>1</sup> There might be exceptions regarding certain facets of product class risk. For instance, a higher price involves higher financial risk (magnitude component) to the customer but also provides a higher incentive for the provider to cheat, thereby making fraud more probable (probability component). This does not invalidate our assumptions because financial risk is only one facet of product class risk. Moreover, although such links might exist at the level of objective risk, these links might not be obvious enough to the consumers in order to enter their assessment of perceived risk.

**H3a** When product class risk is high (low), consumers search for more (less) information while visiting the website.

**H3b** When retailer class risk is high (low), consumers search for more (less) information while visiting the website.

Whether customers are persuaded by a website that a purchase is safe depends on how consumers process the information provided. Consumers' level of involvement moderates how such persuasive messages are processed: If involvement is high, consumers focus on the arguments of a message, whereas they process more peripheral cues such as pictures if involvement is low (Petty and Cacioppo 1986). On a website, arguments are provided by the content, while the interface (design, navigation etc.) gives peripheral cues. As the risk associated with a decision has been found to increase involvement (Laurent and Kapferer 1985), we assume that the perceived risk influences which elements of a website consumers tend to focus on:

**H4a** When product class risk is high (low), consumers process more (less) content-related aspects of a website while visiting the online shop.

**H4b** When retailer class risk is high (low), consumers process more (less) content-related aspects of a website while visiting the online shop.

### *Outcomes of Deliberation*

The success of retailers in communicating their trustworthiness is reflected by consumers' perception of this quality. Perceived trustworthiness entails judgments regarding a retailer's competence, benevolence, and integrity as well as the predictability of the retailer's behavior (McKnight, Choudhury, and Kacmar 2002). Perceived trustworthiness has been

claimed to be the “mirror image” of perceived risk (Das and Teng 2004) and has been found to be inversely related to handled risk (Jarvenpaa et al. 2000). Therefore in an analogous manner to handled risk (cf. Bettman 1973), perceived trustworthiness may be assumed to be influenced by inherent risk both in a direct and an indirect way, the latter mediated by information processing related to risk-reduction. Indeed, perceived trustworthiness of online shops has been found to be related to evaluations of the website (Koufaris and Hampton-Sosa 2004) as well as to the risk inherent in a purchase decision (Büttner and Göritz 2005). Hence, we propose the following hypothesis:

**H5** Perceived trustworthiness of an online shop will be determined negatively by product class risk, negatively by retailer class risk, and negatively (positively) by consumers’ negative (positive) thoughts formed during their visit to the website.

If perceived trustworthiness is adversely related to handled risk, then high trustworthiness should encourage consumers to take risks with a retailer (McKnight et al. 2002). Indeed, research on electronic commerce has found that trust fosters the intention to buy from an online retailer (Büttner and Göritz 2005; Jarvenpaa et al. 2000; McKnight et al. 2002). Hence, we propose the following hypotheses:

**H6a** The more trustworthy an online shop is perceived to be, the higher the consumer’s intention to buy from the online shop.

**H6b** Differences in perceived trustworthiness determine a consumer’s choice of online shop. Consumers prefer the option that is judged as more trustworthy.

## Method

*Sample and Procedure.* Ninety-four participants, mainly from the local university, volunteered to participate in the study. Sixty-nine percent were students and another 19% were employed. The mean age was 27.17 years,  $SD = 6.58$ , and 49% were female. Eighty-six percent had purchased at least one product online but only 7% had ever visited an online pharmacy. As an incentive, participants were allowed to choose between a box of cookies and a bottle of wine.

The study was conducted in a laboratory. We applied a 2 (product class risk: low vs. high) x 2 (retailer class risk: low vs. high) design. Product class risk (PCR) was manipulated by variations in the task. In the low PCR condition, participants were told that they had run out of headache remedies and were attempting to order an over-the-counter (OTC) replacement from an online pharmacy. Participants in the high PCR condition were told that they were to order a particular drug for high blood pressure that was only available on prescription. They were told that an older relative with a corresponding prescription had asked them to order the product on their behalf<sup>2</sup>. Retailer class risk (RCR) was manipulated by a short newspaper report that all participants were required to read. The report provided neutral information about internet pharmacies and their price policy. In the high RCR condition, the report also cited critical comments from consumer protection associations that highlighted the problems of inadequate advice and counterfeit drugs; these comments were missing in the low RCR condition. Participants were randomly assigned to one of the four experimental groups.

