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# THE ANTECEDENTS OF CUSTOMER SELF-DISCLOSURE TO ONLINE VIRTUAL ADVISORS

*Completed Research Paper*

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## **Abstract**

*This study proposes and tests a model of the antecedents to customer self-disclosure to an online virtual advisor during the requirements elicitation stage of a skin care product. In such a context, a customer is required to provide personal information for the advisor to identify a suitable skin care product. Consistent with the view of self-disclosure as a form of social exchange, we propose that a customer's intention to self-disclose is affected by the extent to which she believes the disclosures will enable her to obtain a better product, and her perceived information misuse risk. Furthermore, we posit that the customer's perception of the advisor's responsiveness acts both as an antecedent to her disclosure intentions, as well as her perceived benefits and costs. The results of an experimental investigation support the theoretical model.*

**Keywords:** Decision aids, Self-disclosure, Privacy, and E-Business.

## Introduction

The introduction of the Internet as a tool that enables customers to shop remotely has had a profound impact on the way companies conduct their business. This in turn has introduced a number of challenges that directly affect the welfare of customers and businesses alike. Chief amongst these are privacy concerns alleviated by customers' uncertainty about how e-vendors will handle their personal information, and their vulnerability when this information is mishandled (Cho, 2006; Hann, Hui, Lee, and Png, 2007). These concerns have been manifested via customer unwillingness to shop online. In a recent survey conducted by the Pew Internet & American Life Project, 75% of online Americans expressed discomfort about sending personal or credit card information over the Internet (Horrigan, 2008). Further analysis suggests that if this subset of Internet users felt more confident about these disclosures, the share of Internet users shopping online would increase by 7%. Other research has recognized the willingness of electronic commerce (e-commerce) users to pay extra to protect their privacy (Cranor et al., 2007).

Such persistent concerns have given rise to a new stream of research concerned with identifying factors affecting customers' privacy fears, and ways for mitigating them. This research can be generally categorized into two distinct groups: 1) descriptive investigations of factors that heighten or minimize customers' privacy concerns (e.g., Awad and Krishnan, 2006; Olivero and Lunt, 2004), and 2) experimental examinations of factors that enable or inhibit the sharing of personal information, commonly referred to as customer self-disclosures (e.g., Andrade, Kaltcheva, and Weitz, 2002; Berendt, Günther, and Spiekermann, 2005; Cho, 2006; Hann et al., 2007). In the first stream of research, for example, Olivero and Lunt (2004) have found that customers' awareness of information collection results in a shift in concerns from issues of trust to issues of control. Conversely, in one of the earlier studies in the second stream of research, Andrade et al. (2002) demonstrated experimentally that the reputation of an online company and the completeness of its privacy policy reduce the level of customers' concern over disclosing personal information. The offering of a compensatory reward was in fact shown to heighten such concerns.

While collectively, extant research offers a number of important insights regarding why and when customers disclose personal information, three distinct still exist. First, past research has focused on a subset of the types of disclosures customers make online. The majority of prior research addresses customer disclosures of personal information (e.g., address, credit card information) when placing and paying for an order, and/or disclosures made to facilitate profile building and personalization activities. Nonetheless, related research has identified a number of additional stages or activities that a customer performs when ordering or using a product or service online. The adaptation of the Customer Service Life Cycle (CSLC) model (Ives and Learmonth, 1984) to the online context, has resulted in the identification of 14 distinct stages spanning the different activities a customer performs to find, order and use a product or service acquired from an online vendor (Cenfetelli, Benbasat, and Al-Natour, 2008). Not only are the activities performed in these stages different, but so are the information technology (IT) based tools that support them. Consequently, to utilize such tools, a customer needs to make additional types of self-disclosures, such as those concerning her preferences when establishing the requirements for a desired product, or those needed to facilitate the return of a previously purchased one.

A second gap in extant research concerns the exclusive focus on *websites* as the IT artifact under study. Customers' interaction with a website is only but one type of online interactions. Qiu and Benbasat (2005) have identified four additional types that include their interactions with a product, a serviceperson, another customer, and an automated agent that provides product advice.

Finally, in spite of incorporating a variety of constructs and examining a host of independent variables, prior studies have seldom included any design-relevant factors. This in turn has inhibited their ability to provide specific recommendations on how online interfaces should be designed to encourage customer self-disclosures. One exception is the study by Spiekermann et al. (2001), in which disclosing behavior of customers during an online shopping episode was found to be influenced by the nature of their interaction with an automated shopping assistant. Specifically, as participants were drawn into the sales dialogue with the shopping assistant, they seemed to ignore their privacy concerns and disclose intimately personal information.

The present research helps to fill-in these gaps by proposing and testing a model of the determinants of customers' self-disclosures to automated online virtual advisors. Such advisors are decision aids that are tasked with educating customers about products and aiding them in making purchase decisions. In contrast to prior research, this study focuses on information disclosures made during the requirements elicitation stage prior to the placement of an order.

Unlike disclosures made for the purpose of profile building and/or placing an order, customer disclosures during this stage can often extend to socially sensitive information such as, health and personal habits.

Consistent with the view of self-disclosures as a form of social exchange (White, 2004), we propose that customers' willingness to disclose information to virtual advisors is influenced by both the perceived benefits and perceived costs of these disclosures. Specifically, the potential of receiving more personalized product recommendations (perceived performance expectancy), and the perceived potential for the misuse of the information revealed (perceived information misuse risk), both act as antecedents to customers' intentions to disclose the information solicited. Conversely, adopting the view of self-disclosure as an interpersonal situated practice (Antaki, Barnes, and Leudar, 2005), we also propose that customers' intentions to self-disclose are affected by their perceptions of the advisor as an interaction partner. Specifically, we introduce the construct of perceived advisor responsiveness, which refers to the extent to which the advisor is perceived to accurately infer the customer's feelings and concerns, and appropriately respond to them. In an experimental study, we examine the effects of perceived responsiveness on customers' disclosure intentions, and the perceived benefits and costs of self-disclosure. To enhance the potential for offering practical implications to designers of online virtual advisors, this study further investigates how these perceptions can be cued using the design of the virtual advisor.

The remainder of this paper proceeds as follows: First we offer a review of the self-disclosure construct. We then present our research model, develop our hypotheses, and describe our research methodology. Next we outline the results of our empirical investigation. Finally, we offer a discussion and some concluding remarks about the research and practical implications of this study.

