

Customers' Self-Disclosures to Online Virtual Advisors

by

Sameh Al-Natour

B.Sc., Simon Fraser University, 2001
M.B.A., Simon Fraser University, 2003
M.Sc., The University of British Columbia, 2005

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ABSTRACT

Business-to-consumer e-commerce has experienced unparalleled growth since its inception a decade and a half ago. Yet, customers' concerns about providing personal information to online vendors, and their discomfort when having to do so, continue to be the chief obstacles to further growth over the same period of time. The research described in this dissertation is motivated by a simple question: What are the factors that encourage or inhibit customers to self-disclose personal information to online IT artifacts? To answer this question, we conducted an exhaustive literature review of self-disclosure, and developed a number of theoretical models of its determinants.

A series of empirical studies were conducted to test the proposed models of self-disclosure determinants in the context of interacting with an online virtual advisor that assists customer in finding a suitable skin care solution. The results highlight that self-disclosure is not only the result of a rational cognitive process, where the benefits to be gained from self-disclosing are compared to the costs. Rather, self-disclosure is also an interpersonal situated practice, where the customer's experience and his/her perceptions of the advisor during the interaction with it significantly affect his/her intentions to self-disclose to the advisor and provide accurate information.

Unlike most of the past studies on self-disclosure in consumer contexts, the research described in this thesis adopts a broader approach to conceptualizing self-disclosure. Combined, the three studies described in this thesis present a complete picture of the different types of antecedents that affect customers' willingness to self-disclose to online IT artifacts, and specifically virtual advisors.

The research described in this thesis makes a number of contributions to theory and practice. In terms of theory, this research offers a comprehensive view of the different factors that affect self-disclosure, and highlight the important role of the interaction experience and contextual factors. In terms of practice, this research highlights the need to design online virtual advisors so interactions with them are clear and enjoyable.

PREFACE

The research described in this thesis was conducted by the student in consultation with members of the supervisory committee. The student was primarily responsible for the identification and design of the research program, performance of the various parts of the research, analysis of the research data, and preparation of the thesis.

The research described in this thesis was approved by the University of British Columbia's Behavioural Research Ethics Board (certificates H08-03020 and H10-02217).

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To My Mother

1 INTRODUCTION

1.1 Problem Definition, Motivation, and Research Questions

The introduction of the Internet as a tool that enables customers to shop remotely and communicate with companies and other shoppers has had a profound impact on the way many companies conduct their business. The web interface is now an online company's *window to the world*, through which communication with customers and vendors takes place, experiences are shaped, and relationships are built (Benbasat 2006). This has prompted the introduction of new information technology (IT) artifacts to assist customers during their interactions with e-vendors. Many of these artifacts are now endowed with human-like characteristics, which has extended our view of them (Reeves and Nass, 1996). Acting as intermediaries between customers and vendors, these artifacts have assumed many roles including, virtual storefront, salesperson, and product advisor, amongst others. Online virtual advisors are one of the most widely employed of these IT artifacts. They are decision aids tasked with educating customers about products, and assisting them in making purchase decisions (Xiao and Benbasat, 2007). The design of these advisors has evolved in the last decade. They have been endowed with interactive and human-like characteristics to substitute for the absence of any human contact during customers' interactions with them. As a consequence, the utilitarian benefits users hope to achieve from using these tools are now paralleled by the benefits of engaging in satisfactory interactions and trustworthy relationships. Rather than being simple tools to help extend users' cognitive limitations in decision-making and choice tasks, the virtual advisors of today, are designed more for social uses and can be viewed more in terms of *social partners*.

These developments have also introduced a number of challenges that directly affect the welfare of customers and businesses alike. Chief amongst these are privacy concerns alleviated by the uncertainty customers have 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; Lwin and Williams, 2003). These concerns have been manifested through unwillingness to disclose personal information to online vendors, and consequently resistance to shop online. Rappa (2004) estimates that more than half of Internet users do not

purchase over the Internet because of their uneasiness about and unwillingness to disclose personal information. 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 shown that when purchasing a product available from a number of websites that have varying degrees of privacy protection, electronic commerce (e-commerce) users are willing to pay extra to protect their privacy (Cranor et al., 2007).

The manifestation of customers' privacy concerns in the form of self-disclosure avoidance did not only impact the extent to which the Internet is used as a shopping medium, but further affected research in Information Systems (IS) and related disciplines (Bélanger and Crossler, 2011, identify more than 100 papers dealing with privacy in online contexts). Specifically, they gave rise to a new stream of research concerned with the investigation of factors affecting customers' privacy concerns and ways of 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 in the form of customer self-disclosures (e.g., Andrade, Kaltcheva, and Weitz, 2002; Berendt, Günther, and Spiekermann, 2005; Cho, 2006; Hann et al., 2007). A representative study of the first stream of research is Olivero and Lunt (2004), who have found that customers' awareness of information collection results in a shift in concerns from issues of trust to issues of control. Specifically, it was shown that risk awareness reduces trust and increases the demand for control and rewards. Conversely, in one of the earlier studies in the second stream of research, Andrade et al. (2002) have shown through an experiment 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 in fact heightens such concerns.

1.2 Research Gaps and Objectives

1.2.1 Research Gaps

While collectively, extant research offers a number of important insights about when and why customers self-disclose personal information to online vendors, and the factors that heighten or lower their privacy concerns, four distinct gaps still exist. First, existing research has focused on a subset of all possible types of customer online self-disclosures. 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 those made for the purposes of profile building and personalization activities. Yet, additional stages or activities a customer performs when ordering and using a product or a service have been identified. 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 are needed to support the execution of these activities. Consequently, to utilize such tools, a customer will likely need to make additional types of self-disclosures, such as those relating to her preferences when establishing the requirements for a desired product or service, or disclosures that facilitate the return or resale of a purchased product or service.

Second, extant research has employed a narrow view of the self-disclosure construct. By broadly focusing on the factors affecting customers' willingness to disclose the solicited information, past research has largely ignored other dimensions of this construct, such as the depth of these self-disclosures and/or their accuracy. While falsification has been previously recognized as a type of Internet users' information privacy protective response (Son and Kim, 2008), it has been rarely empirically examined, and its antecedents and covariates have been largely overlooked. Similarly, due to its focus on a subset of the types of possible customers' self-disclosure online, past research is unable to offer any insights as to the role of information sensitivity in affecting the likelihood and nature of customer self-disclosures. On the other hand, as highlighted by the Pew Internet & American Life Project report, even

when disclosing the requested information, customers may still experience a level of discomfort and unease about doing so, which could evoke some negative emotions. This unease could be rooted in their uncertainty about how the disclosed information will be handled, and equally be driven by their protective self-presentation behavior intended to avoid disapproval and embarrassment. Therefore, to fully understand the enablers and inhibitors of customers' self-disclosures as a necessary condition to transact online, we need to understand the types of emotions being experienced, and examine ways for improving these experiences.

A third gap in extant research comes as a result of the exclusive focus on *websites* as the IT artifact under study. Customers' interaction with a website is only but one type of online interactions. As highlighted earlier, customers can have rich interactions with online virtual advisors who educate them about products and assist them in making product choices. To do so, customers need to disclose information about their needs and preferences. Both the sensitivity of the disclosed information and the value derived from using the virtual advisor will depend on the type of product sought. Generally, it could be expected that the value of the advisor increases for more specialized and sophisticated products (e.g., healthcare products), as customers rarely have sufficient expertise to make choices. Similarly, the specificity of the solicited information is expected to increase as the product becomes more specialized and personalized. This trade-off between the benefits gained from self-disclosures and increased risk due to their sensitive and specific nature, makes the study of disclosures to virtual advisors both interesting and novel. Furthermore, the absence of face-to-face communication and the uncertainty about the advisor's motives will make these self-disclosures potentially riskier than in physical-world interactions. Yet, it is the absence of face-to-face communication that should encourage self-disclosures and reduce the potential for evoking negative emotions.

Finally, in spite of incorporating a variety of constructs and examining a host of independent variables, prior studies have rarely included any design-relevant factors. Therefore, for the most part, these studies are unable to provide any specific guidelines as to how online interfaces can be designed to encourage self-disclosures from customers. A possible exception is Spiekermann, Grossklags, and Berendt (2001) who have found that the

disclosing behavior of customers during an online shopping episode is influenced by the nature of their interaction with an anthropomorphic 3-D shopping assistant. The results demonstrated that as participants were drawn into the sales dialogue with the shopping assistant, they seemed to ignore their privacy concerns and disclose intimately personal information. This goal concerning the identification of design-relevant antecedents for any number of proposed constructs is one that deserves the focus of the discipline's future research efforts (Benbasat and Zmud, 2003; Benbasat and Barki, 2007).

1.2.2 Research Objectives

The research described in this thesis helps to fill-in these gaps. Specifically, it focuses on understanding the antecedents, consequences, and facilitating conditions for customer self-disclosures to automated online virtual advisors. In contrast to prior work, this research focuses on information disclosures made during the requirements elicitation stage preceding the placement of an order. Unlike disclosures made for purposes of profile building or placing an order, self-disclosures made during requirements elicitation can extend, depending on the type of product sought, to socially sensitive information. Therefore, the research described in this thesis not only examines the breadth or amount dimension of self-disclosure, but extends to examining the depth or intimacy dimension of this construct. Moreover, this research further examines the relationship between self-disclosure intentions and the accuracy of these disclosures, as well as investigates the antecedents of both. To inform the design of virtual advisors, so that they encourage self-disclosures from their users, the research described in this thesis also examines the direct and indirect effects of a number of design elements on the different self-disclosure dimensions and their antecedents. Finally, this research pays special attention to the personal factors of the self-disclosure process and examines the role of emotions in facilitating self-disclosures. The three studies described in this thesis are overviewed in Table 1.

Table 1. Overview of the Studies

Study	Overview	Independent Variable(s)	Dependent Variable(s)
Study 1 (Chapter 2)	Develops a general model of the determinants of self-disclosure intentions. The proposed model accounts for differing views of self-disclosure and its antecedents. The study also examines how the design of the virtual advisors can be used to manifest the desired advisor characteristics that subsequently influence perceptions of the direct determinants of self-disclosure.	- Benefits/Costs - Relationship beliefs - Advisor Characteristics	- Intentions to self-disclose
Study 2 (Chapter 3)	Building on findings from Study 1, this study examines the independent effects of specific benefits and costs, and the additional role of experienced emotions (both positive and negative). In doing so, the study investigates these effects on both self-disclosure intentions and the intentions to provide accurate information. Finally, the study examines the moderating role of self-disclosure depth by examining the previously described effects separately for socially sensitive and non-sensitive information	- Benefits/Costs - Experienced emotions - Information type (moderator)	- Intentions to self-disclose - Intentions to provide accurate information
Study 3 (Chapter 4)	The study builds on findings from Study 2 concerning the large effects exerted on self-disclosure intentions by experienced negative emotions and perceived performance expectancy. It tests a parsimonious model of the i) effects of performance expectancy and embarrassment on self-disclosure intentions, ii) how perceptions of these determinants are influenced by contextual factors, and iii) how their effects are moderated by user characteristics.	- Performance expectancy - Embarrassment - Contextual Factors - User characteristics	- Intentions to self-disclose

The first study (reported in Chapter 2) answers the question: *What are the determinants of customers' self-disclosures to online virtual advisors?* To do so, the study develops a comprehensive theoretical model of the different types of determinants to self-disclosures, and highlights their inter-relationships. Based on the extensive literature on self-disclosure in social psychology, the study identifies the different categories of beliefs that affect self-disclosure intentions, while adopting a broader view of the self-disclosure process.

Specifically, consistent with the view of self-disclosure as a form of social exchange (Altman and Taylor, 1973; Omarzu, 2000; Thibaut and Kelley, 1959; White, 2004), Study 1 proposes that customers' intentions to self-disclose to virtual advisors are influenced by both the perceived benefits and the perceived costs of these disclosures. Alternatively, adopting the

view of self-disclosures as an interpersonal situated practice (Antaki, Barnes, and Leudar, 2005) that is affected by relational factors, the study also proposes that a number of relationship beliefs exert positive effects on customers' self-disclosure intentions. Finally, customers' beliefs regarding characteristics of the virtual advisor (e.g., transparency), and those addressing aspects of its behavior as an interaction partner (e.g., responsiveness) are also proposed to act as antecedents to customers' self-disclosures, as well as their beliefs about the benefits/costs of disclosures and the proposed relationship beliefs. To enhance the potential for offering practical implications to the design of virtual advisors, Study 1 further proposes a mechanism for how these perceptions can be influenced and controlled using design elements.

The main focus of the first study is that of understanding the determinants of customers' self-disclosures at a macro level. In contrast, Study 2 (reported in Chapter 3) focuses on customers' experiences while self-disclosing, and examines how these affect their self-disclosure intentions and behavior. It answers the question: *What is the role of evoked emotions in affecting customers' self-disclosures to online virtual advisors?* Specifically, the study investigates and tests for the effects of positive and negative emotions evoked during self-disclosure on customers' self-disclosure intentions. Building on the results from the first study, Study 2 further investigates the effects of specific perceived benefits and costs on evoking positive and negative emotions, as well as their direct effects on self-disclosure intentions. Additionally, the second study examines the relationship between two of the different facets and dimensions of the self-disclosure construct. Specifically, it investigates the determinants of both, the intentions to self-disclose as well as the intentions to provide accurate self-disclosures. It also examines the role of self-disclosure depth (intimacy) in moderating the effects of benefits and costs as well as emotions on self-disclosure and accuracy intentions. To do so, the study compares the determinants of self-disclosure intentions for sensitive and non-sensitive information.

Collectively, the first two studies help us understand the factors that affect customers' intentions to disclose, their disclosure accuracy, and the emotions evoked during self-disclosures. The investigated determinants generally relate to the characteristics of the virtual advisor (the target of disclosures), the customer's relationship with it, and the perceived

benefits and costs of the disclosures. What remains to be investigated is whether contextual factors, such as the nature and richness of the interaction, as well as customer characteristics (the discloser) can affect customers' self-disclosures and their experiences.

The third study (reported in Chapter 4) answers the question: *What is the role of contextual factors in affecting customer' self-disclosures to online virtual advisors?* Specifically, the study investigates the effects of increased social presence on the experienced emotions and perceived benefits, and subsequently, the intentions to disclose to online virtual advisors. Given the established role of many individual traits in influencing self-disclosure intentions and behavior (Cozby, 1973), Study 3 also examines the effects of customers' social anxiety on moderating the relationships between self-disclosure intentions and its determinants.

In the remainder of this chapter, self-disclosure is defined and prior research relating to its antecedents and consequences in general, as well as in consumer contexts, are reviewed.

1.3 Literature Review:

1.3.1 The Self-Disclosure Construct

Self-disclosure refers to the communication of private information to another (Collins and Miller 1994). This typically 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). Such information in addition to being intimate or private in nature is normally not readily available to others (Pearce and Sharp, 1973). While some have restricted such disclosures to being intentional and verbal in nature (e.g., Cozby, 1973), others have accepted that disclosures can be made through unintentional and nonverbal means (McCroskey and Richmond, 1977; Shapiro, Krauss, and Truax, 1969).

Morton (1978) has distinguished between two types of self-disclosures based on the type of information revealed. *Descriptive disclosures* involve the revelation of facts and information that are not apparent, such as, marital status, place of birth, and siblings. *Evaluative disclosures* involve the revelation of personal feelings and affect, opinions, and judgments. Other researchers have distinguished between two sub-types of evaluative disclosures. Those concerning the revelation of opinions and judgments, especially about non-sensitive topics,

were seen as less risky and intimate, and are commonly referred to as evaluative disclosures (Berg and Archer, 1980). Alternatively, the revelation of affect and personal feelings, which often communicates one's feelings and judgments about sensitive topics, has been termed affective or emotional disclosures (Omarzu, 2000). These emotional disclosures are considered riskier than descriptive disclosures or evaluative disclosures concerning opinions about non-sensitive topics (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, both Altman and Taylor (1973) and Cozby (1973), in addition to the breadth dimension of self-disclosures have proposed depth (the intimacy of disclosed information, which corresponds with the three types of disclosures identified by Morton, 1978) and duration (the amount of time spent disclosing) as additional dimensions of the self-disclosure construct. Jourard (1971), supplementing the list of sub-dimensions, has further proposed the honesty of self-disclosures as an additional dimension that ought to be considered. This dimension of honesty or authenticity of disclosures has also been supported by Pearce and Sharp (1973), who also proposed that the intent and willingness of disclosures are important additional parameters.