Participants read the short newspaper report and received instructions to visit the sites of

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<sup>2</sup> The older relative was introduced to render the scenario more realistic and is not supposed to alter other characteristics of the decision (e.g., its significance) beyond the manipulated product class risk. This assumption is supported by preliminary results from an experiment in which we used the same scenarios but independently manipulated product class risk and target of purchase: Purchase decision involvement was influenced by product class risk but not by whether participants purchased for themselves or for an older relative.



two given online pharmacies and to search for either the OTC medication (PCR low) or the prescription drug (PCR high). They were asked to evaluate both pharmacies and were permitted to move around the websites as well as to switch freely between the two providers. The online pharmacy to start with was counterbalanced across the experimental groups. During the experiment, screen content was recorded in a video using screen capture software. After 15 min surfing, participants' thoughts from the shopping episode were assessed using video-cued thought protocols (Silberer 2005): The captured video was presented and participants were asked to concurrently verbalize the thoughts they remembered from the surfing episode. In order to avoid annoying the interviewee, the interview was stopped after the participant had commented on the first 5 min of the original surfing episode.

*Measures.* Inherent risk was assessed after participants had visited the websites because asking for perceived risk beforehand may have produced artifacts by sensitizing participants to potential risks. Nevertheless, it can be assumed that inherent risk was captured by the questionnaire, as the items referred to an assessment of buying medication online *in general* rather than from a particular retailer. For measuring the probability component of inherent perceived risk, six of the seven items from Büttner and Göritz (2005) were used (see table 1). For the magnitude component, the severity of each of the six consequences was estimated on a 7-point rating scale. Perceived trustworthiness was assessed for each online pharmacy using the 12-item scale from Büttner and Göritz (2005), both  $\alpha_s = .90$ . The intention to buy was assessed for each pharmacy using a single 7-point rating item where participants could indicate the likelihood of purchasing at the respective pharmacy (1 = *not at all*; 7 = *yes, definitely*). Moreover, participants were asked to indicate from which online pharmacy they would have purchased in a forced choice set (A, B, none of the two).

Information search and information processing were coded from the commented videos. Two raters analyzed the transcripts of a number of protocols and discussed the coding of the verbalizations until consensus was established. Then, the remaining protocols were coded verbatim by one rater. Each discrete verbalization that matched one of the established categories was counted for each participant. Information search refers to all verbalizations where participants stated that they had actively sought information concerning the products or the provider (example: “Here, I wanted to know more about this”; participant clicks on shipping expenses). For information processing, we distinguished whether the verbalization referred to content (“By comparing the prices, I noticed that this pharmacy was less expensive”) or interface characteristics of the website (“I liked the fact that there were pictures”). Furthermore, all information processing verbalizations were rated as either being positive, negative, or neutral.

## Results

*Inherent Risk.* All statistical tests in this and the following sections have been conducted two-tailed at an  $\alpha$ -level of .05. As the treatments for product class risk and retailer class risk cannot be expected to influence all risk items, perceived risk was analyzed at an item-level instead of forming a scale (Garbarino and Strahilevitz 2004). A 2 x 2 MANOVA on the probability ratings for perceived risk showed a significant main effect for RCR,  $F(6, 82) = 3.65$ ,  $\eta^2 = .21$ ,  $p < .01$ . Further univariate analyses showed that the probability of receiving counterfeit drugs was rated higher when RCR was high (see table 1). The main effect for PCR is also significant,  $F(6, 82) = 2.81$ ,  $\eta^2 = .17$ ,  $p < .05$ . Univariate analyses showed that the risk of late delivery of medication is judged as more likely in the high PCR group, whereas the probability

of receiving counterfeit drugs is higher in the low PCR condition (see table 1). The MANOVA yielded no significant interaction effect,  $F(6, 82) = 1.09, p > .37$ .