## **Literature Review: Self-Disclosure**

### ***The Construct of Self-Disclosure***

Self-disclosure refers to any inside information one communicates to another (Collins and Miller, 1994). This includes "any information exchange that refers to the self, including personal states, dispositions, events in the past, and plans for the future" (Derlega and Grzelak, 1979, p. 152). The information disclosed, in addition to being intimate or private in nature, is normally not readily available to others (McCroskey and Richmond, 1977). While some have restricted the definition to disclosures that are intentional and verbal in nature (Cozby, 1973), most have expanded it to include those made through unintentional and nonverbal means (McCroskey and Richmond, 1977).

Researchers have distinguished between three types of self-disclosures (Morton, 1978): 1) descriptive disclosures reveal facts and information that are not apparent, such as, marital status or place of birth, 2) evaluative disclosures reveal personal feelings, opinions, and judgments, and 3) topical disclosures reveal opinions regarding sensitive topics, such as one's opinions on abortion. Together, the last two types of disclosures have been termed "emotional" disclosures, and are considered riskier than descriptive disclosures (Laurenceau, Barrett, and Pietromonaco, 1998).

The construct of self-disclosure has long been proposed to be multi-dimensional in nature. The amount of self-disclosure (breadth) has received primary attention in early research. Yet, subsequent research (e.g., Altman and Taylor, 1973; Cozby, 1973) has proposed the addition of disclosure depth (the intimacy of disclosed information) and duration (the amount of time spent disclosing) as additional dimensions of the self-disclosure construct. Supplementing the list of sub-dimensions, Jourard (1971) has emphasized the importance of the honesty dimension. Summarizing past research, Wheeless and Grotz (1977) have identified five distinct dimensions making up the construct of reported self-disclosure: 1) amount of disclosure, which concerns the number, frequency and duration of self-disclosures, 2) disclosive intent, which concerns the conscious awareness of self-disclosive behavior, 3) positive-negative evaluation, which addresses whether the self-disclosure content is perceived to reflect positively or negatively on the discloser, 4) honesty-accuracy of disclosures, which reflects the degree to which the disclosures are perceived to be true representations of the inner self, and 5) control of depth, which concerns the degree to which the individual perceives he or she can control the depth or intimacy of what is disclosed.

### ***Customer Self-Disclosure***

Following Altman and Taylor (1973), who conceptualized self-disclosure as a function of rewards and costs, a number of studies have confirmed that customers' willingness to disclose personal information depends in part on

the perceived costs of such disclosures, as well as their valuation of the rewards that can be obtained following these disclosures. For example, in her investigation of customers' motivations for disclosing personal information to relationship-seeking marketers, White (2004) uses social exchange theory to develop her central hypothesis asserting that "consumers will disclose to marketers to the extent that the perceived benefits of doing so outweigh the perceived losses." (p. 42). This study finds that while relationship depth encourages disclosures due to its role in reducing the perceived risks of loss of privacy, it also hinders disclosures when the solicited information has the potential to result in loss of face and embarrassment. Alternatively, the offering of highly valued customized rewards, which can encourage disclosures of sensitive personal information, can in fact reduce the willingness to disclose embarrassing information by those who perceive their relationship with the retailer to be deep.

In a recent study, Norberg, Horne, and Horne (2007) have provided an explanation to what they termed the "privacy paradox". The latter concerns the difference between customers' stated intentions to disclose personal information and their actual disclosing behavior. They provide a theoretical model that highlights the differing roles of perceived risk and trust on the intention to disclose and actual disclosing behavior. Specifically, they argue that because "during actual disclosure situations, salient environmental cues will likely be relied upon when making disclosure decisions" (p. 109), actual disclosure is more influenced by trust-related cues. Alternatively, perceived risks are more influenced by external sources of information, and thus, more likely to exert an effect on disclosure intentions that are detached from a specific shopping context.

In e-commerce, a number of studies have confirmed the existence of a privacy paradox, where customers often disclose more personal information than they intend. These disclosures were shown to be affected by risk-reducing mechanisms, such as the perceived completeness of the privacy policy and the reputation of the company (Andrade et al., 2002). Yet, in other work, the type of privacy policy was unable to explain customers' disclosure of intimate information elicited through non-legitimate questions, but rather, customers seemed willing to provide such information when engrossed in a rewarding social interaction (Berendt et al., 2005; Spiekermann et al., 2001).

Collectively, past research suggests that: 1) the decision to disclose involves an evaluation of benefits and costs, 2) customers disclose more information relative to their stated privacy preferences, 3) the intention to disclose and actual disclosure behavior are influenced by different factors, and 4) certain factors might have both negative and positive effects on disclosure intentions and behavior depending on the type of information solicited.

## **Research Model and Hypotheses**

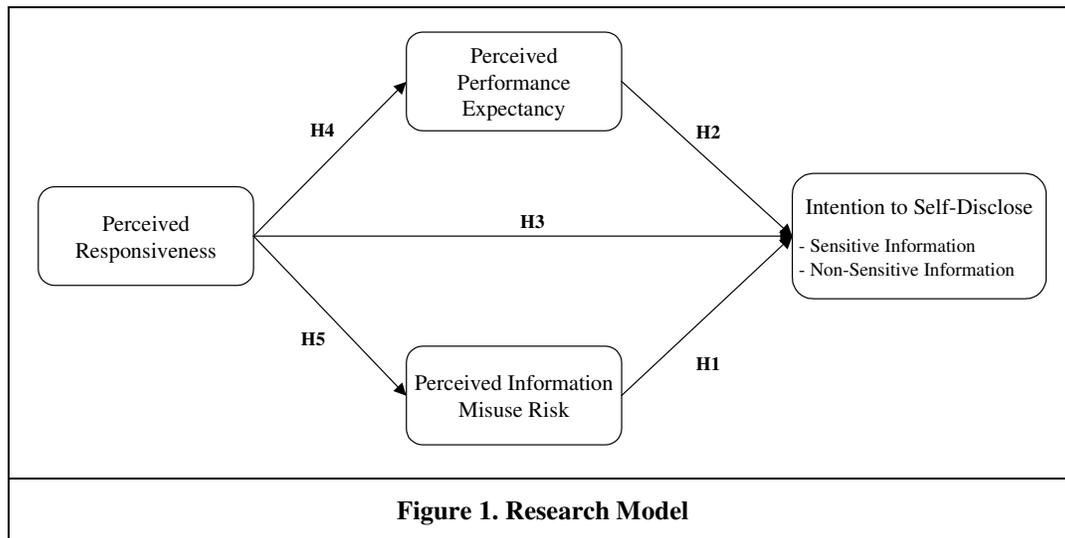
The research model is shown in Figure 1. The model investigates the antecedents to customers' self-disclosures to online virtual advisors. Online virtual advisors typically perform the roles of a tutor educating customers about product attributes, a recommender system offering specific recommendations based on customer-defined criteria, and/or a serviceperson helping to answer questions (West et al., 1999). When serving as a recommender system, virtual advisors solicit information to help narrow down the product search in the form of a series of questions (Xiao and Benbasat, 2007). The questions differ in their level of intimacy and specificity, from those asking about how the product will be used, to more detailed questions about desired product attributes and customers' demographics (Spiekermann, Grossklags, and Berendt, 2001). This difference in the type of information solicited creates variance in the intimacy levels of customer self-disclosures. As a result, in addition to the breadth dimension of customer self-disclosure, the study also focuses on the depth dimension. Specifically, customers' intentions to self-disclose are captured separately for different types of information, namely, socially sensitive information (e.g., health information, sensitive habits) and socially non-sensitive information (e.g., demographics, product preferences).