Summarizing past research, Wheelless 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-disclosures¹, 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.

More contemporary research has mainly considered the breadth, duration and depth dimensions of self-disclosure. The disclosive intent, the accuracy and valence

¹ Item measuring the frequency and duration of disclosures collapsed into a single factor measuring the amount of disclosure.

(positive/negative) disclosures are different manifestations of the decision to self-disclose, and can be viewed as different facets of the self-disclosure construct (Omarzu, 2000).

1.3.2 Self-Disclosure: Antecedents and Consequences

The overwhelming majority of empirical work on self-disclosure has taken the form of “factors and outcomes” (Antaki, Barnes, and Leudar, 2005; Potter and Edwards, 2001). Depending on the role it assumes in a particular model, self-disclosure has often been discussed in relation to a number of fundamental constructs, such as, trust, intimacy, interaction quality, and a host of individual difference variables. When defined as a dependent variable, self-disclosure has been shown to be determined by: 1) characteristics of the disclosing subject, such as, gender (Hook, Gerstein, Detterich, and Gridley, 2003), communication apprehension (McCroskey and Richmond, 1977), attachment style (Mikulincer and Nachshon, 1991), social anxiety (Snell, 1989), and self-awareness (Joinson, 2006) to name a few, 2) characteristics of the target of disclosures, such as, responsiveness (Laurenceau et al., 1998), trustworthiness (Wheeles, 1978), familiarity (Ebersole, McFall, and Brandt, 1977), and the nature of relationship (Howe, Aquan-Assee, Bukowski, Lehoux, and Rinaldi, 2001), or 3) situational factors, such as, the medium of communication (Joinson, 2001; Moon, 2000), prospects of future interaction (Schaffer, Ogden, and Wu, 1987), and anticipation of reward-cost outcomes (Taylor and Altman, 1975).

The identification of the antecedents of self-disclosure has been tied to how it has been conceptualized. Early studies have treated self-disclosure as an indicator of mental health, treating it as a personality construct. The focus in these studies has been on identifying large social patterns of disclosure content and identifying trait-like differences that affect disclosures. These efforts, largely directed by Jourad (1971), have led to the identification of personality correlates of high and low self-disclosure. While these attempts have helped identify some of the correlates of self-disclosure (e.g., extraversion and social approval, Brundage, Derlega, and Cash, 1977), they were confounded by situational contexts, such as the type of relationship with the target of disclosures (Cozby, 1973).

Other researchers have focused on examining self-disclosure as a medium of social exchange, where it was treated primarily as a cognitive process that involves an evaluation of

rewards and costs (Worthy, Gary, and Kahn, 1969). While this stream of research has proposed that receiving disclosure in itself is rewarding, the research emphasis has been directed at understanding what makes a person self-disclose. Anchored in social exchange theory (Thibaut and Kelley, 1959) and its derivative social penetration theory (Altman and Taylor, 1973), research has proposed that self-disclosure is a product of a cost-benefit analysis, in which the subjective utility of disclosing outweighs the subjective risk. In so doing, this stream of research has reduced the process of self-disclosure to a cognitive process, overlooking any potential effects of contextual factors or relational ones.

While it could be argued that when deciding whether to self-disclose or not, one is likely to incorporate many of the contextual and relational factors into their evaluation of the subjective utility and risk of self-disclosure, one of the major criticisms directed at the rewards and costs view of self-disclosure is that it ignores that self-disclosure is in essence an interpersonal behavior situated within an interaction. Considering the characteristics of that interaction, what goes on during it, and those involved in it, are then prerequisites to understanding why people are willing to self-disclose in certain situations but not others. For example, when deciding to disclose to a stranger on a train, or choosing which of the strangers to disclose to, there are no notable benefits or risks to help in assessing the situation. Similarly, self-disclosures in intimate or mature relationships tend to increase in intimacy as the relationship progresses, although the benefits and costs are likely to stay constant throughout the duration of that relationship. Based on this reasoning, proponents of the view of self-disclosure as an interpersonal process have proposed a number of additional factors that help determine self-disclosure decisions. These generally address the characteristics and behaviors of the target of disclosures and the discloser, the discloser's perceptions of the relationship with the target of disclosures, and purely contextual factors such as the medium of communication, amongst others (Antaki et al., 2005; Berg and Archer, 1980; 1982; Cozby, 1973; Laurenceau et al., 1998; Morton, 1978; Omarzu, 2000; Wheelless and Grotz, 1977; Wheelless, 1978).

When self-disclosure is defined as an independent variable, subjects are often asked to evaluate disclosing others on a number of dimensions for which self-disclosure is an antecedent. The effects of self-disclosure have been separately studied in numerous contexts,

where in general, self-disclosure was shown to affect the liking (disclosure-liking hypothesis, Archer, Berg, and Runge, 1980; Berg and Archer, 1983) and trustworthiness (Worthy, Gary and Kahn, 1969; Wheelless, 1978) of the disclosing individual, as well as overall relationship satisfaction (Prager and Buhrmester, 1998). For example, self-disclosures in the context of student-teacher relationships have been shown to play a critical role in student participation (Goldstein and Benassi, 1994), facilitating student-teacher interaction (Fusani, 1994), achieving learning objectives (Cayanus, 2004; Downs, Javidi, and Nussbaum, 1988), as well as affecting perceptions of the teacher's performance (Lannutti and Strauman, 2006).

While traditionally self-disclosures have been studied in the context of face-to-face communication, the effects of self-disclosures communicated through electronic media have also been recently investigated (e.g., student blogging, Harper and Harper, 2006; consumer disclosures online, Moon, 2000; online dating website, Gibbs, Ellison, and Heino, 2006). Furthermore, more recent studies have investigated the effects of self-disclosures communicated by a technological artifact acting as an interaction partner (e.g., Moon, 2000), towards a technological artifact acting as an interaction partner (e.g., Moon, 2003), and alternatively, the determinants of users' disclosures to technological artifacts (e.g., Metzger, 2004; Moon, 2000). For example, Moon (2000) has provided evidence that the disclosure-liking hypotheses (asserts that people like those who self-disclose to them) holds in the context of user-computer disclosures, and further showed that the number, depth and breadth of users' self-disclosure to a computer are governed by the social rules of disclosure-reciprocity and sequence. Disclosures were deeper, broader and more likely when they were initiated and reciprocated by the computer, and when it gradually escalated the intimacy level of the disclosed information. Likewise, user-computer reciprocal self-disclosure was shown to lessen the effects of self-serving attribution biases when purchasing decision were either good or bad (Moon, 2003).

1.3.3 Customer Self-Disclosure

Following Taylor and Altman (1975), who conceptualized self-disclosure as a form of social exchange, research in consumer contexts has almost exclusively focused on the rewards and costs explanation of self-disclosure. In general, these 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 or benefits that can be attained as a result of these disclosures. For example, in her investigation of consumers' motivations for disclosing personal information to relationship-seeking marketers, White (2004) uses social exchange theory as a basis for 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) The study provides evidence that while relationship depth encourages disclosures due to its role in reducing the perceived risks of loss of privacy, it in contrast, hinders disclosures when the elicited 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 "loss of privacy" related information, can in fact reduce the willingness of disclosing 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", which concerns the difference between customers' stated intentions to disclose personal information and their actual disclosing behavior. They contend that expected benefits alone do not account for customers' willingness to disclose personal information in all contexts. Subsequently, 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), it is likely that actual disclosure is more influenced by trust-related cues which retailers strive to manifest. Alternatively, perceived risks are more likely to be formed based on external sources of information, and thus, more likely to exert an effect on intentions that are detached from a specific shopping context.

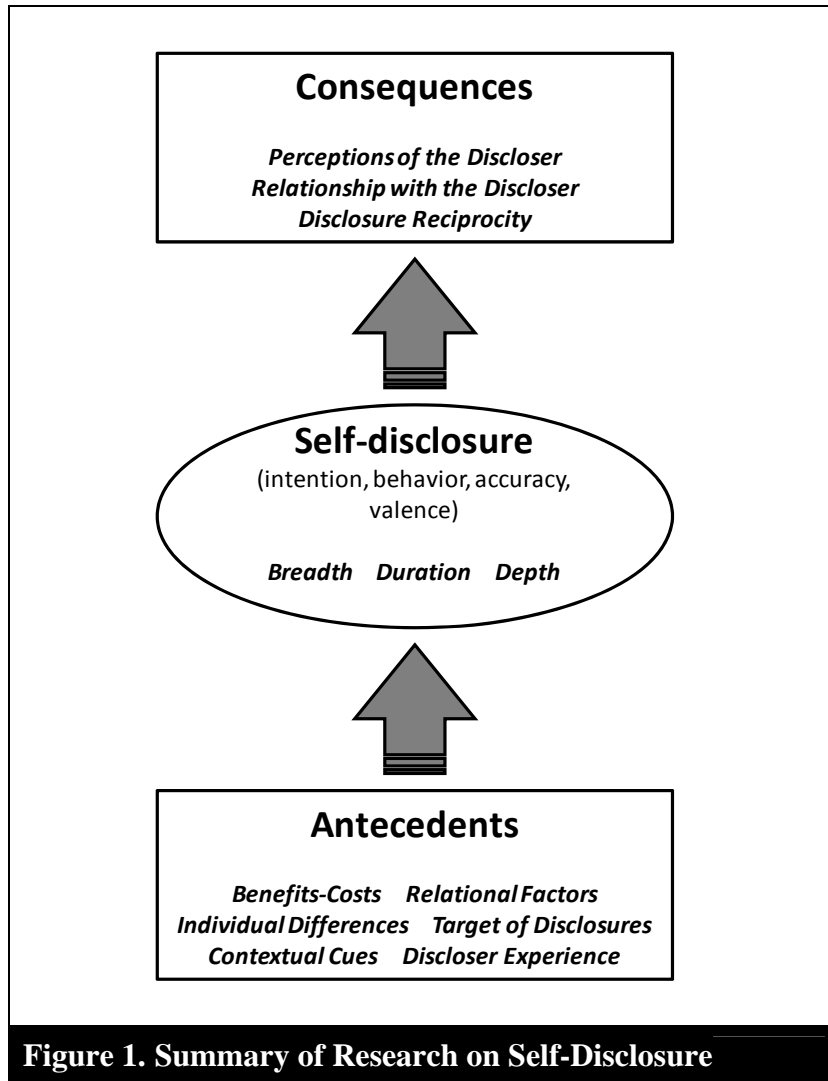
In online shopping contexts, a number of studies have confirmed the existence of a privacy paradox, where customers often disclose more personal information than initially intended. These disclosures seemed to be affected by risk-reducing mechanisms such as the perceived completeness of the privacy policy 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

to be willing to provide such information when they are engrossed in a rewarding social interaction (Berendt et al., 2005; Spiekermann et al., 2001).

Collectively, past research addressing customer self-disclosures suggests the following: 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 disclosing behavior are influenced by additional factors, and certain factors might have both negative and positive effects on disclosure depending on the type of information elicited.

1.3.4 Summary

Figure 1 presents a summary of past research on self-disclosure. Self-disclosure, which has received ample attention in psychology research, has also been widely recognized as a prerequisite and a facilitating condition for the development of close working relationships (Altman and Taylor, 1973), and of caring and mutual understanding (Berg, 1987; Chelune, 1979). Early definitions of self-disclosure have evolved into a well-accepted multi-dimensional conceptualization of the self-disclosure construct. Attempts to understand the determinants and consequences of self-disclosure have been split between viewing it as a form of social exchange determined by the perceived benefits and costs of disclosure, and as an interpersonal behavior situated within an interaction that is influenced by the characteristics of those involved, the context of the interaction and what transpires during it. Overall, past research has been able to solidify self-disclosure's role both as a catalyst for creating highly intimate exchanges and as a profoundly influential antecedent to the success of these exchanges.



In the context of customers’ interactions with retailers, self-disclosure has often been used as a dependent variable that facilitates the completion of a transaction or the attainment of some type of additional benefits (e.g., personalization). Studies conducted in offline and online contexts have reached similar conclusions as to the importance of the perceived consequences of self-disclosures, and the role played by trust and other related relational and social variables (e.g., relationship depth) as antecedents to the intentions and behavior of self-disclosure. Furthermore, these studies underscore the importance of contextual factors and the different dimensions of disclosures, such as self-disclosure depth, on affecting the willingness to disclose and disclosing behavior.

The studies described in this thesis attempt to understand the factors that affect customers' self-disclosure intentions. To do so, they focus on the following:

- Developing a comprehensive model of the antecedents of self-disclosure that accounts for the different views of self-disclosure determinants (addressed in the study reported in Chapter 2).
- Examining the effects of the characteristics of both the target and the source of disclosures (addressed in the studies reported in Chapters 2 and 4).
- Presenting a broad view of the self-disclosure construct, and examining its relevant dimensions and facets, such as depth, breadth and accuracy (addressed in the study reported in Chapter 3).
- Understanding how customers' *experiences* when self-disclosing can affect their self-disclosure intentions (addressed in the studies reported in Chapters 3 and 4).
- Investigating the role of contextual factors (e.g., characteristics of the interaction) in encouraging or inhibiting customers' self-disclosures (addressed in the study reported in Chapter 4).

The remainder of the thesis is structured as follows. Chapter 2 presents a theoretical model of the determinants of customers' intentions to self-disclose to online virtual advisors. The model takes into account the unique characteristics of business-to-consumer (B2C) e-commerce, as well as the differing views of the self-disclosure process. Chapter 2 also details an empirical study that tests the proposed model and overviews its results. Chapter 3 reports on a second experimental study that examines the role of emotions in affecting customers' self-disclosures to online virtual advisors. Chapter 4 overviews a third experiment that explores the effects of situational cues and customer characteristics on their self-disclosure intentions to online virtual advisors. Chapter 5 summarizes the studies conducted, outlines the major contributions of this research, and provides suggestions for future research.

2 THE DETERMINANTS OF CUSTOMER SELF-DISCLOSURE TO ONLINE VIRTUAL ADVISORS

2.1 Overview

As discussed earlier, online virtual advisors are software-based tools that assist customers in learning about products and making purchase decisions. To do so, these advisors will ask customers to disclose information about their product needs and preferences. The disclosed information is then used by the advisor to determine the product(s) that best suits the need of each customer. Therefore, the quality of advice received and the benefits obtained from the interaction with a virtual advisor correlate highly with the amount and quality of information provided by the customer. Hence, these solicited disclosures are a necessary condition to providing competent customer service from the e-vendor's perspective. Yet, customers' uncertainty about how the solicited information will be handled and the absence of face-to-face communication make these disclosures risky from the customer's perspective.

The study described in this chapter is focused on examining the determinants of customer self-disclosures to online virtual advisors during the requirements elicitation stage. Specifically, we develop a theoretical model of the different beliefs that can encourage or inhibit customers' self-disclosures, and through an experiment, test for the effects of these constructs. As overviewed in the previous chapter, self-disclosure is a multi-dimensional construct. In this study, we focus on the breadth dimension of self-disclosure, and more specifically on the intentions to self-disclose information of varying degrees of intimacy, rather than actual disclosure behaviors. In essence, this study investigates these two key research questions:

- What are the determinants of customers' intentions to self-disclose information of varying degrees of intimacy to online virtual advisors during the requirements elicitation stage?
- Can the design of virtual advisors be manipulated so as to influence perceptions of these determinants, and subsequently, encourage customers' self-disclosures?

To identify potential determinants of customers' intentions to self-disclose, we consider the three distinct perspectives of the self-disclosure process described earlier. Specifically, viewing self-disclosures as a form of social exchange, we identify and examine the effects of a number of relevant benefits and costs. We further, examine the effects of a number of relational variables on self-disclosure intentions; and in so doing, investigate the proposition that self-disclosures are relational in nature. Finally, we test for the effects of the characteristics of the virtual advisor on self-disclosure intentions.

To guide the development of the research model and the organization of relevant constructs, we use Al-Natour and Benbasat's (2009) model of users' interactions with information technology (IT) artifacts. Anchored in the theory of reasoned action (Fishbein and Ajzen, 1975), this theoretical model categorizes the different types of beliefs users form during interactions with IT artifacts, and describes how these beliefs can affect the intentions to use these artifacts within a certain capacity.