TABLE 1  
Mean Differences of Perceived Risk Items (for Main Effects)

		Overall	Product Class Risk		Retailer Class Risk	
			Low	High	Low	High
Loss of privacy	<i>Prob</i> <sup>a</sup>	3.89 (1.57)	3.70 (1.49)	4.09 (1.64)	4.02 (1.57)	3.77 (1.56)
(medical data)	<i>Magn</i> <sup>b</sup>	4.68 (1.89)	4.28 (1.94)	5.11 (1.75) <sup>*</sup>	4.43 (1.93)	4.91 (1.84)
Inadequate Advice	<i>Prob</i>	4.91 (1.51)	4.83 (1.37)	5.00 (1.66)	4.93 (1.52)	4.89 (1.52)
	<i>Magn</i>	5.81 (1.44)	5.55 (1.52)	6.09 (1.32) <sup>†</sup>	5.75 (1.41)	5.87 (1.48)
Counterfeit Drugs	<i>Prob</i>	3.13 (1.35)	3.40 (1.30)	2.86 (1.37) <sup>*</sup>	2.70 (1.37)	3.55 (1.21) <sup>**</sup>
	<i>Magn</i>	6.71 (0.69)	6.64 (0.85)	6.80 (0.46)	6.73 (0.50)	6.70 (0.83)
Credit Card Misuse	<i>Prob</i>	2.70 (1.32)	2.60 (1.15)	2.82 (1.48)	2.81 (1.32)	2.60 (1.33)
	<i>Magn</i>	6.40 (1.21)	6.23 (1.27)	6.57 (1.13)	6.39 (1.37)	6.40 (1.21)
Loss of Privacy	<i>Prob</i>	4.65 (1.58)	4.60 (1.48)	4.70 (1.69)	4.89 (1.32)	4.43 (1.78)
(nonmedical)	<i>Magn</i>	5.00 (1.49)	5.06 (1.31)	4.93 (1.68)	5.20 (1.34)	4.81 (1.61)
Late Delivery	<i>Prob</i>	3.66 (1.45)	3.32 (1.34)	4.02 (1.49) <sup>*</sup>	3.77 (1.43)	3.55 (1.47)
	<i>Magn</i>	5.70 (1.12)	5.40 (0.99)	6.02 (1.12) <sup>*</sup>	5.77 (1.10)	5.64 (1.15)

*Note:* *SD* in parentheses; <sup>a</sup> probability component (1 = *not at all*, 7 = *definitely*); <sup>b</sup> magnitude component (1 = *not serious*, 7 = *very serious*); <sup>†</sup>  $p < .10$ , <sup>\*</sup>  $p < .05$ , <sup>\*\*</sup>  $p < .01$  (main effects)

With regard to the magnitude ratings of perceived risk, a 2 x 2 MANOVA yielded no

significant main effect for RCR,  $F(6, 82) = 0.64, p > .70$ , and no significant interaction effect,  $F(6, 82) = 0.46, p > .83$ . The main effect for PCR slightly misses the  $\alpha$ -level of .05,  $F(6, 82) = 2.14, \eta^2 = .14, p < .06$ . Further univariate analysis showed significant differences for the risk “loss of medical privacy”,  $F(1, 87) = 4.53, \eta^2 = .05, p < .05$ , and for late delivery of medication,  $F(1, 87) = 7.50, \eta^2 = .08, p < .01$ . The consequences of these risks are rated higher when PCR is high (see table 1). In summary, product class risk influences both the magnitude and the probability component. Thus, hypothesis 1 is only partially supported. Hypothesis 2 is clearly supported: Retailer class risk influences the probability component of inherent risk but not the magnitude component.

*Information Processing.* For testing the influence of PCR and RCR on information search activities, a 2 x 2 ANOVA was conducted. The main effect of PCR was significant,  $F(1, 84) = 10.70, \eta^2 = .11, p < .01$ , and as predicted,  $M_{\text{PCR-}} = 2.81$  vs.  $M_{\text{PCR+}} = 3.89$ , thus supporting hypothesis 3a. The main effect of RCR was not significant,  $F(1, 84) = 1.13, p > .28$ , whereas the interaction effect was significant,  $F(1, 84) = 4.92, \eta^2 = .05, p < .05$ . Simple effects tests show that when PCR is high, information search is higher in the high RCR group,  $M_{\text{RCR+}} = 4.39$ , than in the low RCR group,  $M_{\text{RCR-}} = 3.33, F(1, 88) = 5.20, \eta^2 = .06, p < .05$ . No significant difference between low and high RCR was found in the low PCR condition,  $F(1, 88) = 0.72, p > .40$ . This finding partially supports hypothesis 3b.