As has been highlighted in prior research (e.g., Al-Natour and Benbasat, 2009), with the advent of new e-commerce artifacts that possess interactive and human-like characteristics, the utilitarian benefits users expect to achieve through their use (e.g., choosing an appropriate product) are now paralleled by the benefits of engaging in satisfactory social interactions. In addition to being tools that help extend users' cognitive limitations in decision-making, many online virtual advisors are designed to use full sentences, communicate through voice, and assume anthropomorphic embodiments. As a result, these artifacts are endowed with human-like characteristics, which induce customers' attributions of social action (Reeves and Nass, 1996).

In this study, we adopt the Computers are Social Actors (CASA) paradigm (Reeves and Nass, 1996), and propose that users of online virtual advisors will view their interactions with these artifacts as social and interpersonal. Consequently, we conceptualize customers' disclosures to an online virtual advisor as a form of social exchange (White, 2004). In this exchange, customers provide personal information to the advisor in exchange for personalized

skin care recommendations, and in doing so incur a number of costs. Consequently, the model incorporates a number of beliefs about the benefits and costs of disclosing the solicited information.

In contrast to the social exchange view, self-disclosure is seen as an interpersonal process (Antaki et al., 2005). Within this view, the characteristics and behaviors of the target of disclosures during the interaction are proposed to be important determinants of the discloser's willingness to disclose the solicited information. Therefore, the model also incorporates *responsiveness*, a multi-dimensional construct that addresses the extent to which the advisor is perceived to be understanding, caring, and validating while performing its role as an interaction partner.



### *Customer Self-Disclosure as a Function of Benefits and Costs*

It is not surprising that given its four-decade research history, self-disclosure has been studied through a variety of theoretical lenses. Of these, the interrelated social exchange theory and social penetration theory have been most widely used. In its most general sense, social exchange theory posits that all relationships are formed through the use of a subjective cost-benefit analysis and the comparison of alternatives. This analysis constitutes the main rule governing the exchange of resources between two or more individuals over the course of one or more transactions (Emerson, 1981). In the context of relationships, resources are any commodities, material or symbolic, that can be transmitted through interpersonal behavior (Foa and Foa, 1980), and which facilitate the formation and development of relationships (Emerson, 1981). Social penetration theory, on the other hand, focuses on information as the exchanged resource. It posits that closeness in relationships develops through a gradual process of information exchanges via self-disclosures (Altman and Taylor, 1973). These proceed in an orderly fashion from superficial to intimate, and consistent with the social exchange theory, are a function of immediate and forecasted outcomes.

Self-disclosure research in the context of customer-company exchanges has accepted and lent support to the determinant role of rewards and costs, both offline (Norberg et al., 2007; White, 2004) and online (Andrade et al., 2002; Berendt et al., 2005). In their examination of self-disclosure determinants, Sayre and Horne (2000) found that customers are willing to provide personal information in exchange for small discounts at a grocery store. Similarly, in the e-commerce setting, customers were shown to be prepared to accept imperfect privacy protection when presented with the promise of monetary rewards and future convenience (Hann et al., 2007).

Practice has also taken these ideas to heart. Most companies seeking to elicit customer information have utilized a number of approaches to alter this cost-benefit tradeoff. While some companies found it more effective to increase the subjective benefits of self-disclosure by offering rewards in exchange for personal information (e.g., coupons or gifts), others have chosen to reduce the subjective costs of self-disclosure by developing and providing extensive privacy policies that detail how customer privacy is assured (Andrade et al., 2002).

While extant research has proposed and tested for the effects of a variety of benefits and costs on customers' disclosure intentions and behavior, we find that the majority of this research has had a narrow focus. First, this research has primarily focused on task-independent or task-irrelevant disclosures (i.e., disclosures that are not needed to accomplish, or made within the context, of a shopping task). As a result, many of the benefits and costs examined have been external to the task itself, and immediate or promised (i.e., anticipated with a low degree of uncertainty). Also, given the mainly task-irrelevant nature of the solicited information, these benefits, and to a lesser degree the costs, were made obvious to customers, making the exchange itself and its parameters superciliously salient. In other words, rather than investigating the factors that encourage/discourage a customer to self-disclose, prior research has primarily examined customers' willingness to trade-off specific costs for some promised benefits. Second, extant research has almost solely focused on disclosure of information of lower levels of intimacy. In addition to affecting the perceived levels of examined disclosure costs (e.g., the perceived cost of information misuse), this has contributed to limiting the type of salient costs and benefits.

This study takes a different approach. First, by focusing on disclosures made during the requirements elicitation stage, the study essentially examines task-relevant disclosures. Second, instead of introducing the prospect of external rewards, the study focuses on intrinsic benefits that are directly related to the shopping task, or the quality of the product sought. Third, given that disclosures made during the requirements elicitation stage temporally precede task outcomes, the study rather than focusing on immediate outcomes, examines the effects of anticipated outcomes of disclosures of varying degrees of intimacy.

A potential cost of customer self-disclosures that has received significant research attention is loss of privacy due to information mishandling or misuse. In this study, we choose to focus on information misuse risk; defined as the risk that information revealed would be mishandled or inappropriately used or shared with others (Glover and Benbasat, 2008). As proposed by Glover and Benbasat (2008), the probability that information provided to online vendors will be misused becomes salient when requests for personal information are made. Unlike other types of risks that can result in social or psychological harm (Mitchell, 1999), information misuse risk is mostly functional in nature, and typically results in a financial loss. Therefore, the motivation to avoid this risk is driven by the desire for privacy and to minimize unwanted financial harm that could be incurred when such an event occurs (Awad and Krishnan, 2006).