To my knowledge, this is the first empirical study that examines and explicitly compares the effects of different categories of constructs, derived from different perspective of the self-disclosure process, on customers' willingness to disclose to an e-commerce virtual advisor. It thus fills a void in the literature and contributes to a better understanding of self-disclosures in general, and specifically, self-disclosures to an IT artifact.

The remainder of this chapter is organized as follows. Section 2.2 offers an overview of Al-Natour and Benbasat's theoretical model. Section 2.3 presents the research model and develops the hypotheses. The research method and the results of the experimental examination are reported in sections 2.4 and 2.5. The chapter then concludes with a discussion of the results, limitations, and contributions.

2.2 Interaction-centric Model for the Study of User-IT Artifact Interactions

As has been highlighted in prior research, with the advent of new e-commerce IT artifacts that possess interactive and human-like characteristics, the utilitarian benefits users expect to achieve through using these artifacts (e.g., choosing an appropriate product) are now paralleled by the benefits of engaging in satisfactory social interactions (Al-Natour,

Benbasat, and Cenfetelli, 2006). Rather than being simple tools to help extend users' cognitive limitations in decision-making, many online virtual advisors are being designed partially for social uses. They can be designed to use full sentences and communicate through voice in addition to assuming anthropomorphic representations. As a result, these artifacts can be endowed with human-like characteristics, which have been repeatedly shown to induce customers' attributions of social action (e.g., Moon, 2000; Reeves and Nass, 1996).

Al-Natour and Benbasat (2009) proposed a general theoretical model that posits that evaluations of an IT artifact and users' relevant behaviors are influenced by perceptions users form about this IT artifact in the context of an interaction. Consistent with the Computers are Social Actors (CASA) paradigm (Reeves and Nass, 1996) and the social response theory (Moon, 2000; 2003), they further propose that users of IT artifacts view their interactions with these artifacts as social and interpersonal. Therefore, in contrast to traditional views advocating that the design characteristics of an IT artifact, such as an online virtual advisor, directly affect users' behaviors and evaluations of the IT artifact, it is proposed that customers evaluate these artifacts, and hence their manifested characteristics, within the context of an interaction. Consequently, the design characteristics of an online virtual advisor can be used to manifest certain characteristics on the part of the advisor that will be observed by customers within the context of their interaction with the advisor. Customers will then form beliefs about these manifested characteristics (termed object-based beliefs), which could be individualistic (beliefs about characteristics and behaviors of the IT artifact independent of how they relate to those of the user's) or dyadic (beliefs about characteristics and behaviors of the IT artifact as they relate to those of the user's). These object-based beliefs subsequently affect users' beliefs about the outcomes of using the IT artifact (behavioral beliefs) and beliefs about their relationship with the IT artifact (relationship beliefs). These beliefs in turn affect users' intentions and actual behavior in regards to whether, and how, to use the artifact.

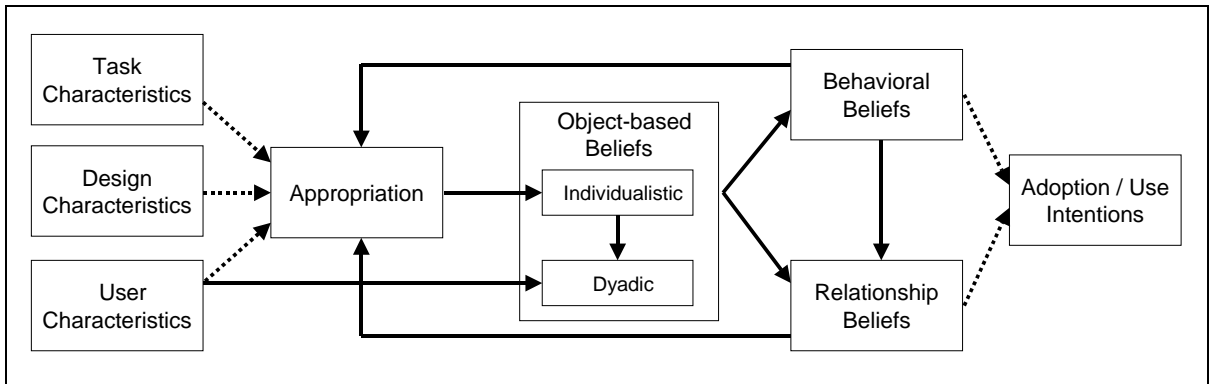


Figure 2. Al-Natour and Benbasat's Interaction-centric Model

The general theoretical model is depicted in Figure 2. It consists of four main components: 1) determinants of the interaction (task, user, and artifact design characteristics), which help shape the structure of a user's interaction with an artifact, 2) the interaction (appropriation and object-based beliefs), which represents how the user chooses to interact with the artifact, and the resulting beliefs formed about the characteristics of that artifact based on that interaction, 3) outcomes and evaluations (behavioral and relationship beliefs), which represent the beliefs formed about the outcomes of using the artifact and the relationship with it, and 4) the dynamic component, which models how behavioral and relationship beliefs formed or updated in one interaction can affect how the artifact is utilized in subsequent interactions.

To study the determinants of customers' self-disclosures to online virtual advisors we adapt the model proposed by Al-Natour and Benbasat. Specifically, we conceptualize the intention to self-disclose to an online virtual advisor as a behavioral intention driven by 1) customers' beliefs about the outcome of disclosing to the virtual advisor, both in terms of the benefits and costs that will be obtained and incurred as a result of disclosing the solicited information, and 2) their beliefs about certain attributes of their relationship with the advisor, such as its level of interdependence and trustworthiness. We further propose that these behavioral and relationship beliefs are affected by customers' beliefs about the characteristics of the advisor, both inherent and those observed within the context of the interaction. The first type of these object-based beliefs, namely individualistic, addresses characteristics of the advisor that remain consistent regardless of the context of the interaction or how the customer behaves.

For instance, given the context of this study, this could refer to any number of salient characteristics of the advisor relevant to its role as the target of the customer's self-disclosures. The second type, which could be referred to as dyadic or interaction-level, concerns characteristics and behaviors of the advisor within the context of a specific interaction in response to the customer's behaviors. These could address, for example, how the advisor responds to the information the customer reveals in response to one of the advisor's questions. We further propose that these interaction-level beliefs have a direct effect on the intentions to self-disclose. This is based on research confirming that self-disclosure intentions and behaviors are influenced by contextual factors unique to each interaction.

The objective of this study is to examine the determinants of customers' self-disclosure within a typical interaction with a virtual advisor that has a fixed design and the exact function of eliciting their requirements and recommending suitable products. Given that the appropriation construct, defined as user's choices in terms of how to utilize the artifact, assumes that users have options in how they utilize the advisor, it is irrelevant to the context of this study. Nonetheless, it is important to note that the idea of appropriation is relevant to self-disclosures to virtual advisors in general. When presented with different ways in which the virtual advisor can be utilized, customers with higher levels of privacy concerns may opt to appropriate the role of that advisor or the process it follows, so that it changes the manner in which it asks questions or processes the information revealed.

Similarly, given that the objective of this study is to examine self-disclosure intentions' determinants within the context of a typical shopping task, the task characteristics remain constant and are subsequently excluded from the proposed research model. On the other hand, while we believe that customer characteristics would have an impact on their self-disclosure intentions and their determinants, we do not consider these in this study. Certain relevant customer characteristics are examined in Study 3 (described in Chapter 4).

Finally, in this study we focus on the effects of the design characteristics of the virtual advisor on cueing perceptions of its characteristics (i.e., object-based beliefs). Essentially,

this allows us to answer the second main research question of how virtual advisors can be designed to encourage self-disclosures from their users.

2.3 Research Model and Hypotheses

The research model is shown in Figure 3. The model adopts the general framework proposed by Al-Natour and Benbasat for the study of user-IT artifact interactions, and 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 that helps answer customers' questions (West et al., 1999). When serving as a recommender system, these virtual advisors elicit information to help narrow down the product search in the form of a series of questions (Xiao and Benbasat, 2007). These questions can range from asking about how the product will be used, to more detailed questions about desired product attributes, customers' demographics and/or preferences (Spiekermann, Grossklags, and Berendt, 2001). This difference in the type of information elicited creates a variance in the intimacy levels of elicited customer self-disclosures, which depending on the product context, could introduce a number of unique costs of these disclosures (White, 2004).

Consistent with prior research, the model conceptualizes customers' self-disclosures to an online virtual advisor as a form of social exchange (White, 2004). In this exchange, customers provide personal information to the advisor (and in so doing, incur a number of costs) in exchange for personalized product recommendations and/or other benefits that can be obtained from the interaction. Consequently, the model incorporates beliefs about the benefits and costs of disclosing the elicited information. Consistent with the definition of behavioral beliefs proposed by Al-Natour and Benbasat (2009), customers' beliefs about the costs and benefits of disclosure address specific possible outcomes of their self-disclosure behavior, subsequent to the behavior itself.

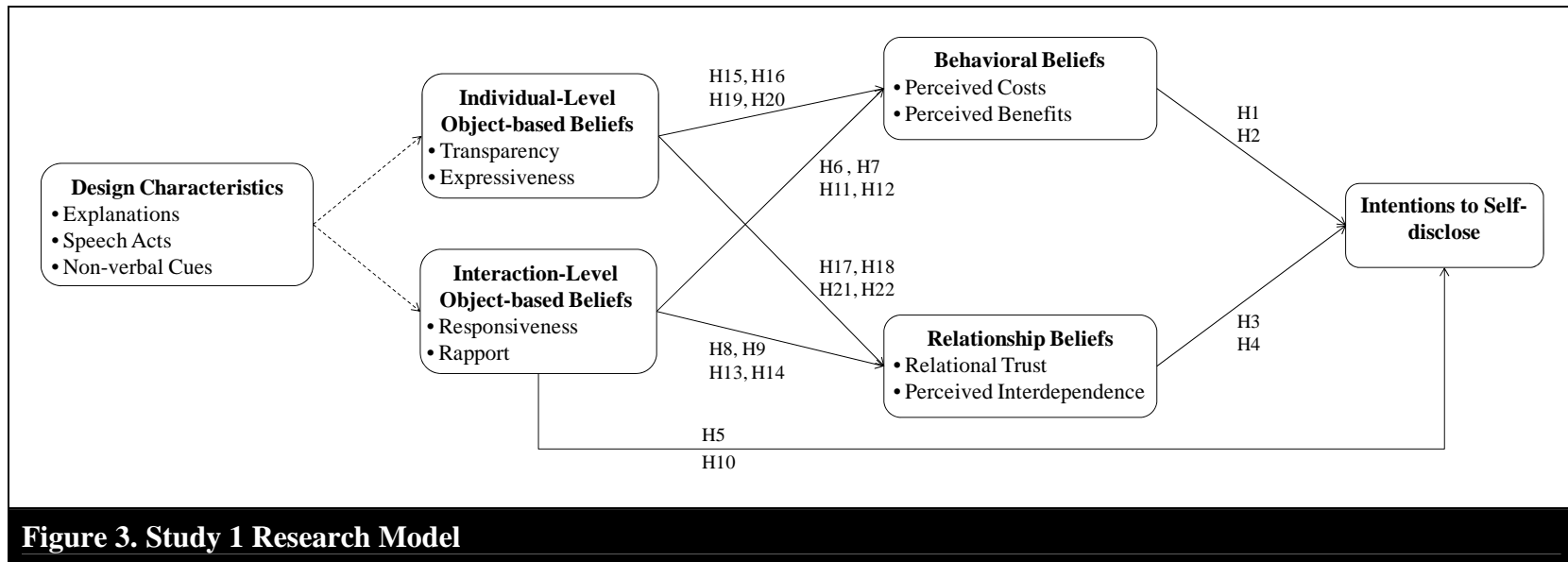
In contrast to the social exchange view, which treats self-disclosure as a purely cognitive process, self-disclosure has also been viewed as an interpersonal process (Antaki et al., 2005; Berg and Archer, 1980; 1982; Cozby, 1973; Laurenceau et al., 1998; Morton, 1978; Omarzu,

2000; Wheelless and Grotz, 1977; Wheelless, 1978). In other words, rather than just being a process of evaluating the rewards and costs, because it is situated within an interpersonal interaction, self-disclosure is an interpersonal behavior that is influenced by the characteristics of that interaction, what goes on during it, and those involved in it. These include the characteristics and behaviors of the target of disclosures and the discloser, the discloser's perceptions of the relationship with the target of disclosures, and purely contextual factors such as the medium of communication, amongst others. Therefore, the model also incorporates two relationship beliefs that were shown to affect the willingness to self-disclose (relational trust and interdependence), and a number of beliefs that address relevant characteristics of the virtual advisor and its interaction with the customer (transparency, expressiveness, responsiveness, and rapport). The model does not incorporate any of the purely contextual factors or the characteristics of the discloser. These are synonymous with the task and user characteristics in Al-Natour and Benbasat's model, which are not examined in this study, as discussed earlier.

Finally, in addition to proposing and testing a model of customer self-disclosure determinants, the current study aims to inform practice by recommending guidelines on how virtual advisors can be designed. Specifically, the study investigates the role of a number of design elements in helping to manifest desired advisor characteristics, which subsequently increase (reduce) perceptions of self-disclosure benefits (costs), and manifest desired relational characteristics.

Table 2 lists and defines the model's constructs, and categorizes them using the Al-Natour and Benbasat framework.

Table 2. Study 1 Constructs and Definitions		
Construct	Definition	Sub-dimensions
<i>Behavioral Intention</i>		
Intentions to Self-disclose	The customer intention to provide the solicited information when requested by the advisor in a future interaction.	
<i>Behavioral Beliefs</i>		
Perceived Benefits of Self-disclosure	The extent to which the customer believes that he/she will obtain benefits as a result of disclosing the elicited information.	Performance expectancy; Social adjustment
Perceived Costs of Self-disclosure	The extent to which the customer believes that he/she will incur costs as a result of disclosing the elicited information.	Loss of privacy; Loss of face
<i>Relationship Beliefs</i>		
Trust	The extent to which the advisor is perceived to have competence, benevolence, and integrity.	Competence; Benevolence; Integrity
Perceived Interdependence	The extent to which the customer believes he/she and the advisor influence one another's experiences.	Level of dependence; Basis of dependence; Covariation of interests
<i>Object-based Beliefs – Interaction-Level</i>		
Perceived Responsiveness	The extent to which the advisor is perceived to be accurately inferring the customer's feelings and concerns, and appropriately responding to them.	Caring; Understanding; Validating
Perceived Rapport	Perception of being in-sync with the advisor, and of the degree to which his/her interaction with the advisor is marked by harmony, conformity, and positivity.	Attentiveness; Positivity; Coordination
<i>Object-based Beliefs – Individualistic</i>		
Perceived Transparency	The extent to which the inner workings of the virtual advisor are <i>known</i> to the customer.	Purpose; Process
Perceived Expressiveness	The extent to which a virtual advisor conveys human-like emotions and feelings in its communication with customers.	



2.3.1 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 those, 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 by the use of a subjective cost-benefit analysis and the comparison of alternatives (Thibaut and Kelley, 1959). This cost-benefit 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, 1976).

Social penetration theory, on the other hand, focuses on information as the main resource being exchanged in relationships. It posits that closeness in relationships develops through a gradual process of exchanging this resource through self-disclosure (Altman and Taylor, 1973). These self-disclosures proceed in an orderly fashion from superficial to intimate levels of exchange, and as predicted by social exchange theory, as a function of both immediate and forecasted outcomes (Taylor and Altman, 1975).

Research on self-disclosures in the context of customer-company exchanges has accepted and lent support to the determinant role of rewards and costs, both offline (e.g., Norberg et al., 2007; Sayre and Horne, 2000; White, 2004) and online (e.g., Andrade et al., 2002; Berendt et al., 2005; Spiekermann et al., 2001). For example, 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 an e-commerce setting, Hann et al. (2007) showed that customers are prepared to accept imperfect privacy protection when presented with the promise of monetary rewards and future convenience when registering for a website.

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 and encourage consumers to self-disclose. While some companies found it more effective to

increase the subjective benefits of self-disclosure by offering rewards (e.g., coupons or gifts) in exchange for personal information, 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 customer disclosure intentions and behavior, we find that the majority of this research has been narrow in its focus. First, this research has primarily focused on task-independent or task-independent 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 elicited disclosures, these benefits, and to a lesser degree the costs, were made evident to customers, making the exchange itself and its parameters 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. It should come as no surprise that disclosing more intimate information brings with it a number of new risks that may, directly or indirectly, affect the benefit-cost relationship.