As an indicator of information processing, we used the proportion of content-related verbalizations to all verbalizations. A 2 x 2 ANOVA showed a significant main effect for PCR,  $F(1, 88) = 47.59, \eta^2 = .35, p < .001$ . The main effect for RCR was significant at an  $\alpha$ -level of .10,  $F(1, 88) = 3.35, \eta^2 = .04$ . No significant interaction was found,  $F(1, 88) = 1.06, p > .30$ . All differences are as predicted,  $M_{\text{PCR-}} = .44$  vs.  $M_{\text{PCR+}} = .68, M_{\text{RCR-}} = .52$  vs.  $M_{\text{RCR+}} = .59$ . Hence,

hypothesis 4a is supported by the data. With regard to RCR, the result could be interpreted as favoring hypothesis 4b because the nature of the hypothesis would allow for one-tailed testing. Effect sizes, however, indicate that its impact is negligible compared to those of PCR.

*Outcomes of Deliberation.* As we assume that perceived trustworthiness is influenced both by information processing and by the two risk types, we regressed intention to buy on four information processing variables (negative and positive content-related, negative and positive interface-related verbalizations; respective proportions on all verbalizations including neutral ones), on product class risk, and on retailer class risk. Due to the video-cued thought protocols being only 5 min in length, we decided to analyze only thoughts referring to the first pharmacy each participant started with and the perceived trustworthiness of this pharmacy. The respective pharmacy was included as a dichotomous control variable in the regression. The regression equation was significant,  $F(7, 80) = 5.57$ ,  $R^2 = .22$ ,  $p < .01$ . However, only the proportions of negative content related thoughts,  $\beta = -.33$ ,  $p < .01$ , and of negative interface related thoughts,  $\beta = -.29$ ,  $p < .05$ , are significant predictors of perceived trustworthiness (all other  $ps > .35$ ). This only partially supports hypothesis 5. The finding might be attributed to the fact that the treatments PCR and RCR only influence certain aspects of inherent risk and that using an aggregated measure of inherent risk might be more accurate. To further investigate this issue, we regressed perceived trustworthiness on the significant predictors from the first regression (i.e., proportion of negative content and interface related thoughts) and on the average of the probability,  $\alpha = .66$ , as well as the magnitude,  $\alpha = .56$ , measures of perceived risk (internal consistency is no useful criterion as the measures are rather formative than a scale; Mitchell 1999). The regression was significant,  $F(4, 80) = 8.64$ ,  $p < .001$ . Negative content-related thoughts,  $\beta = -.26$ , negative interface-related thoughts,  $\beta = -.31$ , and the probability component,

$\beta = -.31$ , contribute significantly to the equation (all  $ps < .01$ ), whereas the magnitude component is not a significant predictor,  $p > .14$ .

With regard to the relationship between perceived trustworthiness and intended risk-taking, we found substantial correlations between perceived trustworthiness and intention to buy from the respective pharmacy,  $r_A = .62$ ,  $r_B = .60$ ,  $ps < .001$ . This supports hypothesis 6a. For testing hypothesis 6b, we used the difference between each pharmacy's perceived trustworthiness. Testing mean differences showed that those who opted for pharmacy A, judged A as more trustworthy than B,  $M_{B-A} = -0.60$ , and that those who opted for B, judged B to be more trustworthy than A,  $M_{B-A} = 0.34$ ,  $t(59) = -4.40$ ,  $p < .001$ , supporting hypothesis 6b.

## Discussion

In the experiment presented here, we systematically investigated the impact of product class risk and retailer class risk on consumers' deliberations regarding retailer choice in an online purchase decision. By manipulating these risk types, we found evidence for differentiated influences on the components of inherent risk. When the retailer class risk is higher, the *likelihood* of a negative outcome is judged to be higher. In contrast, product class risk influences judgments on the *magnitude* of negative outcomes. However, we also found an influence of product class risk on two facets of the probability component. This might be an artifact of the PCR factor's link with requirement for prescription. Having to send the prescription to the pharmacy before receiving medication makes late delivery more probable. Moreover, prescription drugs are paid for directly by the social insurance. This might be perceived as a control mechanism, thereby lowering the probability of counterfeit in the high PCR condition.