*H1: Perceived information misuse risk negatively influences the intention to disclose.*

In addition to forming beliefs regarding potential costs of self-disclosure, customers will also form beliefs about the benefits that can be obtained as a result of disclosing information to the virtual advisor. In their investigation of such benefits when disclosing to websites, Hui et al.'s (2006) differentiated between extrinsic and intrinsic benefits. Per their conceptualization, intrinsic benefits are ends in themselves, and motivate customers because they appeal to their desire for specific types of experience (e.g., enjoyment). Alternatively, extrinsic benefits provide means with which customers can fulfill other goals, external to the act of self-disclosing itself (e.g., monetary rewards).

While it is possible that self-disclosure during the requirements elicitation stage can result in some intrinsic benefits (e.g., feeling of satisfaction), it is likely that most benefits will be attained in later stages of the shopping task. Of those potential benefits, we examine the effects of perceived performance expectancy on disclosure intentions.

Of the many factors affecting the intentions to use a virtual advisor, the extent to which it enhances a customer's shopping performance has been found to be most significant (e.g., Al-Natour et al., 2008). In fact, protocol analysis has shown that users of virtual advisors form performance expectations even prior to using these aids (Komiak and Benbasat, 2008). From a customer's perspective, using a virtual advisor is typically limited to providing inputs and deciding what to do with the provided outputs (Xiao and Benbasat, 2007). When these inputs are being solicited in the form of requests for self-disclosure, then customers are likely to perform an evaluation of the extent to which providing that information will affect the quality of the outputs.

Consistent with the definition of performance expectancy in the context of general information systems use (Venkatesh et al., 2003), we define the perceived performance expectancy of self-disclosure as the degree to which the customer believes that disclosing the solicited information will help him/her attain benefits in terms of task outcomes. This belief concerning the potential effects of self-disclosure on the quality of outcomes, will then affect the extent to which the customer will be willing to disclose the information solicited (Kam and Chisnar, 2003).

*H2: Perceived performance expectancy positively influences the intention to disclose.*

### ***Self-disclosure as a Situated Interactional Practice***

As described earlier, in addition to being a function of rewards and costs, self-disclosure is a situated interactional practice (Antaki et al., 2005) that is affected by the characteristics of the target of disclosures, and how that behaves during the interaction in which the disclosures take place (Cozby, 1973). Although it has been early recognized as an incremental phenomenon that occurs in dyads (Pearce and Sharp, 1973), early research on self-disclosure has largely overlooked the potential effects of target characteristics and behaviors. Two of the characteristics that have received some research attention are gender (Cozby, 1973) and status (Slobin et al., 1968). This study examines the role of virtual advisor responsiveness in affecting, first, customers' intentions to disclose the solicited information, and second, their perceptions of the benefits and costs of these disclosures.

Since the development of the social penetration theory (Altman and Taylor, 1973), self-disclosure has been closely tied to responsiveness as two components of intimacy. Specifically, intimacy has been considered "the product of a transactional, interpersonal process in which self-disclosure and partner responsiveness are key components" (Laurenceau et al., 1998, p. 1238). In this interaction-by-interaction intimacy process, one person discloses personal information to a partner, and subsequently receives communication that is responsive (Clark and Reis, 1988).

Partners are perceived to be *responsive* when their behaviors (e.g., disclosures, expressions of emotion) address the communications, needs, wishes, or actions of the person with whom they are interacting (Miller and Berg, 1984). Research has distinguished between two types of responsive behavior, namely reciprocating disclosures and appraisal of revealed information. Reis and colleagues (e.g., Clark and Reis, 1988; Reis and Shaver, 1988), who have largely led the effort to better explicate the construct of intimacy, have noted that responsiveness manifested through accurate interpretation of the discloser's communication is a more significant catalyst for continuing disclosure than that manifested through disclosure-reciprocity. Not only was it observed that significant subsequent self-disclosure is unlikely when the disclosure recipient is perceived to be disinterested or uncaring (Reis and Shaver, 1988), but also that recipients of intimate disclosures are liked better when they manifested concern than when they reciprocated with intimate disclosures of their own (Berg and Archer, 1980).

In general, disclosers are more likely to view a target as responsive when the target's communication is perceived to be *understanding* (i.e., accurately capturing the speaker's needs, feelings, and situation), *validating* (i.e., confirming that the speaker is an accepted and valued individual), and *caring* (i.e., showing concern for the speaker) (Reis and Shaver, 1988). Additionally, research has distinguished between three dimensions characterizing the type of responses to another's self-disclosure (Berg and Archer, 1983). Descriptive responses are ones in which intimate facts are revealed. Evaluative responses typically involve the expression of strong emotions or judgments. Finally, topical responses address the same subject of the received disclosure.

In this study, we define responsiveness as the extent to which the advisor is perceived to be accurately inferring the customer's feelings and concerns, and appropriately responding to them. Consistent with prior conceptualizations of this construct (Reis and Shaver, 1988), we view the perceived responsiveness of a virtual advisor to have the three first-order dimensions of understanding, caring, and validating.

The effects of responsiveness on continuing self-disclosure have received some empirical support. For instance, Berg (1987) proposes that self-disclosure and disclosure reciprocity depend on the extent to which people are responsive to other's disclosing behavior. Similarly, Hountras and Anderson (1969) found that clients disclosed most to therapists who were perceived to be empathic. In discussing the observed positive effects of responsiveness manifested through concerned responses on increased intimacy, Berg and Archer (1980) provide three plausible explanations. Most compelling of these, they assert, is that concerned responses demonstrate responsiveness at two levels. First, they indicate a willingness on the part of the target to tailor the exchange to the issue at hand, thus, increasing the proportion of content-related statements included in a reply. Second, concerned responses express evaluative intimacy as they involve the expression of emotions or judgments.

Another dimension of responsiveness is validation. In essence, validating responses are positive evaluations of the disclosed information. In being so, they function as positive reinforcement through communicating the target's approval of the disclosed information, opinions, and emotions. This reinforces the discloser's belief that her concerns are warranted and opinions are valid. Subsequently, this leads to an increase in the discloser's willingness to disclose more about herself, and also to provide more intimate information (Colson, 1968).

*H3: Perceived responsiveness positively influences the intention to disclose.*

An important aspect of responsive communication is projecting awareness and understanding of the discloser's needs and concerns. In the context of customers' disclosures to virtual advisors, this demonstrates to the customer that the advisor understands what he/she values, and hence, has the sufficient prerequisite knowledge of these needs to recommend a suitable product. When further considering the caring dimension of responsiveness, a highly responsive advisor not only demonstrates that it understands these needs and concerns, but also that it cares for, and is sufficiently motivated to mitigate them via finding a suitable product. Consequently, perceived responsiveness on the part of the advisor will strengthen the customer's belief that her shopping performance will be enhanced as a result of revealing the solicited information.