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 and benefits, the study focuses on benefits that are inherent and obtained as a result of the shopping task itself. Third, given that self-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 self-disclosures of varying degrees of intimacy.

In light of the study's focus, there is a need to understand the mechanisms underlying the formation of customers' expectations of benefits and costs. For this we turn our attention to information-processing theories in the context of motivated behavior. The expectancy-value theory (ETV) put forth by Ajzen and Fishbein (1980), which forms the basis on which Al-Natour and Benbasat's (2009) model is built, proposes that intentions to engage in a behavior are determined by beliefs about the outcomes associated with engaging in that behavior. Specifically, when deciding whether to engage in a certain behavior, an individual forms an expectation, created or modified based on the result of a calculation comprised of beliefs about the outcomes of engaging in that behavior and values assigned as weights to these beliefs. Thus, similar to the conceptualization of self-disclosure as a social exchange governed by immediate and/or expected rewards and costs (Omarzu, 2000), ETV emphasizes the role of behavioral beliefs as determinants to the intention and behavior of self-disclosure.

In this study, we focus on two specific benefits and costs that we propose are salient when deciding whether to disclose information elicited by the virtual advisor, and hence, contribute to the customer's overall perceptions of the benefits of costs of self-disclosure. In other words, to examine the effects of perceptions of benefits and costs, we operationalized these two constructs via focusing on a parsimonious set of salient benefits and costs. In the next section, we offer a discussion of why we believe the chosen benefits and costs are salient and likely to contribute to the overall effects of perceived benefits and costs. Subsequently, we make general hypotheses concerning the proposed effects of overall perceived benefits and perceived costs on customers' self-disclosure intentions.

2.3.1.1 Perceived Costs: Loss of Privacy and Loss of Privacy

Potentially, a customer could be exposed to any number of factors that may cause them harm as a result of purchasing a product. Mitchell (1999) classifies the different types of harm into five categories (financial, time, psychological, social or physical). These types of harm have been adapted to the context of e-commerce by Glover and Benbasat (2010). In the context of this study, we believe that some of these harms are potential consequences of customer self-disclosure, especially in the case of socially sensitive information. Specifically, we posit that financial, psychological and social harm can emerge as consequences of self-disclosing to an online virtual advisor, since such disclosures may potentially lead to a loss of esteem (loss of

face) and/or information mishandling (loss of privacy). While we see no direct role of physical harm in our context, we believe that one of the benefits (performance expectancy) can act to reduce perceptions of the potential harm of time waste. Similarly, the other examined benefit of social adjustment, can act to reduce perceptions of social and psychological harm.

Guided by prior analysis of the potential negative consequences of disclosures that are socially risky (White, 2004), we propose that the perceived risk of “loss of face” will exert a negative effect on customers’ willingness to self-disclose to an online virtual advisor. Loss of face is defined as the risk involved in revealing information that could lead to a loss of esteem or to a threat of embarrassment to the discloser (White, 2004). When conceptualized as a behavioral belief, it addresses the extent to which the customer believes that disclosing the elicited information will lead to a loss of esteem or to a threat of embarrassment. In so being, loss of privacy addresses psychological and social harms that could come as a result of disclosing information to virtual advisors.

That customers would be resistant to reveal potentially embarrassing information about themselves is not surprising (Omarzu, 2000). Miller (1996) describes embarrassment as a state of chagrin or abashment resulting from public events that communicate unwanted impressions of one’s self to others (White, 2004). As a result, disclosing socially sensitive information to others inherently involves a threat, whether immediate or anticipated, to an individual’s presented self, resulting from negative evaluations from real or imagined audiences (Dahl et al., 2001; Miller and Leary, 1992). Evaluations of this threat are considered to play a powerful role in regulating social behavior (Modigliani, 1971), including the possible behavior of disclosure avoidance.

Another potential cost of customer self-disclosures that has received significant research attention is loss of privacy. Broadly defined, customers’ concerns for privacy refer to their concerns over who has their personal information, and what is done with it (White, 2004). When conceptualized as a behavioral belief, it addresses the extent to which the customer believes that disclosing the elicited information will lead to a loss of control over who has his/her personal information and how it is handled.

In this study, we choose to focus on loss of privacy rather than information misuse risk, defined as the risk that information revealed would be mishandled or inappropriately used or shared with others (Glover and Benbasat, 2008), for two main reasons. First, loss of privacy is a more general concept. When conceptualized as an expected cost of self-disclosure, loss of privacy refers to the belief that self-disclosure will lead to a loss of control over who has the information disclosed and what is done with it.

Second, privacy loss is a possible consequence of information misuse risk, but can also be affected by other antecedents. Not only could loss of privacy come as a result of deliberate or unintentional information mishandling, but it also could be the result of weak privacy policies or vendor's unethical behavior. When viewed within the context of expectancy theories, loss of privacy symbolizes an outcome that is to be avoided. The motivational score for a behavior that allows for this outcome is a function of three distinct components (Vroom, 1964): 1) expectancy, which refers to the probability assessment that an action (self-disclosing) will result in a certain performance (how information is used and handled), 2) instrumentality, which refers to the subjective assessment that a given level of performance (unethical or incompetent information handling and usage) will lead to a particular outcome (loss of privacy), and finally 3) valence, which refers to the value that an individual places on that outcome (loss of privacy) (Hann et al., 2007).

Customer privacy literature suggests that information sensitivity influences privacy concern (Rohm and Meline, 2004), and subsequently, the risk of loss of privacy (Milne and Gordon, 1993; Phelps et al., 2000). While the risk of loss of face is a risk that can result in social or psychological harm (Mitchell, 1999), loss of privacy risk is mostly functional in nature², and typically results in financial loss. Therefore, the motivation to avoid such risk is derived from the customer's desire for privacy and to minimize unwanted financial harm that could result when such an event occurs (Awad and Krishnan, 2006).

In light of the above analysis, we make a general hypothesis in regards to the negative effects of perceived costs of disclosure on self-disclosure intentions. While potentially many

² Needless to say, loss of privacy can involve the unauthorized sharing of information with others. This could cause social or psychological harm, possibly as a result of stress, negative evaluations from others, or depending on the nature of the information shared, social disapproval.

different costs are likely to be perceived, our view (based on extant research) is that the two discussed above will be most salient.

H1: Perceived costs of disclosure negatively influence the intentions to self-disclose.

In addition to forming beliefs regarding potential costs of self-disclosure, customers will form beliefs about the benefits that can be obtained as a result of providing the elicited information to the virtual advisor. In their investigation of potential benefits that can be obtained through disclosing personal information to websites, Hui et al.'s (2006) highlighted the important role of both extrinsic and intrinsic benefits. Per their conceptualization, intrinsic benefits are ends in themselves to customers, and can motivate consumer behavior because they appeal to the desire of consumers for specific types of experience (e.g., enjoyment). Alternatively, extrinsic benefits are those benefits that provide means with which consumers can fulfill other goals, external to the act of self-disclosing itself (e.g., monetary rewards, convenience)³.

2.3.1.2 Perceived Benefits: Performance Expectancy and Social Adjustment

Of the many factors affecting intentions to use a virtual advisor, the extent to which the advisor enhances a customer's shopping performance has been shown to be most significant (e.g., Al-Natour et al., 2006; Wang and Benbasat, 2005). In fact, protocol analysis has shown that users of virtual advisors form performance expectations even prior to using these aids (Komiak and Benbasat, 2008). Typically, from a customer's perspective, using a virtual advisor is limited to providing inputs and deciding what to do with the provided outputs (Xiao and Benbasat, 2007). When these inputs are being elicited in the form of requests for self-disclosure, then customers will likely 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 perceived performance

³ The desire for extrinsic benefits could further explain the existence of the privacy paradox, where people were observed to disclose more than they said they are willing to. As suggested by Austin Hill, the founder of Zero-knowledge, if you "ask 100 people if they care about privacy and 85 will say yes. Ask those same 100 people if they'll give you a DNA sample just to get a free Big Mac, and 85 will say yes." (as quoted in Zhan and Rajamani, 2008).

expectancy of self-disclosure as the extent to which the customer believes that disclosing the elicited information will help him/her attain benefits in terms of task outcomes. These beliefs in regards to 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 and/or her actual disclosure behavior (Kam and Chismar, 2003). As with the perceived cost of privacy loss, performance expectancy benefits are functional (Glover and Benbasat, 2008) and extrinsic in nature.

Potential benefits that can be attained through self-disclosures to online virtual advisors are not limited to those that are utilitarian or extrinsic in nature. Another potential benefit of self-disclosures to online vendors that has received some research attentions is social adjustment (Lu, Tan, and Hui, 2004). This psychological benefit refers to the potential for gaining social approval and adhering to social norms through self-disclosing (Hui et al., 2006). When conceptualized as a behavioral belief, it addresses the extent to which the customer believes that disclosing the elicited information will help him/her gain social approval and adhere to social norms.

Driven by the need for affiliation, a key force driving human behavior (Maslow 1970), people may use self-disclosure as means with which to form and/or strengthen relationships (Baumeister and Leary, 1995; Vittengl and Holt, 2000). Affiliation has been defined as one's tendency "to form friendships and associations, to co-operate and converse sociably with others" (Murray 1938, p. 174). It is a need that is sought for a number of reasons, including: 1) obtaining gratification as a result of harmonious relationships and a sense of togetherness, which subsequently evokes positive stimulation (Murray, 1938), 2) enhanced feelings of self-worth as a result of the attention they receive from others (Atkinson et al., 1954), and 3) comparison with reference groups that helps to reduce social ambiguity (Moschis, 1974).

As a result, the extent to which this benefit of social adjustment is believed to come as a result of providing the elicited information, will affect the intentions to, and the extent to which, the information is provided.

H2: Perceived benefits of disclosure positively influence the intentions to self-disclose.

2.3.2 Relational Antecedents to Customer Self-Disclosure

One of the most significant criticisms directed at social exchange theory is that it reduces human interaction to a purely rational process (Miller, 2005). A similar criticism has also been echoed in relation to the study of self-disclosures as solely a function of rewards and costs (Antaki et al., 2005). More than an evaluation of rewards and costs, the decision to self-disclose involves an assessment of the characteristics of the discloser and the target of disclosures, the relationship with that target, as well as the context in which these disclosures occur (Mikulineer et al., 1991; Omarzu, 2000). In this study, we focus on the effects of two relational factors on self-disclosure intentions. Specifically, we propose that interpersonal trust and perceptions of relational interdependence exert significant influences on customers' disclosure intentions.

Research in management has differentiated between different forms of trust (Rousseau, Sitkin, Burt, and Camerer, 1998). Deterrence-based trust emphasizes the role of sanctions in ensuring that the trustee is not opportunistic. Calculus-based trust is driven by rational choice, in which trust is formed based on credible information regarding the intentions or competence of the trustee. Relational trust is based on information from within the relationship itself, where previous interactions shape the expectations about the trustee's intentions. Thus, unlike calculus-based trust, relational trust is dynamic and depends on the nature, length, and frequency of past interactions, allowing for other considerations, such as emotions, to play a role. Finally, institutional-based trust emphasizes the role of institutional factors, such as structural conditions, that are needed to enhance the probability of a successful outcome. It can ease the way to formulating both calculus-based and relational trust.

The variety of forms that trust in a particular target can take, and the possibility that this trust is a mix of several forms together has been well-recognized in literature (Schoorman, Mayer, and Davis, 2007). In fact, Rousseau et al. (1998) assert that "conceptualizing trust in only one form in a given relationship risks missing the rich diversity of trust in organizational settings." (p. 401) In the context of this study, we conceptualize a customer's trust in a virtual advisor to be a mix of calculus-based, relational, and institutional trust. At early stages of the customer-advisor interaction, the customer will likely depend on available institutional

structures to assess her level of protection from negative consequences of self-disclosures. Also, the customer will likely use all available relevant cues to form an initial assessment of the trustworthiness of the virtual advisor in the form of a calculus-based trust. Yet, as the interaction progresses, or over a number of interactions, the customer receives more information from within the relationship itself. For example, after answering a question, the customer could receive responses from the virtual advisor that are caring and understanding. Such information will facilitate the development of relational trust. Given that sensitive disclosures inherently involve emotional risk-taking, relational trust developed based on interaction experiences is proposed to play an important role in inducing the customer to take such emotional risks, since these past interactions could lead to the formation of attachments based upon interpersonal care and concern (McAllister, 1995). Therefore, consistent with Al-Natour and Benbasat (2009), we conceptualize trust mainly as a type of relationship beliefs, and in so doing, we focus on relational trust formed on the basis of beliefs formed during the interaction experiences.

In terms of conceptualization, research has differentiated between trusting beliefs (trustworthiness) and trusting intentions. Trust as a belief addresses the trustor's perception that the trustee has attributes that are beneficial to the trustor (McKnight, Choudhury, and Kacmar, 2002a). Specifically, it refers to the extent to which the trustor believes that the trustee has competence (the ability, skills, and expertise to perform effectively), benevolence (cares about the trustor and acts in the trustor's interest), and integrity (adheres to a set of principles that the trustor finds acceptable) (Mayer, Davis, and Schoorman, 1995; McKnight et al., 2002a; 2002b; Wang and Benbasat, 2005). Trusting intentions, on the other hand, refer to the trustor's willingness to depend on the trustee (be vulnerable) and engage in trusting-related behavior (McKnight et al., 2002a). These trusting-related behaviors could be any of many actions that demonstrate dependence on the trustee, that make one vulnerable to the trustee, or increase the trustor's risk (Mayer et al. 1995).

The effect of trust on self-disclosure intentions and behaviors has enjoyed a plethora of research attention in psychology (Mount, 2005). Generally, it has been suggested that since self-disclosure involves significant risk-taking, emotional or otherwise, a sense of trust is important for the discloser to feel comfortable in a relationship (Pearce, 1974). This assertion

was supported by Wheelless and Grotz (1977), who conceptualized trust as “a process of holding certain relevant, favorable perceptions of another person which engender certain types of dependent behaviors in a risky situation where the expected outcomes that are dependent upon that other person(s) are not known with certainty.” (p. 251) They suggested that sufficient levels of trust maybe a prerequisite to self-disclosure but not a guarantee of it. This conclusion was further confirmed by Steel (1991) and Wheelless (1978), who showed that varying degrees of disclosure are related to varying degrees in perceptions of trustworthiness (the association was strongest between individualized trust and the amount, depth, and accuracy dimensions of self-disclosure).

Customer self-disclosure to online vendors has been proposed as a meaningful trust-related behavior (McKnight et al., 2002b). Determining that behavior are the customer’s intentions to self-disclose, which are partially shaped by the beliefs the customer holds regarding the vendor’s trustworthiness. This latter assertion has received much research support, where trust has been shown to act as a risk-coping mechanism (Cho, 2006; Olivero and Lunt, 2004) that increases willingness to provide personal information (e.g., Hoffman, Novak, and Peralta, 1999; Schoenbachler and Gordon, 2002) and reduces privacy concerns (Milne and Boza, 1999).

Depending on the intimacy level of self-disclosures, the need for trust might be reduced or amplified. Relative to disclosing non-sensitive information, disclosures of health and financial information can result in many unique risks. This is manifested in greater customer resistance to making such disclosure (Phelps et al., 2000), consequently increasing the need for trust. In addition, when seeking advice on health-related issues, the customer is inherently taking more risk, since the consequences of following erroneous advice are more costly, and the quality of such advice is difficult to evaluate (Lou and Najdawi, 2004).

In the context of this study, we propose that customers’ intentions to self-disclose and their self-disclosing behavior, are influenced by their overall beliefs in the virtual advisor’s trustworthiness. Specifically, a customer with high trusting beliefs perceives the virtual advisor to have attributes that enable the customer to be vulnerable and engage in the risky behavior of self-disclosure. This is driven by the fact that these beliefs embody assurance that

the advisor will not engage in behavior that can harm the customer as a result of these disclosures, and further has the competence to ensure that such harm does not occur unintentionally (McKnight et al., 2002a).

H3: Trust in the advisor positively influences the intentions to self-disclose.