The two risk types also have different impacts on consumers' use of risk-reduction strategies. Product class risk fosters information search on the website, whereas retailer class risk only becomes important if product class risk is high. This is consistent with the view of consumers as adaptive decision makers (Payne, Bettman, and Johnson 1993). If little is at stake, consumers might not feel the need to reduce perceived risk. If the possible losses are high, however, consumers consider further information, such as the likelihood of a negative outcome, when allocating resources to the decision (cf. Laurent and Kapferer 1985). A similar interaction effect between retailer class risk and product class risk is reflected in the findings of Cox and Rich (1964) with a more straightforward risk reduction strategy: When product class risk is high, do not buy from high risk retailers.

Another aspect of consumers' adaptations to the riskiness of the purchase decision has been found for the process of evaluating the website. In accordance with our hypotheses derived from research on persuasion (Petty and Cacioppo 1986), participants process more content-related features of the website when product class risk is high and, to a lesser extent, when retailer class risk is high, thus indicating a more in-depth evaluation of the retailer's website. Perceived trustworthiness, the result of the website evaluation, was found to depend on the information processing as well as on the probability component of perceived risk but not on the magnitude component. The finding indicates that the probability component contributes to the evaluation of a particular retailer as a "general component" – or a baseline –, which is then modified by specific, retailer-related judgments. This is related to Dowling and Staelin's (1994) additive model on product class risk and specific risk as constituents of overall perceived risk.

The results stress the importance of considering both retailer class risk and product class risk in research on online shopping. From the findings presented above, we conclude that product

class risk is a determinant of how consumers adapt their strategies when evaluating an online retailer. Retailer class risk adds a little extra to this process, but its main impact can be assumed to be a “base line” to the evaluation of a specific retailer. Whether a particular retailer is judged as trustworthy also depends on the evaluation of the particular retailer. Consistent with findings from research on electronic commerce addressing other product classes (Jarvenpaa et al. 2000; McKnight et al. 2002), perceived trustworthiness has been found to be crucial for a consumer’s intention to buy from a provider and in making the choice between competing online shops.

The results from the study also contribute to the ongoing debate on whether the probability and magnitude components of perceived risk are truly independent from each other (Mitchell 1999). The findings that these two components can be separately influenced and play different roles when evaluating a retailer, provide further evidence supporting the assumption that the two are independent.

This study, however, has certain limitations. In real life settings, a wide variety of risk reduction strategies are available to the consumer (Mitchell and McGoldrick 1996). The strategies in our study were limited by both the laboratory setting (e.g., participants could not consult a friend) and the relative immaturity of the market under investigation (e.g., too young to establish brand loyalty). This, however, allowed us to attribute information search to perceived risk; a link that has not always been successfully established (Gemünden 1985). Furthermore, the high proportion of students in the sample may limit the readiness with which the results can be generalized. Nevertheless, the results pertaining to the relationships between the probability components of perceived risk, perceived trustworthiness, and intention to buy have also been demonstrated in a correlational study on online pharmacies that draws on a more heterogeneous sample (Büttner and Göritz 2005). Restricting the study to pharmacies may also have limited the



extent to which the conclusions can be generalized. We argue, however, that the results can be applied to online shopping in general because we focused on the basic processes underlying consumer choice when developing our hypotheses. This conclusion is supported by the observation that results from our study are consistent with studies on online shops other than pharmacies (see above).

Keeping these limitations in mind, we are able to make a number of recommendations for the management of online shops. Consumers exhibit different behaviors towards online shops depending on the class risk of the product they wish to purchase. High risk customers will search for more information and evaluate it more critically: They will not be satisfied with nice pictures of the products. Nevertheless, both content and interface have to be considered in the design of the online shop. The finding that negative but not positive evaluations contribute to perceived trustworthiness highlights that customers' requirements have to be considered carefully. If customers' requirements are not met, trustworthiness will decline and, consequently, consumers' willingness to use the online shop.

With regard to online pharmacies, what are the implications for public policy makers? At first sight, the results suggest that consumers do well in handling the situation as they adapt their strategies according to the amount at stake. Shall we therefore claim to leave it all up to the market instead of searching for new ways to protect consumers - even in the high risk domain of medication? Our results do not support such a conclusion. The study examines how consumers evaluate online shops - not how effectively they detect fraud. Indeed, results from Grazioli and Wang (2001) show that consumers often fail to do so. The pitfalls consumers encounter during the evaluation of online retailers should be thoroughly investigated by further research. Providing recommendations that would help consumers to make successful decisions in

situations where their health might be at stake would undoubtedly make consumer research more relevant to consumers themselves.

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