*H4: Perceived responsiveness positively influences perceived outcome expectancy.*

Caring, in its most general sense, serves as an assurance that the advisor will not engage intentionally in behavior that will harm the customer. At minimum, it communicates that the advisor understands the seriousness and social sensitivity of the information disclosed, and consequently, recognizes the significant harm that mishandling that information can cause. Thus, perceptions of a caring virtual advisor can lead to reduction in the customer's belief in and concern about information misuse risk.

*H5: Perceived responsiveness negatively influences perceived information misuse risk.*

## **Research Method**

### ***Experimental Task***

Subjects were invited to interact with an online virtual advisor designed to help customers in choosing skin care products. The main objective of this experimental task was for subjects to familiarize themselves with the virtual advisor. Specifically, subjects were randomly assigned (computer randomization) to use one of four available advisors that differed in a number of characteristics. During the task, the virtual advisor asked the subjects a series of multiple-choice questions that are used to determine a customer's skin care needs, and subsequently recommend personalized products. The questions varied in their intimacy level, ranging from asking about demographics, to asking about sensitive habits and health conditions. A full listing of the questions is available in Appendix A.

Given that the dependent measure in the proposed model concerns customers' intentions to self-disclose, it was necessary that the familiarization task be designed so that subjects do not feel obligated to disclose the solicited information. In other words, in order not to confound our subsequent measure of disclosure intentions, subjects were advised that they were at liberty to decide what information, if any, to disclose (i.e. what questions to answer). It was suggested that if they see fit, they could complete the shopping task as if they were shopping for a friend or an imaginary profile of themselves. On the other hand, after completing the task, subjects were asked a series of attention questions to confirm that they have given the task due consideration (e.g., asked about the specific information that was solicited). Next, subjects were asked to evaluate the virtual advisor and indicate their willingness to disclose the solicited information if they were to use the virtual advisor in a real shopping task.

The use of a skin care product context is due to a number of reasons. First, based on projections from Forrester Research, online sales of health and beauty products will reach \$7.8 billion in 2010 (14% of online retail). Second, health and beauty products are characterized by their high personal relevance, which makes the elicitation of socially sensitive personal information both justified and necessary. In a 2003 survey, customers indicated that unlike other product categories, when purchasing beauty products, they seek a product that fits with their personality/needs, rather than looking for their usual brand or those with the lowest price (Overby et al., 2003). Third, most customers of these products do indeed visit online stores to learn and purchase these products. When asked about their reasons for visiting online beauty websites, more than 80% indicated they do so to learn about new products, while more than 40% have visited these sites seeking beauty advice (Overby et al., 2003).

### ***Treatment Conditions***

To create adequate levels of variance in the exogenous variables, four virtual advisors were designed. The advisors differed in their use of "why" and "how" explanations (Wang and Benbasat, 2007), and their use of expressive and commissive speech acts (Al-Natour et al., 2006).

**Explanations:** Explanation facilities have long been considered a critical component of intelligent and knowledge-based systems (Dhaliwal and Benbasat, 1996). Similar to the explanations provided by human decision makers to explain their choices, explanation facilities provide users with information regarding *why* the system asked certain questions and *how* it processed information to reach its conclusions (Gregor and Benbasat, 1999). Wang and Benbasat (2007) have differentiated between two types of explanations offered by virtual advisors. Why explanations are used to provide justification for why a certain question is asked. How explanations describe how the advisor will use the information provided.

In this study, we propose that the use of why and how explanations will affect a number of the self-disclosure determinants proposed. First, when applied to the context of self-disclosure, why explanations justify asking a certain question, and in so doing, convey the relevance of the solicited information to the decision-making context. Accordingly, why explanations are expected to enhance the perceived performance expectancy of self-disclosure.

Second, we distinguish between two types of how explanations. Predefined how explanations are those that provide a general description of how the information solicited will be used and integrated into the decision-making. Dynamic how explanations on the other hand, are generated based on the specific responses received from the customer. For instance, when responding to a question about skin areas of concern, the customer may indicate one or more areas for which she seeks improvements. Depending on the specific response she provides, the virtual advisor can provide an explanation of how this response will be factored into the decision-making. Therefore, the type of a how explanation, whether predefined or dynamic, is expected to exert differential effects. While a predefined how explanation can affect perceptions of the benefits and costs involved in disclosing the information solicited, it is only when this how explanation is personalized to the customer's response that it will enhance perceptions of the advisor's responsiveness (validating and understanding).

**Speech Acts:** Speech act theory postulates that to communicate is to perform an act, such as stating facts, making requests, making promises, or issuing orders (Searle, 1979). For example, by making the statement "I will call you tomorrow," the speaker commits to a future course of action. Hence, by uttering the sentence the speaker says something, does something by speaking, and affects the "hearer" by what is said. Speech acts are performed to make factual statements (assertives), to request someone to do something (directives), to make promises and commitments (commissives), to effect change (declaratives), and to express a personal feeling (expressives) (Searle, 1979).

While prior research has investigated how directive speech acts can be used to increase perceptions of a virtual advisor's dominance (Al-Natour et al., 2006), it is proposed that other types of speech acts can be used to affect perceptions of responsiveness, as well as influence perceptions of disclosure benefits and costs. More specifically, we propose that expressive speech acts, which are used to express a certain psychological state by the speaker of the message, such as apologizing or expressing concern, can be used by the virtual advisor to manifest understanding and care, and thus, enhance perceptions of its responsiveness.

On the other hand, commissive speech acts, which are used to make promises and commitments, can be used to reaffirm the virtual advisor's commitments. This includes making commissive statements to help the customer (e.g., making commitments to utilize the information revealed to find a more personalized product), and/or reducing the risks involved in revealing personal information (e.g., making commitments to protect the information).