Another relationship variable examined in this study is interdependence. Interdependence concerns the extent to which the interacting entities influence one another's experiences (Rusbult and Van Lange, 1996). It can be further decomposed to four components addressing: 1) the level of dependence: the degree to which an individual relies on an interaction partner, in so much as his/her outcomes are influenced by the partner's actions, 2) the mutuality of dependence: the extent to which two people are equally dependent on one another, 3) the basis of dependence: the way partners affect one another's outcomes, i.e., whether outcomes are controlled by the partner's actions or joint action, and 4) the covariation of interests: the degree to which partners' interests correspond (Rusbult and Van Lange, 2003). Variation in any of these components can affect the extent to which the relationship between interacting partners is said to be interdependent.

In their interaction, the customer has a certain level of dependence on the advisor. Essentially, as with all dependence situations, the customer is "relying" or "needing" the advisor, and her self-disclosures make her vulnerable, since there is no guarantee that the advisor will employ his power in a prosocial manner (Rusbult and Van Lange, 2003). On the other hand, the advisor depends on the customer to provide the solicited information, and to answer truthfully so it can accomplish its objectives of assisting the customer. Hence, these two entities are involved in an interdependent relationship that could be described in terms of three of the four components listed above, namely, level of dependence, basis of dependence, and covariation of interest. Although, the customer's perceived level of the mutuality of dependence with the virtual advisor can be influenced by the extent to which she believes the inputs provided by her are necessary for the advisor to produce a recommendation (i.e., the importance of disclosing the elicited information), this mutuality of dependence is confounded by the other three components (e.g., the extent to which providing or not

providing the information elicited gives the customer power in the relationship depends on the importance placed on getting a recommendation, i.e., level of dependence).

A customer's perceived *level* of dependence on a virtual advisor is based on her belief in the extent to which she is reliant on the virtual advisor to produce the desired outcomes of their interaction, such as, the extent to which the benefits and costs of disclosures are manifested, and the nature of these benefits and costs. To what degree the customer believes that these outcomes will be obtained through joint or unilateral action will determine the customer's perceptions in regards to the *basis* of that dependence. Alternatively, the degree to which the customer believes that her goals and those of the advisor's are congruent will form the basis for her perceptions of the covariation of interest in that dependence relationship.

In general, higher levels of *interdependence* have been shown to increase the willingness to self-disclose (Altman and Haythorn, 1965). When self-disclosing, individuals make themselves susceptible to a number of vulnerabilities, which are reduced to the extent that dependence is rendered mutual (Rusbult and Van Lange, 2003). When interests covary, the benefits to be gained from opportunistic behavior based on exploitation of another's self-disclosures are minimized, and self-disclosures can act to solidify the "us" stance. Therefore, covariation of interests acts to encourage self-disclosures. When the dependence is characterized by joint action, then the threat of retaliation and non-cooperation becomes a deterrent for the exploitation of self-disclosures and as a result, self-disclosures are expected to increase. Hence, self-disclosure is expected to be more prevalent in interdependent relationships categorized by joint control versus unilateral basis of dependence. Finally, when the level of dependence is reduced so that the advisor actions have minimal effects on the outcomes of the interaction, then self-disclosures become less risky and exploitation becomes less probable. In other words, reduced partner control also reduces the vulnerability resulting from additional self-disclosures, and thus, does not inhibit them.

The effects of interdependence on self-disclosure can also be analyzed within the context of power. Dependence and power are inextricably related and enjoy an inversely proportional relationship; the more dependence (and hence, lower *interdependence*) on another person makes that person more powerful in the relationship. In the absence of any differences in

status, perceptions of another's power reduce the willingness to disclose (Cozby, 1973; Kounin, Polansky, Biddle, Coburn, and Fenn, 1956), especially when these disclosures can result in negative evaluations (Slobin, Miller, and Porter, 1968). It could be that disclosures to powerful others are perceived to deepen the already present level of vulnerability, and/or less powerful disclosers have little ability to sanction more powerful disclosure recipients when they exploit it. Hence, we propose that increased levels of *interdependence*, and thus decreased levels of the customer's dependence on the advisor, will reduce the power differential in their relationship, and consequently will not act to inhibit self-disclosures. Alternatively, reduced level of interdependence, and therefore increased dependence of the customer on the advisor, will reduce the customer's willingness to self-disclose as the customer attempts to preserve power in their relationship.

H4: Perceived interdependence positively influences the intentions to self-disclose.

2.3.3 The Role of Object-Based Beliefs

As described earlier, in addition to being a function of rewards and costs, self-disclosure is a situated interpersonal 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). As Omarzu (2000) argues, disclosure is an interpersonal behavior that is often encouraged or influenced by the actions of others and is situated as a practice in interaction.

Although it has early been 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 (Mount, 1980). Two of the characteristics that have received some research attention are gender (e.g., Brodsky and Komarides, 1968) and status (e.g., Slobin et al., 1968). Alternatively, providing positive feedback or evaluation (e.g., Colson, 1968) and self-disclosing (e.g., Ehrlich and Graeven, 1971) on the part of the target were two behaviors that were shown to increase self-disclosures.

While early attempts have focused on examining the role of target characteristics and behaviors independently of those of the discloser, some studies have looked at both the

discloser and the target in tandem. A major feature of self-disclosure is its flexibility, reflecting the importance of attending to situational cues and adapting one's disclosing behavior (Mikulincer and Nachshon, 1991). Consequently, self-disclosure depends on the nature of the interaction and the relationship in which it occurs. This proposition in regards to the importance of the interaction structure has received research support. For instance, an examination of the extent to which self-disclosure reciprocity is the result of individual effects (i.e., the result of individual tendency to reciprocate) or alternatively, the result of dyadic effects (i.e., effects unique to each dyad), has concluded that self-disclosure is rooted in specific relationships (Miller and Kenny, 1986). A similar conclusion was offered by Snell (1989), who found that gender match/mismatch between the discloser and the target affects the willingness to disclose. Similarly, Swensen and Nelson (1967) provided evidence that while a match on some personality dimensions between the discloser and the target can lead to more self-disclosures, a mismatch on certain dimensions can cause the reverse effect.

This study examines two types of beliefs addressing characteristics and behaviors of the virtual advisor (target of disclosures). First, we investigate the effects of *responsiveness* and *rapport*, two beliefs that address characteristics of the virtual advisor as an interaction partner, and thus, we refer to them as interaction-level beliefs. These two beliefs have been shown to affect the dynamics of interpersonal interactions. Second, we investigate the role of two additional beliefs, namely transparency and expressiveness, on the behavioral and relationship beliefs already discussed, as well as on the two interaction-level beliefs of responsiveness and rapport. Both transparency and expressiveness address inherent characteristics of the target (i.e., the virtual advisor), and therefore, we term them individual-level beliefs.

2.3.3.1 Interaction-Level: Rapport and Responsiveness

The social psychology literature recognizes both responsiveness and rapport as two primary determinants of self-disclosure (Reis and Shaver, 1988). In this section, an overview of these two constructs is provided as well as their hypothesized effects.

Since the development of the social penetration theory (Altman and Taylor, 1973), which concerns the procedural aspects of relational development, self-disclosure has been closely

tied to responsiveness as two components of intimacy. More specifically, intimacy has been considered as “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 a communication from that partner that is perceived to be 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 main types of responsive behavior, namely reciprocating disclosures and appraisal of revealed information. Morton (1978) suggested that when responding to another’s self-disclosure, the respondent can provide: 1) descriptive responses, where the respondent reveals intimate facts in response to those provided by the discloser, 2) evaluative responses, where the respondent acknowledges the affect contained in a discloser through the expression of strong emotions or judgments, and 3) topical responses, where the respondent addresses the same topic brought up by the received disclosure. Of these three types of responses, the first type constitutes what typically has been termed as disclosure-reciprocity, while the last two types of responses concern appraisals of the disclosure received (Berg and Archer, 1982).

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 responsiveness 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). Other studies (e.g., Taylor et al., 1969) have shown that *positive* evaluations of others’ disclosures can encourage more subsequent disclosure than negative or neutral evaluations.

In general, disclosers are more likely to perceive a target as responsive when her 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).

The related construct of empathy, which refers to the ability of accurately inferring another person's feeling and responding compassionately to another's distress (Ickes, 1993), has also been recognized as an important phenomenon in interpersonal communication. Ickes (1993) recognized two main elements of empathy. The first is empathic accuracy, which refers to the ability to accurately infer other people's thoughts and feelings, and the second is supportive response, which refers to responding compassionately to another person's distress (Coke et al., 1978). When investigated within the context of computer-mediated communication, namely text-based instant messaging, it was shown that both empathic accuracy and response type have significant effects on online interpersonal trust (Feng, Lazar, and Preece, 2004). Similarly, empathetic responses received from computer simulated human conversational style were shown to affect enjoyment of, and interest in interactions (Peiris and Alm, 2000).

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), and the related construct of empathy (e.g., Ickes, 1993), we view the construct of 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 example, 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 submit, is that

concerned responses demonstrate responsiveness at two levels. First, concerned responses indicate willingness on the part of the target to tailor the exchange to the issue at hand, and thus, increase the proportion of content-related statements included in a reply (see Davis and Perkowski, 1979, for a detailed discussion of the role of content-related responses on self-disclosure). Second, in addition to providing more content-related quality, concerned responses express evaluative intimacy as they involve the expression of emotions and/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, validating responses increase the discloser's willingness to disclose more about themselves, for a longer period of time, while providing more intimate information (Colson, 1968; Taylor et al., 1969).

H5: Perceived responsiveness positively influences the intentions to self-disclose.

An important dimension of perceived responsiveness is projecting awareness and understanding of the discloser's needs and concerns. In the context of customers' disclosures to virtual advisors, this serves to demonstrate that the advisor understands what the customer considers important, and thus, has the sufficient prerequisite knowledge of the customer's needs to recommend a suitable product. Therefore, perceived advisor responsiveness strengthens the customer's belief that her shopping performance will be enhanced as a result of revealing the elicited information. This is mainly because responsiveness demonstrates that not only does the virtual advisor understand the customer's needs, but is also motivated to find a suitable product. Such perceptions that the advisor has internalized the customer's needs have been shown to enhance evaluations of the advisor and the customer's desire use it (Komiak and Benbasat, 2006).

Alternatively, care and validation can strengthen the customer's belief in regards to the social adjustment benefits of self-disclosing. As described earlier, social adjustment refers to the potential for gaining social approval and adhering to social norms through self-disclosing. By

manifesting care and concern, and more importantly, by confirming that the customer is an accepted and valued individual, the virtual advisor essentially, is communicating social approval and confirming that the customer does in fact adhere to social norms.

H6: Perceived responsiveness positively influences perceived disclosure benefits.

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 this information can cause. Thus, perceptions of a caring virtual advisor can lead to reduction in the customer's belief in privacy loss risk.

Validation, on the other hand, can function to reduce the customer's perceptions of the potential for embarrassment that could result from her self-disclosures. Assuring the customer that he/she is a valued individual and that others are in a similar situation, reduces the perception that what is being disclosed is to be ashamed of.

H7: Perceived responsiveness negatively influences perceived disclosure costs.

As discussed earlier, a distinction is to be made between calculus-based and relational trust. While the first uses second-hand information in a process of impression formation, the second is based on information obtained from interactions with the trust object. In the most general sense, responsiveness is a belief that captures information about the virtual advisor as an interaction partner. In so being, this belief about the advisor's responsiveness represents the customer's level of familiarity with some pertinent aspects of the virtual advisor, such as how well it understands the customer's needs and concerns, and how it feels towards the customer, her concerns and needs. This familiarity then serves as an appropriate context to interpret the virtual advisor's other behaviors (Luhmann, 1979). At minimum, it lessens confusion about some of the advisor's intentions, and subsequently, reduces the possibility that the customer will mistakenly sense that he or she is being taken advantage of (Gefen et al., 2003).

In summary, perceived responsiveness on the part of the virtual advisor acts as trust-relevant knowledge that is accumulated throughout the interaction. Specifically, when the virtual advisor communicates an accurate understanding of the customer's needs and concerns, it strengthens the customer's belief that the advisor has the competence to understand these needs, and subsequently, use them as inputs for the decision process. Portraying responsiveness through manifesting care and concern on the part of the advisor, conversely, strengthens the customer's belief in the advisor's benevolence. Essentially, benevolence is behaviorally marked by caring about the trustor and acting in the trustor's interest (Mayer et al., 1995). By communicating care for the customer when self-disclosing sensitive information, the advisor is invariably communicating general concern for the customer's welfare.

H8: Perceived responsiveness positively influences trust.

An important dimension of perceived responsiveness in addition to projecting awareness and understanding of the discloser's needs and concerns is manifesting that these needs and concerns have been internalized. The internalization of customers' needs and concerns has been shown to affect trust in virtual advisors (Komiak and Benbasat, 2006), as has the projection of empathy in counseling settings (Ickes et al., 1990). We further propose that perceived responsiveness will enhance perceptions of interdependence through strengthening perceptions of covariation of interest and cueing a joint basis for that dependence. First, by communicating understanding of, and care for customer's needs and concerns, the advisor is not only highlighting its comprehension of the customer's "interests", but is also indicating its intentions to protect and care for these interests. Second, by projecting care for these interests, the advisor is in essence allowing for the customer's needs and concerns to impel the final outcome. In doing so, it is enhancing the customer's perception of the extent to which these needs are instrumental in determining the final outcome, and thus, enhancing perceptions that these outcomes are determined through joint action.

H9: Perceived responsiveness positively influences perceived interdependence.

Most definitions of rapport include in their descriptions the feeling of being "in sync" with the interaction partner (Thompson and Nadler, 2002). For instance, Tickle-Degnen and

Rosenthal (1990) suggest that people experience rapport when they “click” with each other or feel the good interaction is due to “chemistry” (p. 286). As a construct, rapport has been investigated by scholars in many contexts including educational settings, roommate relationships, psychotherapist-client interactions, and business transactions (Gremler and Gwinne, 2000). In this latter context, rapport has enjoyed a variety of conceptualizations. For instance, Ashforth and Humphrey (1993) define rapport between a customer and a service provider as “a sense of genuine interpersonal sensitivity and concern” (p. 96), and propose it as a key driver of good service. Alternatively, LaBahn (1996) defines it as the customer’s perceptions that as the perception that a relationship has the right “chemistry” and is enjoyable, and suggest it to be determined by the perceived level of *cooperativeness* and *diligence*. Gremler and Gwinne (2000), on the other hand, see it as a multi-dimensional construct that includes enjoyable interaction and personal connection as its two facets, which they propose to exert effects on customer satisfaction and loyalty intentions.

In this study, we adopt Tickle-Degnen and Rosenthal’s (1990) conceptualization of the rapport construct. They propose that perceived rapport has the three interrelating dimensions of: 1) *attentiveness*, which refers to feelings of attention, focus, and involvement, 2) *positivity*, which refers to feelings of friendliness, warmth, and caring, and 3) *coordination*, which refers to feelings of balance and harmony. Therefore, we define it as the customer’s perception of being in-sync with the advisor, and of the degree to which her interaction with the advisor is marked by harmony, conformity (Bernieri et al., 1996), and positivity (Drolet and Morris, 2000).

Despite the conceptual suppleness with which the rapport construct has been dealt, it has in one form or another been linked to a variety of consequences and antecedents. For example, coordination, which refers to the degree to which interacting individuals are able to align their behaviors with one another spontaneously in an efficient and effortless manner (Finkel et al., 2006), affects whether an interaction is perceived as high/low maintenance. Positivity, on the other hand, which is said to have a declining effect on rapport as relationships develop and mature (Tickle-Degnen and Rosenthal, 1990), is often discussed in relation to non-verbal behavioral cues, such as, smiling and eye contact (Henrdick, 1990). Finally, perceived attentiveness was shown to be influenced by a number of non-verbal cues, such as, forward

leaning and head nodding, as well as a number of verbal cues, such as tone (Nickels et al., 1983) and verbal resonance (Gremmler and Gwinne, 2000).

In this study, we propose that perceived rapport has both direct and indirect positive effects on customers' self-disclosure intentions. Firstly, as a situated interactional practice, self-disclosure is affected by relational and situational cues, and is therefore, influenced by the extent to which the discloser perceives the relationship to be harmonious and conflict-free. The liking of another, or the personal connection one feels towards another, are markers of relationship growth and well-penetrated interactions (Altman and Taylor, 1973; Cozby, 1973). The perceived involvement and focus on the part of the target of self-disclosures, combined with a feeling of friendliness and warmth can function as positive reinforcement that induces additional self-disclosures. Additionally, these perceptions of harmony and personal connection enhance one's desire and incentive to maintain and grow this relationship through additional self-disclosure. Conversely, coordination can serve to enhance perceptions that the disclosures made are appropriate and will be given due care.