Based on the above analysis, we designed four types of virtual advisors. The first advisor did not use any of the previously described types of explanations or speech acts, and thus served as the control condition. The second advisor was designed to enhance perceptions of disclosure benefits and reduce perceptions of information misuse risk. It accomplished this by providing "why" and predefined "how" explanations in addition to offering commissive speech acts that promise that the information solicited will be kept confidential. The third advisor was designed to enhance perceptions of advisor responsiveness. To that end, the advisor offered expressive speech acts that communicated concern for the customer and appropriate emotions. Whenever possible, this advisor also offered a commissive speech act committing itself to help the customer find skin care products that match the needs expressed and the concerns communicated. Additionally, the third advisor offered dynamic "how" explanations, underscoring its understanding of customers' needs and concerns, and describing how it will work to meet them. Finally, the fourth advisor combined the characteristics of the second and third, and in so doing, worked to both affect perceptions of benefits and costs as well as enhance perceptions of responsiveness. Following is a brief description of the protocol followed by each advisor when asking a question:

- **Advisor 1:** The advisor acted as the control condition. It simply asked the question, and then offered a number of options to answer it (script used by Advisor #1 is available in Appendix A).

- **Advisor 2:** The advisor provided an explanation justifying the need to ask the question. After the question itself, the advisor offered a description of how the information will be used. Next, the advisor expressed a commitment to safeguard the information solicited. Finally, the advisor listed the options for answering the question.
- **Advisor 3:** The advisor started by asking the question, and then directly offered the available options to answer it. After the subject chose an option, the advisor displayed additional text that communicated how the information provided will be used, in addition to two types of speech acts. First, the advisor used an expressive speech act to express its concern for the customer and/or an appropriate emotion, depending on the nature of the question and the option selected. Second, the advisor used a commissive speech act to express its commitment to help the customer by recommending a skin care product that matches the information that was disclosed. For example, if the customer indicated that she suffers from allergies, the advisor would communicate its commitment to finding a product that is allergy-free.
- **Advisor 4:** The advisor incorporated the characteristics of advisors 2 and 3. Before asking a question, the advisor provided an explanation as to why the question is being asked. After asking the question, the advisor provided a description of how the information solicited will be used, and expressed its commitment to protecting the information provided. After the subject answered the question by choosing one of the options available, the advisor explained how the information provided would be used, in addition to expressing concern for the subject and communicating its commitment to helping him/her.

### ***Sample***

Subjects were 47 e-commerce shoppers recruited from a nationwide panel provided by a marketing research firm. An invitation to participate in the study was broadcast via email to members of the panel. Participants were provided with a point-based incentive for their assistance in the study redeemable for various prizes available through the marketing firm. The median age group for subjects was 36-45. Twenty-nine were females and 18 were males. The characteristics of the subjects did not differ across the groups.

### ***Measures***

All constructs used in this study were measured using multi-item scales. Three new scales were developed to measure the three sub-dimensions of responsiveness consistent with their definitions in Reis and Shaver (1988). Perceived information misuse risk was measured using the scale developed by Glover and Benbasat (2008) after adapting it to the context of this study. Performance expectancy was measured using a newly developed scale that was anchored in the general definition of performance expectancy in the context of information systems use (Venkatesh et al., 2003). As mentioned earlier, the intention to self-disclose was captured separately for different types of information. Specifically, based on Morton's (1978) different types of self-disclosures, and Andrade et al.'s (2002) and Spiekermann et al.'s (2001) categories of the types of information solicited in e-commerce settings, we asked for the intentions to disclose: 1) demographical information (e.g., gender, age, ethnicity), 2) information about general habits and preferences (e.g., product preferences, interest and hobbies), 3) information about health and financial history (e.g., medical information, health conditions), and 4) personal feelings, opinions and judgments about sensitive topics (e.g., sexual orientation). All items are available in Appendix B.

## **Results**

### ***Measurement Model and Manipulation Checks***

Factor and reliability analyses were conducted using the Statistical Package for the Social Sciences (SPSS). Construct reliability estimates and item loadings are shown in Appendix B. All scales showed a high level of reliability, and item loadings exceeded the recommended minimum of 0.70, with the exception of the last item of the validation sub-dimension of responsiveness. This item was a reverse-coded item, and was dropped from the scale.

Based on the responses from 47 subjects, the scores for all exogenous variables were examined to ensure that the treatments created adequate level of variance in them. The scores for the three dimensions of perceived responsiveness, namely, caring, understanding and validating had variances of 2.27, 1.76, and 1.63 respectively.

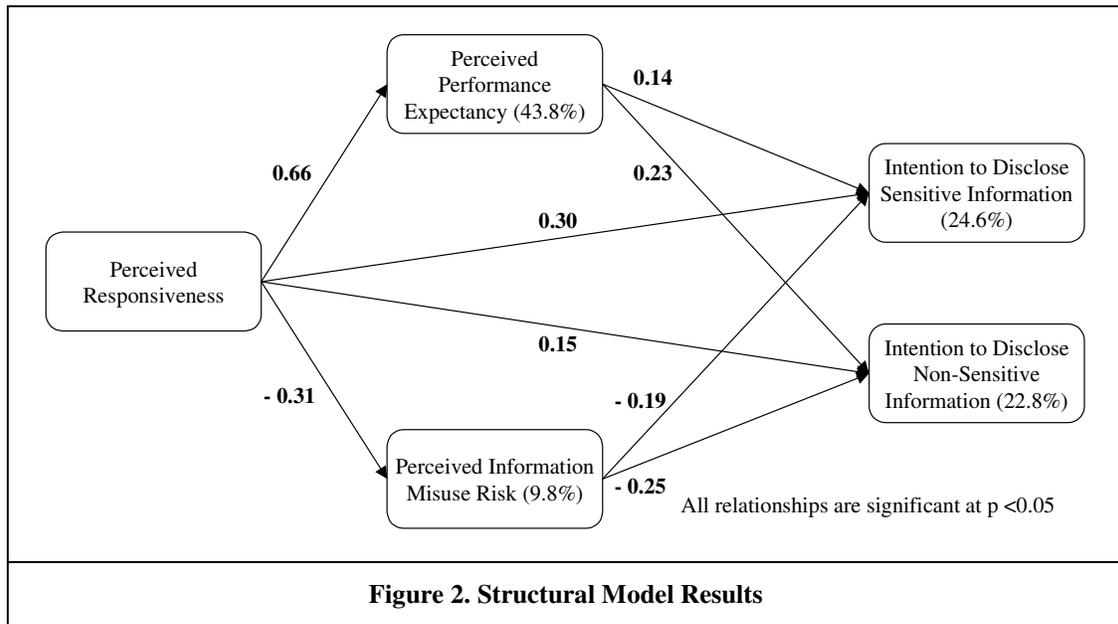
Perceived performance expectancy had a variance of 2.13, while the scores for information misuse had a variance of 2.34. All scores ranged in value from 1 to 7. Overall, the virtual advisors used were able to create an adequate amount of variation in the sub-dimensions of responsiveness, as well as information misuse risk and performance expectancy. The means and standard deviation for the individual treatment groups are shown in Table 1.

	Treatment Group				
	Advisor 1	Advisor 2	Advisor 3	Advisor 4	Overall
Understanding	4.33 (1.28)*	4.24 (1.45)	5.32 (1.21)	5.34 (1.44)	4.86 (1.40)
Validating	4.79 (1.38)	4.40 (1.26)	5.62 (0.92)	5.33 (1.51)	5.09 (1.33)
Caring	4.33 (1.35)	4.23 (1.05)	5.56 (0.93)	5.10 (1.36)	4.87 (1.28)
Performance Expectancy	5.02 (1.49)	5.20 (1.65)	6.02 (1.37)	5.17 (1.31)	5.38 (1.45)
Information Misuse	4.70 (1.30)	3.80 (1.37)	4.44 (1.65)	3.49 (1.58)	4.10 (1.53)

\* The first number is the group mean. The number between parentheses is the standard deviation.

**Testing the Model**

To test our hypotheses, we analyzed the model using Partial Least Squares (PLS) with SmartPLS 2.0 (Ringle, Wende, & Will, 2005). In this model, perceived responsiveness was treated as a second-order construct reflected by the factor scores of its three sub-dimensions. The different intention to self-disclose items were categorized into two groups distinguishing between those that are sensitive in nature (information about health and financial history *and* personal feelings, opinions and judgments about sensitive topics), and those that are non-sensitive (demographical information *and* information about general habits and preferences). The two items for each intention to disclose sub-construct were treated as formative indicators. The weights of all items on their respective sub-constructs were all statistically significant, and are shown in Appendix B.



The results of the structural model are shown in Figure 2. Consistent with hypothesis 1, perceived information misuse risk had a statistically significant negative effect both on intentions to disclose sensitive as well as non-

sensitive information ( $\beta = -0.19$ ,  $p < 0.05$  and  $\beta = -0.25$ ,  $p < 0.05$ , respectively). Performance expectancy exerted a positive effect on intentions to disclose non-sensitive information ( $\beta = 0.23$ ,  $p < 0.05$ ), as well as on intentions to disclose sensitive information ( $\beta = 0.14$ ,  $p < 0.05$ ). Thus, hypothesis 2 was also confirmed.

The effects of responsiveness on intentions to disclose sensitive and non-sensitive information were statistically significant ( $\beta = 0.30$ ,  $p < 0.05$  and  $\beta = 0.15$ ,  $p < 0.05$ , respectively), confirming hypothesis 3. Consistent with our predictions in hypotheses 4 and 5, perceived responsiveness exerted statistically significant effects on performance expectancy and information misuse risk ( $\beta = 0.66$ ,  $p < 0.05$  and  $\beta = -0.31$ ,  $p < 0.05$ , respectively).

## **Discussion**

The results of this study indicate that self-disclosure is both a function of rewards and costs, and also a situated interactional practice that is influenced by the characteristics of the virtual advisor. The effects of the three examined variables on customers' intentions to disclose are generally similar in magnitude. Nevertheless, the individual effects of two of these three variables on disclosure intentions appear to depend on the type of information solicited. Not surprisingly, perceived responsiveness was most influential in the case of sensitive disclosures, confirming the significance of the effects of the characteristics of the target of disclosures on risky disclosure intentions (Berg and Archer, 1980). Alternatively, the effects of perceived performance expectancy on the two types of disclosure intentions are reversely differential. It appears that when faced with requests for intimate and socially sensitive information, the benefits that can be obtained from revealing that information are a less important consideration than the characteristics of the information recipient, or the concerns about how that information will be handled.

The results also highlight the importance of perceived responsiveness as an antecedent to perceptions of performance expectancy and information misuse risk. Essentially, they suggest that by designing highly responsive advisors, online vendors can immensely enhance customers' perceptions of the benefits that can be obtained from using these advisors, and to a lesser degree, lower the risks associated with that use. The descriptive statistics shown in Table 2 further confirm this finding. While they highlight the large difference in the responsiveness scores between Advisor 3 (designed to be high in responsiveness) and Advisor 2 (designed to be high in benefits and low in risks), they also reveal that Advisor 3 enjoys the highest performance expectancy scores; even higher than those for Advisor 2. This suggests that the best way of enhancing performance expectancy perceptions is not through offering benefit-oriented design elements (e.g., why and predefined how explanations), but rather through enhancing perceptions of responsiveness. Alternatively, the modest effect of responsiveness on information misuse risk indicates that a highly responsive advisor can lower perceptions of information misuse risk when compared to a control condition. Yet, the results in Table 2 (Advisor 2 vs. 3) reveal that this impact is lower than that of the risk-reducing design elements that can be incorporated (e.g., making commitments to protect the information disclosed).

Some of the study's limitations include the modest sample size, and the limited number of experimental advisors. The later made it necessary to design advisors that differed in more than one design element, making it impossible to isolate their individual effects. Future research should focus on examining the effects of individual design elements as well as any meaningful combinations of these, so as to identify the most effective designs.

## **Conclusion**

This paper proposes and tests a theoretical model of the antecedents to customer self-disclosures to online virtual advisors. The results highlight the important role of perceived benefits and costs in determining the willingness to disclose. The effects of performance expectancy are observed to be strongest in the case of information that is not socially sensitive. Alternatively, the effects of advisor responsiveness are strongest when predicting the intention to disclose highly sensitive information. This is not surprising given that the sensitivity of the solicited information induces the customer to evaluate the context of these disclosures, as well as the target to which the disclosures are made. Overall, this study confirms that self-disclosure is a form of social exchange determined by perceptions of rewards and costs, and is also a situated interactional practice influenced by perceptions of the interaction partner.