At this point, it is important to highlight that the relationship between rapport and self-disclosure has been proposed to be iterative. While perceptions of rapport can enhance feelings of affiliation and connection, thus encouraging self-disclosures, disclosing personal information to another in itself can help to increase perceptions of personal connection (Gremmler and Gwinne, 2000). This has led some to go as far as proposing that self-disclosure is an additional component or source of rapport (Argyle, 1990).

H10: Perceived rapport positively influences the intentions to self-disclose.

In addition to inducing self-disclosure on the part of customers, perceived rapport can affect beliefs in regards to the benefits and costs of these disclosures. In essence, high rapport exists when two or more individuals have a harmony of thought or feeling or common understanding (Crook and Booth, 1997). The perception of a highly coordinated interaction strengthens the customer's belief that the information provided will be properly incorporated into the decision making, thus, enhancing perceptions of performance expectancy. Similarly, when the advisor is perceived to be attentive and involved in its interaction with the customer, it will strengthen the customer's belief that the needs and concerns communicated

through self-disclosure will be internalized and sufficiently taken into account. Perceived positivity of the virtual advisor, on the other hand, increases the prospect of gaining social approval and adjustment as well as the customer's desire to strengthen her affiliation with the warm and friendly advisor.

Alternatively, when an advisor is perceived to be attentive, friendly and warm, it reduces perceptions that the advisor will intentionally cause harm to the customer. Thus, reducing the perceived likelihood that privacy loss will result from self-disclosure. Conversely, perceived friendliness and warmth on the part of the advisor can act to reduce the belief that the disclosed information is something to be embarrassed about.

H11: Perceived rapport positively influences perceived benefits of disclosure.

H12: Perceived rapport negatively influences perceived costs of disclosure.

Finally, rapport is also proposed to affect the customer's perceptions of interdependence and advisor trustworthiness. While coordination acts as an indication of competence, attentiveness and positivity can serve as trust-relevant knowledge strengthening the belief in regards to the advisor's benevolence. This effect of rapport on trust has been previously observed in the literature (LaBahn, 1996; Weitz et al., 1992). Similarly, since perceived high coordination entails the view that the interaction is harmonious and balanced, it serves to emphasize that both interests covary. As a result, the extent to which covariation of interest manifests in higher interdependence will depend partially on how the behaviors of those involved are coordinated. This relationship between coordination and interdependence has been discussed in detail in Rusbult and Van Lange (1996). They suggest that when interests covary, interdependence "entail coordinating in such a manner as to enjoy the good outcomes that are readily available to the pair." (p. 352)

H13: Perceived rapport positively influences trust in the virtual advisor.

H14: Perceived rapport positively influences perceived interdependence.

2.3.3.2 Individual-Level Beliefs: Expressiveness and Transparency

In addition to the two interaction-level beliefs of responsiveness and rapport, the study examines the effects of perceived advisor transparency and expressiveness. These two beliefs are proposed to act as antecedents to the behavioral and relationship beliefs previously overviewed.

Transparency in the context of decision support systems has been proposed to increase users' understanding by offering insights into how the system works (Cramer et al., 2008). While a multitude of prior research has recognized the role of transparency as means to improving users' interaction with decision support aids, perceived transparency has rarely been explicitly measured or pertinently defined. Two exceptions have been the works by Sinha and Swearingen (2002) and Cramer et al. (2008), in which transparency was measured and used to predict trust in virtual advisors. In these studies, transparency has been defined as the extent to which the user understands why a certain recommendation is offered.

While such early attempts to conceptualize the construct of perceived transparency are commendable, we believe these conceptualizations suffer from two main issues. First, in both studies, transparency was defined as a characteristic of the recommendation offered by the virtual advisor, rather than a characteristic of the virtual advisor itself. It is our opinion that transparency relates to the *process* that underlies the virtual advisor's inner workings, rather than the recommendation, which constitutes the output of this process. Second, unlike prior conceptualizations, we do not view understandability as an essential component of perceived transparency. While transparency aims to increase understanding of the inner workings, it does not necessary imply that the user understands the process underlying the advisor's processing, but is rather made aware of it. This distinction between "understanding" and "knowing" is important, since the first may require a certain level of domain knowledge.

In this study, we focus on users' perceptions of the transparency of the virtual advisor, and define perceived transparency as the extent to which the inner workings of the virtual advisor are *known* to the customer. This conceptualization of transparency focuses on the processes followed by the virtual advisor to solicit inputs, process them, and produce recommendations. Therefore, this view of transparency is more general in that the

transparency of a virtual advisor is not only assumed to afford the user an insight into why a recommendation is made, but also could make the user aware of why a certain question is being asked, and how responses will be used and processed, to mention a few. We further propose that transparency is multi-dimensional, and focus on the two sub-dimensions of transparency that concern knowing *why* information is being solicited (purpose transparency), and knowing *how* the information solicited will be used (process transparency).

Transparency implies that the inner workings of the virtual advisors are made known to the user. This includes the communication of how the virtual advisor processes the inputs from customers, and how these are incorporated into the final recommendations. In other words, a transparent advisor allows the user to understand the way it works and explains system choices and behavior (Cramer et al., 2008), thus ensuring that the customer provides suitable inputs and interacts with the advisor appropriately. When a user has an inaccurate mental model of how the advisor works, he or she may provide inappropriate feedback to the advisor (Waern 2004), which will diminish the benefits that can be attained from its use. Thus, an advisor's transparency can affect the actual and perceived benefits customers receive from their interaction with it.

On the other hand, transparency endows customers with additional knowledge on which to form their beliefs regarding what the advisor does, and how it does it. This information can act to affect the perception that a certain outcome will come as a result of providing the solicited information, such as affecting the customer's subjective probability of the performance expectancy benefits from their self-disclosure. When other factors are kept constant, increased transparency is expected to exert a positive effect on perceived self-disclosure benefits. Specifically, providing an insight into the advisor's inner working helps in justifying why certain information is being solicited, and how that information will affect final recommendations. In so doing, increased transparency enhances perceptions of performance expectancy. On the other hand, offering insights into the advisor's inner workings and mental model in itself can be viewed as an affiliative behavior. Particularly, by disclosing information regarding its reasoning, the advisor is in effect strengthening its relationship with the customer through self-disclosure (Baumeister and Leary, 1995; Vittengl

and Holt, 2000). This will heighten the extent to which the customer will perceive that she has to adhere to social norm and self-disclose the solicited information (Hui et al., 2006).

At this point, it is important to note that the effects of increased transparency on perceived benefits are contingent on the quality of the advisor's reasoning. If the advisor is ill-designed, additional insights into its inner workings may have a detrimental effect on the perceived benefits of self-disclosure. For instance, it is possible that through transparency the customer perceives that the solicitation of certain information is unwarranted, such as when information is being solicited but not effectively used. In such a case, transparency can exert a negative effect on perceived disclosure benefits. Nonetheless, when holding everything else constant, a well-designed virtual advisor that offers additional insights into its processing is expected to exhibit more benefits than a similar advisor that is less transparent.

H15: Perceived transparency positively influences perceived disclosure benefits.

Similarly, when the inner workings of the virtual advisor are known, the user will be in a better position to assess the costs of her self-disclosures. For instance, describing how the information solicited will be used to arrive at a recommendation, in addition to highlighting the need for that information, presents and primes the customer with a valid use of that information. Holding everything else constant (i.e., the extent to which the advisor is deceptive and ill-intentioned), this increased knowledge eliminates some of the uncertainty about how information is handled and used, thus, reducing the perceived loss of privacy cost. Conversely, presenting the customer with instrumental uses of the solicited socially sensitive information lowers the extent to which disclosing that information is perceived to be unnecessary and embarrassing. Therefore, the transparency of a virtual advisor lowers the perceived cost of loss of face.

H16: Perceived transparency negatively influences perceived disclosure costs.

Many studies have discussed the role of the transparency of a virtual advisor as an influential antecedent to customers' trust in it. Whether the advisor's perceived transparency was explicitly captured (e.g., Cramer et al., 2008) or not (e.g., Wang and Benbasat, 2007), transparency has been proposed to reduce the information asymmetry between the customer

and the advisor. As proposed by Al-Natour et al. (2011), in the case of virtual advisors, this information asymmetry can relate to: 1) what the advisor does, 2) how it does it, or 3) why it does it. Transparency of a virtual advisor can help reduce these three types of knowledge-gaps, and subsequently, holding everything else constant, increase customers' trust in the advisor. More specifically, communicating what the advisor does and how it is done can be used to demonstrate its expertise, subsequently increasing perceptions of its competence (Wang and Benbasat, 2007). Providing justifications as to why the advisor is doing something, alternatively, can help bridge the "intentions gap" that may arise as a result of customers' unawareness of why certain information is being solicited. Bridging this gap through transparency will convey goodwill toward customers, which will enhance their perceptions of the benevolence (Wang and Benbasat, 2007). Finally, providing descriptions of what's being done, how, and why, collectively, endow the customer with the knowledge to evaluate the principles that the advisor adheres to, and whether these are acceptable from the customer's point of view. Therefore, increased transparency can also facilitate the formation of integrity beliefs.

H17: Perceived transparency positively influences trust.

Increased transparency, in addition to facilitating the formation of trust and trusting beliefs, can also affect perceptions of relationship interdependence with the virtual advisor. Firstly, descriptions of why certain information is solicited and particular actions performed, via bridging the intentions gap between the customer and the advisor, help in affirming goal congruency and covariation of interest. Secondly, transparency in regards to what's being done with the information provided, and how it is being integrated within the decision-making can enhance perceptions that the decision process and its outcomes are the result of joint action of both the customer and the advisor, thus, affecting the perceived basis of dependence. Finally, by offering customers an insight into the advisor's mental model and inner workings, they will be better able to judge the complexity of these inner workings and the overall decision process, subsequently, increasing perceptions as to the extent to which the processing of the advisor is instrumental for achieving desired outcomes, and the degree to which the customer relies on the virtual advisor.

H18: Perceived transparency positively influences perceived interdependence.

As discussed earlier, in addition to being seen as tools that help extend users' cognitive limitations, online virtual advisors act as social partners in interpersonal interactions. Perceived expressiveness is a newly proposed construct intended to capture customers' perceptions of the extent to which a virtual advisor conveys human-like emotions and feelings in its communication with customers. Hence, perceived expressiveness is an evaluation of the advisor's social aptitude and its ability to relate to its users at a human level. In so being, it emphasizes the role of affective and responsive communication.

It is important to note that while expressiveness is similar to social presence, these two are distinct. Social presence refers to the feeling of "being with another" (Biocca et al., 2003), and measures the degree to which a medium allows its users to establish personal connections with other people in distant locations (Short et al., 1976). When applied to the context of virtual advisors, social presence has been adapted to address the extent to which the advisor is perceived as sociable and warm, personal or intimate when *interacting* with it (Gefen and Straub, 2003). Thus, expressiveness could be considered as an antecedent or a facilitating condition for increased social presence.

In this study, perceived expressiveness is proposed to have a positive effect on perceived benefits, and a negative one on costs. First, the expression of feelings and emotions allows for richer and more intimate interactions, in which partners can better relate to one another. This can enhance the perceptions of social adjustment benefits. Additionally, by being more expressive, the advisor communicates more information (more cues) about its intentions and what it understands and will do. This will in turn enhance perceptions of performance expectancy. On the other hand, by manifesting emotions and feelings, the advisor is manifesting vulnerability. In so doing, it is increasing the level of intimacy of the interaction and taking an emotional risk. This can work to reduce perceptions of loss of face and privacy.

H19: Perceived expressiveness positively influences perceived disclosure benefits.

H20: Perceived expressiveness negatively influences perceived disclosure costs.

We also propose that perceived expressiveness exerts a positive effect on trust and the covariation of interests dimension of interdependence. When expressing emotions in response to the actions of a customer, the advisor is essentially expressing its concern for the customer, and conveying its validation. Not only is the advisor communicating that it understands what the customer is “saying”, but also that it cares about the customer and the information the customer reveals. While the first can work to enhance perceptions of the advisor’s competence, the latter can increase perceptions of its benevolence and integrity. Hence, perceived expressiveness is also expected to have a positive effect on trust. In fact, the expression of feelings and emotions in social interactions has been viewed as a type of trusting behavior in and of itself, which consequently, works to enhance perceptions of the trustworthiness of the communicator of these affective responses (Altman and Taylor, 1973).

H21: Perceived expressiveness positively influences trust.

H22: Perceived expressiveness positively influences perceived interdependence.

2.3.4 The Role of Design Characteristics

In this study, we also investigate how the design of virtual advisors can be used to effect perceptions that encourage self-disclosures. Figure 3 highlights the proposed effects of certain design elements on the individual-level and interaction-level object-based beliefs. In determining which design elements to examine, we conducted an extensive analysis of the behavioral markers of each of the desired characteristics, and focused on task-relevant design elements.

As discussed earlier, the focus of this study is on investigating the determinants of customers’ self-disclosure to online virtual advisors within the context of a *typical* interaction. In light of this, it is important that the task characteristics remain constant, and subsequently, the role performed by the virtual advisor. Al-Natour and Benbasat (2009) distinguish between *role* and *process* appropriations of an IT artifact. While the first concerns changes made to the function the artifact performs (e.g., recommender system vs. delegated agent), changes in the process aspects of an artifact’s design concern how it accomplishes the task with which it was endowed. In this study, we focus on design elements that concern process changes to how the virtual advisor fulfills its role as a recommender system.

The remainder of this section offers an overview of some of the design elements that we believe can cue the desired individualistic and interaction-level object-based beliefs.

Explanations: Explanation facilities have long been considered a critical component of intelligent and knowledge-based systems (Dhaliwal & 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 & Benbasat, 1999). Explanation facilities have also been investigated in the context of online virtual advisors. For example, the addition of explanation facilities has been shown to increase users' acceptance of a virtual advisor (Herlocker, Konstan, & Riedl, 2000), and enhance perceptions of the transparency of its inner workings (Sinha & Swearingen, 2002). Wang and Benbasat (2007) have differentiated between two types of explanations offered by virtual advisors. *Why* explanations are used to provide justification for the questions asked and the recommendations provided. *How* explanations describe the line of reasoning used by the advisor and outline the logical processes involved in reaching final recommendations.

In this study, we propose that the use of *why* and *how* explanations will affect a number of the self-disclosure determinants previously discussed. When applied to the context of self-disclosures, *why* explanations communicate the reasons for asking a certain question, and in doing so, they convey the relevance of the solicited information to the decision-making task. Alternatively, *how* explanations express how the information solicited via a certain question will be used and incorporated into the decision-making.

In addition to providing justifications for, and descriptions of, the virtual advisor questions and behaviors, explanations provide customers with guidance and additional information in regards to the decision process and decision context. For example, when providing a justification for why certain information about health conditions is needed, the virtual advisor is invariably communicating some guidance as to the role of health conditions in affecting product choices. Therefore, explanations provided by a virtual advisor can be viewed as types of decisional guidance that can differ in the amount, type, and timing of information offered (Al-Natour et al., 2008).

Decisional guidance was first studied in relation to decision support systems (DSS), and concerns “the *degree to which* and the *manner in which* a system guides its users in constructing and executing decision-making processes, by assisting them in choosing and using its operators” (Silver, 1990, p. 57), and can be divided into *suggestive* guidance and *informational* guidance. Suggestive guidance proposes courses of action to the user, while informative guidance provides users with relevant information without indicating how the user should proceed (Silver, 1990). These types of decisional guidance can be communicated through the following three modes (Silver, 1991): a) *predefined*, in which the designer predefines the particular suggestions and information, b) *dynamic*, in which the suggestions and information are generated by learning dynamically over time, and c) *participative*, in which suggestions and information are generated with the active participation of the decision maker. More recently, Silver (2006) added two new dimensions to his typology of decisional guidance: 1) timing, where guidance can be *concurrent*, *prospective*, and *retrospective*, and 2) invocation style, where he differentiated between *automatic*, *on-demand* and *hybrid* guidance invocation styles.

Integrating these ideas in relation to explanations and their types, and decisional guidance and their characteristics, 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 customers. 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 communication mode 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 elicited, it is only when this how explanation is personalized to the customer’s response will it enhance perceptions of the advisor’s responsiveness (validating and understanding) and rapport (coordination and attentiveness). Nonetheless, regardless of the communication mode, both why and how explanations communicate information about the inner workings of the virtual advisor, and thus, enhance perceptions of its transparency.