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**Appendix A: Virtual Advisor Script for Advisor #1**

Introduction	<p>Welcome to the Canadian Beauty Store personalization tool.</p> <p>This is the place where guesswork is taken out of skin care.</p> <p>This tool may assist you in selecting a skin care solution that fits with your preferences.</p> <p>The process will take few minutes. Instead of overwhelming you with a huge range of skincare products, only suggestions that match your preferences will be made. To do so, you will be asked a number of questions about your skin, health, and other relevant areas of your life.</p>
Q1	<p>What you would like to accomplish at this stage?</p> <ul style="list-style-type: none"> <li>• Visible improvement in my skin</li> <li>• Help my skin be the best it can be</li> <li>• Keep up with the most advanced skin care products</li> </ul>
Q2	<p>Are there any changes that are going on in your life?</p> <ul style="list-style-type: none"> <li>• Hormonal changes</li> <li>• Weight changes</li> <li>• Health changes</li> <li>• Not enough "me" time</li> <li>• None</li> </ul>
Q3	<p>What is your age?</p> <ul style="list-style-type: none"> <li>• Teens</li> <li>• 20's</li> <li>• 30's</li> <li>• 40's</li> <li>• 50's</li> <li>• 60's</li> <li>• 70's 80's or over</li> </ul>
Q4	<p>What is your gender?</p> <ul style="list-style-type: none"> <li>• Male</li> <li>• Female</li> </ul>
Q5	<p>What is your ethnicity?</p> <ul style="list-style-type: none"> <li>• Asian/Pacific Islander</li> <li>• Black</li> <li>• Caucasian</li> <li>• Hispanic</li> </ul>
Q6	<p>What is your skin type?</p> <ul style="list-style-type: none"> <li>• Normal</li> <li>• Sensitive</li> </ul>
Q7	<p>How would you describe your skin?</p> <ul style="list-style-type: none"> <li>• Oily</li> <li>• Dry</li> <li>• Oily in some parts and dry in others</li> </ul>
Q8	<p>How often do you wash your face?</p> <ul style="list-style-type: none"> <li>• Once a day</li> <li>• Few times a day (1-3)</li> <li>• Many times a day (&gt;3)</li> </ul>
Q9	<p>What do you use to wash your face?</p> <ul style="list-style-type: none"> <li>• Hands</li> <li>• Washcloth</li> </ul>
Q11	<p>What area of skin care would you like to focus on?</p> <ul style="list-style-type: none"> <li>• Skin discoloration</li> <li>• Lines or wrinkles</li> <li>• Acne</li> </ul>

	<ul style="list-style-type: none"> <li>• Dryness</li> <li>• General care</li> </ul>
Q12	<p>What's your favorite smell?</p> <ul style="list-style-type: none"> <li>• Flowery smells</li> <li>• Fresh fruits</li> <li>• Coconuts</li> <li>• Natural smells</li> <li>• No preference</li> </ul>
Q13	<p>Do you suffer from an allergy?</p> <ul style="list-style-type: none"> <li>• Food allergies (e.g., nuts)</li> <li>• Seasonal allergies</li> <li>• Environmental allergies (e.g., dust)</li> <li>• Other types of allergies</li> <li>• None</li> </ul>
Q14	<p>How often do you travel?</p> <ul style="list-style-type: none"> <li>• Never</li> <li>• 1-2 times a year</li> <li>• 2-5 times a year</li> <li>• More than 5 times a year</li> </ul>
Q15	<p>Do you exercise?</p> <ul style="list-style-type: none"> <li>• Never</li> <li>• Rarely (1-2 times a week)</li> <li>• Often (more than 2 times a week)</li> </ul>
Q16	<p>Do you smoke?</p> <ul style="list-style-type: none"> <li>• Never</li> <li>• Rarely</li> <li>• Often</li> </ul>
Q17	<p>Are you sexually active?</p> <ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> </ul>
Q18	<p>Do you suffer from a terminal health condition (e.g., diabetes, high blood pressure)?</p> <ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> </ul>
Q19	<p>Do you take prescription drugs?</p> <ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> </ul>
Q20m (male subjects)	<p>How often do you shave your facial hair?</p> <ul style="list-style-type: none"> <li>• Never</li> <li>• Once every few days</li> <li>• Everyday</li> </ul>
Q20f (female subjects)	<p>Do you use makeup?</p> <ul style="list-style-type: none"> <li>• Never</li> <li>• Rarely (1-4 times a week)</li> <li>• Everyday</li> </ul>
Q21f (female subjects)	<p>Do you use birth control pills?</p> <ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> </ul>

## Appendix B: Instrument

Item	Loading
<b>Understanding</b> (7-point Likert scale, from “strongly disagree” to “strongly agree”): Cronbach’s alpha = 0.934.	
The Shopping Assistant appears to understand customers’ needs.	0.858
The Shopping Assistant appears to understand customers’ feelings.	0.891
The Shopping Assistant appears to accurately capture customers’ needs.	0.929
The Shopping Assistant appears to accurately capture customers’ feelings.	0.880
The Shopping Assistant appears to accurately capture customers’ situation.	0.906
<b>Validation</b> (7-point Likert scale, from “strongly disagree” to “strongly agree”): Cronbach’s alpha = 0.941.	
The Shopping Assistant makes the customer feel like an accepted individual after the customer reveals information through answering a question.	0.950
The Shopping Assistant makes the customer feel like a valued individual after the customer reveals information through answering a question.	0.957
The Shopping Assistant makes the customer feel at ease about the information he/she reveals.	0.931
The Shopping Assistant makes the customer feel awkward about the information he/she reveals [R].	dropped
<b>Caring</b> (7-point Likert scale, from “strongly disagree” to “strongly agree”): Cronbach’s alpha = 0.945.	
The Shopping Assistant appears to care about the customer.	0.959
The Shopping Assistant shows concern for the customer.	0.958
The Shopping Assistant responds compassionately to information the customer reveals.	0.932
<b>Performance Expectancy</b> (7-point Likert scale, from “strongly disagree” to “strongly agree”): Cronbach’s alpha = 0.976.	
Providing this information to the similar Shopping Assistant will help me get a better skin care solution.	0.960
Providing this information to the similar Shopping Assistant will increase the chance that the skin care solution recommended fits my individual needs.	0.991
Providing this information to the similar Shopping Assistant will increase the chance that the skin care solution recommended is personalized to my situation.	0.981
<b>Information Misuse</b> (7-point Likert scale, from “strongly disagree” to “strongly agree”): Cronbach’s alpha = 0.914.	
The information I reveal to the similar Shopping Assistant will likely be misused.	0.941
The information I reveal to the similar Shopping Assistant will likely be inappropriately used.	0.961
The information I reveal to the similar Shopping Assistant will likely be shared with others (e.g., partner companies).	0.872
<b>Intention to Disclose Non-Sensitive Information</b> (7-point Likert scale, from “very unlikely” to “very likely”):	
Demographical information (e.g., gender, age, ethnicity)	0.235*
Information about your general habits and preferences (e.g., product preferences, interest and hobbies)	0.882*
<b>Intention to Disclose Sensitive Information</b> (7-point Likert scale, from “very unlikely” to “very likely”):	
Information about your health and financial history (e.g., medical information, health conditions)	0.645*
Your personal feelings, opinions and judgments about sensitive topics (e.g., sexual orientation)	0.450*
* Number indicates the item’s weight on its respective intention to disclose sub-construct. All weights were significant at $p < 0.01$ .	