Needless to say, the timing and invocation style of both why and how explanations can play a role in how they affect self-disclosure antecedents. In the context of this study, a dynamic how explanation, by virtue of being generated in response to the customer's choice, is retrospective in terms of timing. The predefined how explanation that communicates how in general the answer to a certain question is used is concurrent in terms of timing. While an automatically invoked explanation will understandably enhance perceptions of personal care and coordination more than a one that is invoked on-demand, this study only focuses on explanations that are generated automatically.

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, which in turn affects the "hearer" (Searle, 1969, p. 24). Hence, by uttering the sentence the speaker says something, does something by speaking, and affects the hearer by what is said (Janson et al., 1993). 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 cue perceptions of a virtual advisor's dominance (Al-Natour et al., 2005; 2006), it is proposed that other types of speech acts can be used to effect perceptions of responsiveness, rapport, and expressiveness. More specifically, we propose that expressive speech acts, which are used to express a certain psychological state by the speaker of the message (Janson et al., 1993), such as apologizing or expressing concern, can be used by the virtual advisor to manifest understanding and care, and thus, increasing perceptions of the advisor's responsiveness.

On the other hand, commissive speech acts, which are used to make promises and commitments, can also be used to reaffirm the virtual advisor's commitments. This includes making commissive statements in relation to helping the customer (e.g., making commitments to helping the customer, *or* utilizing the information revealed to find a more

personalized product), and/or reducing the risks involved in revealing personal information (e.g., making commitments to protecting the information).

Verbal Cues: The ability of virtual advisors to manifest a number of verbal and non-verbal cues has received much attention in Human-Computer Interaction (HCI) research (e.g., Cowell and Stanney, 2005). To do so, the advisors are typically given a humanoid embodiment that can range from a simple two-dimensional avatar facial representation (e.g., Al-Natour et al., 2005), to a full-bodied 3-dimensional representation (e.g., Qiu and Benbasat, 2005). In the latter case, a number of non-verbal behavioral cues can be manifested, such as, head nods, hand and body gestures, as well as different facial expressions. This study focuses on the effects of verbal cues on perceptions of responsiveness and rapport. Specifically, we focus on the study of verbal style, which includes the “choice of words and types of sentences and fluidity of speech” (Isbister and Nass, 2000, p. 253). Such verbal cues have been shown to serve as the basis on which users can form perceptions of an automated advisor’s extroversion and friendliness (e.g., Isbister and Nass, 2000; Nass et al., 1995). Consistent with these findings, we propose that verbal cues manifested, namely, verbal style, will affect perceptions of the advisor’s friendliness and warmth, and thus, its perceived positivity, attentiveness, and care. The study reported in chapter 4 examines how non-verbal cues can be used to increase perceptions of the advisor humanness and expressiveness.

2.4 Research Method

A between-subjects experimental study with twelve treatment conditions was used to test the relationships depicted in Figure 3. Participants were randomly assigned (computer randomization) to one of the twelve experimental groups. More details about the experimental procedure, treatment conditions, sample and measures are provided below.

Considering that the objective of this experiment is to create enough variance in the object-based beliefs to enable a test of their effects, there was no need for a full factorial design. The choices of the design elements manipulated were anchored in an analysis of their expected effects, overviewed in section 2.3.4. Based on that analysis, it is clear that the effects of these design elements are not singular or mutually exclusive. In other words, two or more design

elements can work to enhance perceptions of the same characteristic, and the same design element can affect perceptions of a number of characteristics. Therefore, some of the treatment groups involve a manipulation of multiple design elements. Choices regarding the subsets of these elements were driven by an analysis of their complementary effects and a number of pilot studies.

2.4.1 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. 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.

The use of a skin care product context is due to a number of reasons. First, based on past performance and recent forecasts, online sales of health and beauty products have been growing and continue to grow (Mulpuru and Hult, 2010), continuing a trend that has seen them to more than double between 2005 and 2008 (Johnson and Tesch, 2005). This trend is not limited to North America, but extends to other developed countries. In the United Kingdom for example, the latest IMRG-Capgemini eRetail Sales Index showed that health and beauty was a key driver in the overall growth of online sales in the, where the category experienced its largest ever year-on-year growth of 53% (Sillitoe, 2011).

Second, health and beauty products are further 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 the product 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).

After the shopping task, participants were asked to evaluate the virtual advisor and indicate their willingness to disclose the elicited information if they were to use the virtual advisor to shop for themselves.

2.4.2 Sample

The study was conducted on-line using participants recruited from an e-commerce panel maintained by an Internet market research company. 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 that is redeemable for various prizes available through the marketing firm. Given that females have been shown to be the more likely purchasers of beauty products (Reitsma et al., 2007), the sample consisted of 125 females representing a cross section of female Internet users. Noteworthy also is the finding that women, in general, tend to disclose more, especially on intimate and feminine topics (Snell et al., 1988). The subjects' characteristics (age, education, income, marital and employment status) are summarized in 0, and did not differ across the treatment groups.

Table 3. Study 1 Sample Characteristics

	# Participants	Percentage
Age		
19 - 24	6	4.8
25 - 34	25	20.0
35 - 44	29	23.2
45 - 54	29	23.2
55 - 64	27	21.6
65+	9	7.2
Annual Household Income		
No Response	1	0.8
Less than \$30,000	40	32.0
\$30,000 - \$49,999	30	24.0
\$50,000 - \$74,999	28	22.4
\$75,000 - \$99,999	10	8.0
Equal or more than \$100,000	16	12.8
Employment Status		
No Response	1	0.8
Employed full-time	49	39.2
Employed part-time	24	19.2
Retired	23	18.4
Unemployed	28	22.4
Educational Level		
No Response	1	0.8
College or graduate school degree	54	43.2
High school graduate	28	22.4
Not a high school graduate	5	4.0
Some college	37	29.6
Marital Status		
No Response	1	0.8
In a relationship	19	15.2
Married	63	50.4
Single	39	31.2
Widowed	3	2.4

2.4.3 Pilot Testing

Appendix A provides detailed descriptions of three pilot studies that were conducted to inform the design and measurement instrument used in Study 1. Collectively, the three pilot studies have confirmed that the determinants of customer self-disclosures to online virtual advisors extend beyond the perceived benefits and costs of the self-disclosures to include the advisor characteristics and relationship beliefs, and further corroborated the potential for design elements to shape perceptions of the different self-disclosure determinants. Below is a brief description of these pilot studies:

- **Pilot 1:** A partial test of the proposed model was conducted in Pilot 1. Forty-seven subjects were randomly assigned to use one of four advisors that differed in some of the design elements described in this study. New scales were developed to measure perceived responsiveness and rapport. Other constructs were measured using adapted scales. Generally, the results indicated that explanations and speech acts can be used to influence the characteristics manifested by the advisor. An analysis of the structural model revealed that all type of beliefs (behavioral, relationship, and object-based) influence the intentions to self-disclose, which was measured using four items.
- **Pilot 2:** In this study, additional constructs were introduced to the model (interdependence, social adjustment benefits, transparency, and expressiveness). Furthermore, modifications were made to the measurement instrument, and specifically to the scale capturing the intentions to self-disclose (more items added). The script used by the advisor was also significantly revised. An analysis of a number of websites and skin care forums resulted in the identification of twenty-eight questions that can be used to determine someone's skin care needs. In a separate study, subjects rated each question in terms of its: 1) social sensitivity, 2) relevance to skin care, and 3) their willingness to disclose that information if asked by a skin care expert. The results from this study confirmed the relevance of the newly introduced constructs, and the appropriateness of the new script (this script was later used in the main data collection).

- **Pilot 3:** This study constituted a final pre-test of the proposed model. Minor changes were made to the script and the measurement instrument. The results confirmed the adequacy of the advisor’s design and the measurement instrument.

2.4.4 Treatment Conditions

Based on our earlier discussion of the proposed role of explanation facilities, speech acts, and verbal cues in affecting perceptions of the virtual advisor, twelve advisors were designed that either differed from the control condition by one design element, or a meaningful combination of design elements. Table 5 provides a brief description of the protocol followed by each advisor when soliciting information, and depicts screenshots of the advisors used in each of the experimental conditions. Table 4 summarizes the design elements used by each treatment advisor.

Table 4. Study 1 Treatment Advisors and Design Elements												
Design Element	Treatment Advisor											
	1	2	3	4	5	6	7	8	9	10	11	12
Why Explanations		X			X						X	X
How Explanations (static)			X		X						X	X
Commissive Speech Acts (commit to protect information)				X	X						X	X
How Explanations (dynamic)						X			X	X	X	X
Expressive Speech Acts							X		X	X	X	X
Commissive Speech Acts (commit to help customer)								X	X	X	X	X
Extravert Phrasing										X		X

Table 5. Study 1 Screenshots of Treatment Virtual Advisors



<p>Advisor 1 (<i>Question ... Answer Options</i>): The advisor acted as the control condition. It simply asked the question, and then offered a number of options to answer it.</p>	
<p>Advisor 2 (<i>[why explanation] Question ... Answer Options</i>): The advisor provided an explanation justifying the need to ask the question. This was followed by the question itself, and the available options.</p>	
<p>Advisor 3 (<i>Question [how explanation] Answer Options</i>): After the question itself, the advisor offered a description of how the information will be used. This was followed by the options available to answer the question.</p>	

Table 5. Study 1 Screenshots of Treatment Virtual Advisors (continued)







<p>Advisor 4 (<i>Question</i> [commissive speech act] <i>Answer Options</i>): After the question, the advisor used a commissive speech act to express its commitment to safeguard the information solicited. Following, the advisor listed the options for answering the question.</p>	<div style="text-align: center;"> <h3>Canadian Beauty Store</h3>  </div> <hr/> <div style="display: flex; align-items: center;">  <div> <p>Do you smoke?</p> <p>The response provided will be kept confidential.</p> <ul style="list-style-type: none"> <input type="radio"/> Never <input type="radio"/> Rarely <input checked="" type="radio"/> Often <input type="radio"/> Prefer not to disclose </div> </div> <div style="text-align: right; margin-top: 10px;"> <input type="button" value="Next >>>"/> </div>
<p>Advisor 5 (<i>why</i> explanation] <i>Question</i> [how explanation] [commissive speech act] <i>Answer Options</i>): The advisor incorporated the characteristics of advisors 2, 3 and 4. It started with providing 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.</p>	<div style="text-align: center;"> <h3>Canadian Beauty Store</h3>  </div> <hr/> <div style="display: flex; align-items: center;">  <div> <p>Aside from the many health issues associated with it, smoking may age one's skin faster than anything else, possibly apart from sun damage.</p> <p>Do you smoke?</p> <p>The response you provide may help the tool to determine if there is the need to recommend a product that will counter the negative effects of smoking. The response provided will be kept confidential.</p> <ul style="list-style-type: none"> <input type="radio"/> Never <input type="radio"/> Rarely <input checked="" type="radio"/> Often <input type="radio"/> Prefer not to disclose </div> </div> <div style="text-align: right; margin-top: 10px;"> <input type="button" value="Next >>>"/> </div>
<p>Advisor 6 (<i>Question ... Answer Options</i> [how explanation]): 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.</p>	<div style="text-align: center;"> <h3>Canadian Beauty Store</h3>  </div> <hr/> <div style="display: flex; align-items: center;">  <div> <p>Do you smoke?</p> <ul style="list-style-type: none"> <input type="radio"/> Never <input type="radio"/> Rarely <input checked="" type="radio"/> Often <input type="radio"/> Prefer not to disclose </div> </div> <div style="background-color: #f8d7da; padding: 5px; margin-top: 10px;"> <p>The information provided might help the tool decide if it needs to consider products that can counter the negative effects of smoking on one's skin.</p> </div> <div style="text-align: right; margin-top: 10px;"> <input type="button" value="Next >>>"/> </div>

Table 5. Study 1 Screenshots of Treatment Virtual Advisors (continued)



<p>Advisor 7 (<i>Question ... Answer Options</i> [expressive speech act]): 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 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.</p>	
<p>Advisor 8 (<i>Question ... Answer Options</i> [commissive speech act]): 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 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.</p>	

Table 5. Study 1 Screenshots of Treatment Virtual Advisors (continued)









<p>Advisor 9 (<i>Question ... Answer Options [how explanation] [expressive speech act] [commissive speech act]</i>): The advisor incorporated the characteristics of advisors 6, 7 and 8. It 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.</p>	<div style="text-align: center;"> <h2>Canadian Beauty Store</h2>  </div> <hr/> <div style="display: flex; align-items: center;">  <div> <p>Do you smoke?</p> <ul style="list-style-type: none"> <input type="radio"/> Never <input type="radio"/> Rarely <input checked="" type="radio"/> Often <input type="radio"/> Prefer not to disclose </div> </div> <div style="background-color: #f8d7da; padding: 10px; margin-top: 10px; border: 1px solid #f5c6cb;"> <p>I am sorry to hear that. It is often difficult to quit. The information provided might help the tool decide if it needs to consider products that can counter the negative effects of smoking on one's skin. In light of your response, the tool may look for ways to help your skin look fresh and healthy.</p> </div> <div style="text-align: center; margin-top: 10px;"> <input type="button" value="Next >>>"/> </div>
<p>Advisor 10 (<i>Question ... Answer Options [how explanation] [expressive speech act] [commissive speech act] all using extravert phrasing</i>): The advisor was similar to advisor 9. The only difference was that this advisor used extravert phrasing of the question, the answer options, the how explanation and the two speech acts.</p>	<div style="text-align: center;"> <h2>Canadian Beauty Store</h2>  </div> <hr/> <div style="display: flex; align-items: center;">  <div> <p>Sorry to be nosy, but it will also help me to know if you smoke?</p> <ul style="list-style-type: none"> <input type="radio"/> I don't smoke at all <input type="radio"/> I rarely smoke <input checked="" type="radio"/> I smoke often <input type="radio"/> I'd rather not say </div> </div> <div style="background-color: #f8d7da; padding: 10px; margin-top: 10px; border: 1px solid #f5c6cb;"> <p>I'm sorry to hear that. I can understand how difficult it must be to quit. This information helps me to decide whether I need to consider certain products that can counter the negative effects of smoking on your skin. Now that I know this, I'll look for ways to help your skin look fresh and healthy.</p> </div> <div style="text-align: center; margin-top: 10px;"> <input type="button" value="Next >>>"/> </div>

Table 5. Study 1 Screenshots of Treatment Virtual Advisors (continued)

<p>Advisor 11 ([<i>why</i> explanation] <i>Question</i> [<i>how</i> explanation] [commissive speech act] <i>Answer Options</i> [<i>expressive</i> speech act] [<i>how</i> explanation] [commissive speech act]): The advisor incorporated the characteristics of advisors 5 and 6. 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.</p>	<div style="text-align: center;"> <h2>Canadian Beauty Store</h2>  </div> <hr/> <div style="display: flex; align-items: flex-start;">  <div> <p>Aside from the many health issues associated with it, smoking may age one's skin faster than anything else, possibly apart from sun damage.</p> <p>Do you smoke?</p> <p>The response you provide may help the tool to determine if there is the need to recommend a product that will counter the negative effects of smoking. The response provided will be kept confidential.</p> <ul style="list-style-type: none"> <input type="radio"/> Never <input type="radio"/> Rarely <input checked="" type="radio"/> Often <input type="radio"/> Prefer not to disclose <div style="background-color: #fce4ec; padding: 5px; margin-top: 10px;"> <p>I am sorry to hear that. It is often difficult to quit. The information provided might help the tool decide if it needs to consider products that can counter the negative effects of smoking on one's skin. In light of your response, the tool may look for ways to help your skin look fresh and healthy.</p> </div> <div style="text-align: center; margin-top: 10px;"> Next >>> </div> </div> </div>
<p>Advisor 12 ([<i>why</i> explanation] <i>Question</i> [<i>how</i> explanation] [commissive speech act] <i>Answer Options</i> [<i>expressive</i> speech act] [<i>how</i> explanation] [commissive speech act] all using extravert phrasing): The advisor was similar to advisor 11. The only difference was that this advisor used extravert phrasing.</p>	<div style="text-align: center;"> <h2>Canadian Beauty Store</h2>  </div> <hr/> <div style="display: flex; align-items: flex-start;">  <div> <p>Aside from the many health issues associated with it, smoking ages our skin faster than anything else ... possibly with the exception of sun damage.</p> <p>Sorry to be nosey, but it will also help me to know if you smoke?</p> <p>The response you provide will help me to decide if I need to include products that will counter the negative effects of smoking on your skin. I will keep all responses you provide in the strictest confidentiality.</p> <ul style="list-style-type: none"> <input type="radio"/> I don't smoke at all <input type="radio"/> I rarely smoke <input checked="" type="radio"/> I smoke often <input type="radio"/> I'd rather not say <div style="background-color: #fce4ec; padding: 5px; margin-top: 10px;"> <p>I'm sorry to hear that. I can understand how difficult it must be to quit. This information helps me to decide whether I need to consider certain products that can counter the negative effects of smoking on your skin. Now that I know this, I'll look for ways to help your skin look fresh and healthy.</p> </div> <div style="text-align: center; margin-top: 10px;"> Next >>> </div> </div> </div>

2.4.5 Measures

All constructs used in this study were measured using multi-item scales (all items are listed in Table 6). New scales were developed to measure: 1) the three sub-dimensions of responsiveness and overall responsiveness; 2) the three sub-dimensions of rapport and overall rapport; 3) the two sub-dimensions of transparency and overall transparency; and 4) perceived expressiveness of the virtual advisor, consistent with their definitions. Perceived loss of privacy and perceived loss of face were measured using the scales developed by White (2004) after adapting them 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). The construct of perceived social adjustment benefits was measured using a scale adapted from that used in Hui et al. (2006). The three trusting beliefs were measured using the instrument developed by McKnight et al. (2002) and adapted to the context of virtual advisors by Wang and Benbasat (2005). Three new scales were developed to measure the three sub-dimensions of interdependence, consistent with their definitions in the literature.

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 (e.g., exercise, travel, face washing, make-up use), 3) Information about sensitive habits (e.g., sexual activity, smoking, use of birth control), 4) Information about skin care needs (e.g., skin type, areas to concentrate on), 5) Information about product preferences (e.g., favorite smells, skin goals), 6) Health information (e.g., changes you are going through, allergies, chronic conditions, prescription drugs), and 7) Opinions on various topics (e.g., concern for the environment, animal testing, preference for natural remedies).

Table 6. Study 1 Measurement Items

	S. Loading	Mean	S. Dev.
<i>Self-Disclosure Intentions: 7-point Likert Scale (Very unlikely - Very likely):</i>			
Intention to Self-disclose (Cronbach's Alpha = 0.92):			
1. Demographical information (e.g., gender, age, ethnicity)	0.82	6.35	0.97
2. Information about your general habits (e.g., exercise and travel habits)	0.81	6.14	1.22
3. Information about your sensitive habits (e.g., sexual activity, smoking)	0.65	5.08	1.94
4. Information about your skin care needs (e.g., skin type, areas to concentrate on)	0.85	6.52	0.85
5. Information about your product preferences (e.g., smells)	0.90	6.48	0.86
6. Information about your health (e.g., medical information, health conditions)	0.86	5.91	1.39
7. Your feelings, opinions and judgments about non-sensitive topics (e.g., concern for the environment, animal testing)	0.85	6.10	1.38
8. Your feelings, opinions and judgments about sensitive topics (e.g., preference for natural remedies)	0.89	6.10	1.32
<i>Benefits and Costs: 7-point Likert Scale (Strongly disagree - Strongly agree):</i>			
Loss of Privacy (Cronbach's Alpha = 0.87):			
1. Revealing this information to the Shopping Assistant could result in a loss of control over who knows what about me.	0.87	3.09	1.68
2. Revealing this information to the Shopping Assistant could result in an increase in solicitations from the online vendor.	0.86	4.10	1.60
3. Revealing this information to the Shopping Assistant could result in me losing my privacy.	0.93	3.62	1.75
Loss of Face (Cronbach's Alpha = 0.93):			
1. Revealing this information to the Shopping Assistant could be embarrassing.	0.92	3.37	1.66
2. Revealing this information to the Shopping Assistant could make others evaluate me negatively.	0.97	3.20	1.62
3. Revealing this information to the Shopping Assistant could result in me losing face.	0.93	2.82	1.50
Performance Expectancy (Cronbach's Alpha = 0.91):			
1. Revealing this information to the Shopping Assistant would help me get a better product(s).	0.88	5.65	1.19
2. Revealing this information to the Shopping Assistant would increase the likelihood that the recommended product(s) fits my individual needs.	0.94	5.87	1.08
3. Revealing this information to the Shopping Assistant could ensure that the recommended product(s) is personalized to my situation.	0.94	5.92	1.00

Table 6. Study 1 Measurement Items (continued)

	S. Loading	Mean	S. Dev.
Social Adjustment (Cronbach's Alpha = 0.92):			
1. Revealing this information to the Shopping Assistant allows me to gain social approval.	0.91	3.15	1.41
2. Revealing this information to the Shopping Assistant helps me adhere to social norms.	0.94	3.24	1.36
3. Revealing this information to the Shopping Assistant makes me feel like a member of the group.	0.93	3.32	1.45
<i>Relationship Beliefs: 7-point Likert Scale (Strongly disagree - Strongly agree):</i>			
Trust – Benevolence (Cronbach's Alpha = 0.89):			
1. The Shopping Assistant seemed to act in the best interest of the customer.	0.88	5.54	1.08
2. If help is required, the Shopping Assistant seemed willing to do its best to help the customer.	0.91	5.18	1.17
3. The Shopping Assistant seemed interested in the well-being of the customer.	0.93	5.18	1.30
Trust – Integrity (Cronbach's Alpha = 0.95):			
1. The Shopping Assistant seemed truthful in its dealings with the customer.	0.95	5.40	1.11
2. The Shopping Assistant seemed like it would keep its commitments.	0.94	5.29	1.15
3. The Shopping Assistant appeared to be honest.	0.96	5.38	1.12
4. The Shopping Assistant seemed sincere and genuine.	0.90	5.28	1.27
Trust – Competence (Cronbach's Alpha = 0.94):			
1. The Shopping Assistant was effective in its role.	0.95	5.50	1.11
2. The Shopping Assistant performed its role well.	0.95	5.60	1.09
3. The Shopping Assistant was proficient.	0.94	5.56	1.08
4. The Shopping Assistant was knowledgeable.	0.87	5.29	1.28
Interdependence – Level of Dependence (Cronbach's Alpha = 0.92):			
1. I felt dependent on the Shopping Assistant. [R]	0.91	3.15	1.53
2. I felt reliant on the Shopping Assistant. [R]	0.92	3.56	1.65
3. I felt contingent on the Shopping Assistant. [R]	0.89	3.38	1.41
4. I felt I needed the Shopping Assistant. [R]	0.88	3.58	1.71
Interdependence – Basis of Dependence (Cronbach's Alpha = 0.91):			
1. It seemed that the outcomes of the shopping task would be determined more by the Shopping Assistant's actions than my own actions. [R]	0.86	3.57	1.56
2. It seemed difficult to control which products would be recommended. [R]	0.91	3.67	1.60
3. It seemed unlikely that I could heavily influence the recommendations. [R]	0.87	3.41	1.47
4. The Shopping Assistant seemed to be more in control of the shopping task than I was. [R]	0.91	3.60	1.59

Table 6. Study 1 Measurement Items (continued)

	S. Loading	Mean	S. Dev.
Interdependence – Covariation of Interests (Cronbach’s Alpha = 0.94):			
1. The Shopping Assistant and I seemed to have common interests.	0.90	4.22	1.42
2. The Shopping Assistant and I seemed to share the same goals.	0.94	4.49	1.46
3. The Shopping Assistant and I seemed to have similar objectives.	0.96	4.67	1.40
4. The Shopping Assistant and I seemed to be trying to get the same end goal.	0.86	4.92	1.34
<i>Object-based Beliefs: 7-point Likert Scale (Strongly disagree - Strongly agree):</i>			
Responsiveness - Validating (Cronbach’s Alpha = 0.96):			
1. The Shopping Assistant makes the customer feel like an accepted individual after he/she answers a question.	0.96	5.28	1.42
2. The Shopping Assistant makes the customer feel like a valued individual after he/she answers a question.	0.96	5.15	1.46
3. The Shopping Assistant makes the customer feel at ease after he/she answers a question.	0.95	5.32	1.41
4. The Shopping Assistant makes the customer feel uncomfortable after he/she answers a question. [R]	dropped	5.54	1.46
Responsiveness - Caring (Cronbach’s Alpha = 0.97):			
1. The Shopping Assistant seems to care about the customer.	0.93	5.12	1.45
2. The Shopping Assistant shows concern for the customer.	0.97	4.97	1.52
3. The Shopping Assistant expresses empathy for the customer.	0.94	4.79	1.59
4. The Shopping Assistant is compassionate towards the customer.	0.96	4.83	1.52
5. The Shopping Assistant is considerate of the customer.	0.93	5.25	1.33
Responsiveness - Understanding (Cronbach’s Alpha = 0.93):			
1. The Shopping Assistant seems to understand the customer’s needs.	0.96	5.35	1.25
2. The Shopping Assistant seems to understand the customer’s feelings.	0.92	4.93	1.45
3. The Shopping Assistant seems to understand the customer’s specific situation.	0.94	5.26	1.34
Responsiveness - Overall (Cronbach’s Alpha = 0.94):			
1. Overall, the Shopping Assistant is responsive.	0.93	5.61	1.24
2. Overall, the Shopping Assistant is receptive.	0.93	5.37	1.29
3. Overall, the Shopping Assistant is empathetic.	0.89	5.02	1.49
4. Overall, the Shopping Assistant is acknowledging.	0.93	5.56	1.24
Rapport – Positivity (Cronbach’s Alpha = 0.92):			
1. The Shopping Assistant is friendly.	0.92	5.51	1.21
2. The Shopping Assistant is warm.	0.90	5.20	1.31
3. The Shopping Assistant is cordial.	0.92	5.58	1.12
4. The Shopping Assistant is genial.	0.86	5.28	1.22

Table 6. Study 1 Measurement Items (continued)

	S. Loading	Mean	S. Dev.
Rapport – Attentiveness (Cronbach’s Alpha = 0.93):			
1. The Shopping Assistant is focused on the customer.	0.86	5.90	1.00
2. The Shopping Assistant pays attention to the customer.	0.95	5.81	1.02
3. The Shopping Assistant is involved in its interaction with the customer.	0.89	5.75	1.07
4. The Shopping Assistant is attentive.	0.92	5.61	1.16
Rapport – Coordination (Cronbach’s Alpha = 0.94):			
1. The interaction with the Shopping Assistant is harmonious.	0.93	5.50	1.13
2. The interaction with the Shopping Assistant is balanced.	0.96	5.57	1.09
3. The interaction with the Shopping Assistant is well coordinated.	0.94	5.70	1.05
Rapport – Overall (Cronbach’s Alpha = 0.95):			
1. During the interaction with the Shopping Assistant, I felt a sense of rapport.	0.92	4.73	1.55
2. During the interaction with the Shopping Assistant, I felt we were in-sync.	0.97	4.88	1.38
3. During the interaction with the Shopping Assistant, I thought we clicked with each other.	0.95	4.75	1.45
Transparency – Purpose (Cronbach’s Alpha = 0.98):			
1. The Shopping Assistant explains why it asks each question.	0.98	4.58	2.01
2. The Shopping Assistant explains the relevance of each question.	0.98	4.42	2.03
3. The Shopping Assistant provides a justification for asking each question.	0.98	4.46	2.01
Transparency – Process (Cronbach’s Alpha = 0.98):			
1. The Shopping Assistant describes how the information solicited will be used.	0.97	4.52	1.97
2. The Shopping Assistant describes how the information solicited will affect its recommendations.	0.98	4.47	1.99
3. The Shopping Assistant describes how the information solicited will be incorporated into its decision-making.	0.97	4.54	1.94
Transparency – Overall (Cronbach’s Alpha = 0.96):			
1. The Shopping Assistant outlines how it will produce its product recommendations.	0.92	4.10	1.89
2. The Shopping Assistant clarifies what is being done at each stage.	0.94	4.37	1.89
3. The Shopping Assistant justifies its actions at each stage.	0.97	4.45	1.92
4. In general, the inner workings of the Shopping Assistant are made known to the customer.	0.93	4.43	1.91
Expressiveness (Cronbach’s Alpha = 0.94):			
1. The Shopping Assistant makes its feelings known to the customer.	0.90	4.04	1.87
2. The Shopping Assistant expresses emotions.	0.94	3.66	1.99
3. I felt a sense of openness on the part of the Shopping Assistant.	0.89	4.33	1.84
4. Overall, the Shopping Assistant is expressive.	0.96	4.19	1.93

[R] Indicates a reverse coded item.

2.5 Results

2.5.1 *Measurement Model and Manipulation Checks*

Factor and reliability analyses were conducted using the Statistical Package for the Social Sciences (SPSS). Construct reliability estimates (Cronbach's Alpha) and item standardized loadings are shown in Table 6. 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 125 subjects, the scores for all exogenous variables were examined to ensure that the treatments created adequate level of variance in each exogenous construct. Overall, the virtual advisors used were able to create an adequate amount of variation in the scores for overall and the sub-dimensions of responsiveness, rapport and transparency, as well as perceived expressiveness. The mean scores for the exogenous variables in each of the twelve treatment groups are shown in Table 7. A series of one-way ANOVAs were performed to examine whether, overall, the treatment groups differed in terms of the scores for each of the exogenous variables. In this analysis, the treatment group number was used as the sole fixed factor and the scores for each of the respective exogenous variable as the predicted variable. The f-values and significance values are shown in the first two columns of Table 7. Collectively, the treatments (using the treatment number as a fixed factor) were able to effect statistically significant differences in the scores for all exogenous variables with the exception of one sub-dimension of responsiveness, namely, understanding, as well as overall rapport.

To check whether there were any differences between subsets of the treatment conditions in terms of the scores of perceived understanding and overall rapport, we performed seven ANOVAs for each of these two variables. Each of these ANOVAs used one factor that symbolized whether each of the design elements was used or not (and hence the factor had two levels); one design element at a time. This analysis uncovered that the use of three of the design elements, namely, expressive speech acts, commissive speech acts to manifest the commitment to protect the disclosed information, and extravert phrasing can in fact result in

significant differences in perceived understanding scores ($F = 8.32, p < 0.05$; $F = 10.50, p < 0.01$; $F = 4.28, p < 0.05$ respectively). Similar analysis revealed that only the use of expressive speech acts resulted in statistically significant differences in the scores for overall rapport ($F = 4.48, p < 0.05$). Given the relatively high variance in the scores for these two variables (shown in the last column of Table 7), and the moderate sample size for some of the treatment groups, the lack of statistically significant differences between all the treatment groups should not be taken as an indication that the treatment did not affect perceptions on these two dimensions. The ANOVA results overviewed above indicate that such differences in fact exist, but mainly between subsets of the treatment groups.

Table 7. Study 1 Descriptive Statistics

			Treatment Group														
Construct	F-value	Sig.	1 N = 17	2 N = 9	3 N = 10	4 N = 9	5 N = 18	6 N = 8	7 N = 10	8 N = 8	9 N = 10	10 N = 9	11 N = 12	12 N = 12	Total Mean	Total ST.Dev	
Understanding	1.27	> 0.05	4.88	5.22	4.70	5.07	4.88	5.00	5.80	4.33	5.87	5.33	5.50	5.47	5.18	1.27	
Validating	1.94	0.05	4.75	5.28	4.63	5.44	5.07	5.66	5.73	4.47	6.03	5.89	5.73	5.48	5.32	1.23	
Caring	2.93	0.01	4.55	4.49	3.76	4.89	4.40	5.23	5.78	4.38	6.08	5.60	5.47	5.40	4.99	1.40	
Overall Responsiveness	3.67	0.01	4.76	5.17	4.38	5.47	4.66	5.50	6.18	4.94	6.25	6.00	6.06	5.60	5.39	1.21	
Positivity	2.53	0.01	4.84	5.42	4.68	5.44	5.30	5.53	6.13	4.53	6.10	5.69	5.69	5.58	5.39	1.09	
Attentiveness	1.86	0.05	5.43	5.58	5.23	5.64	5.75	6.16	6.15	5.06	6.33	6.19	6.04	5.79	5.77	0.96	
Coordination	2.64	0.01	4.96	5.56	5.37	5.48	5.36	5.83	6.30	4.71	6.13	6.11	5.97	5.56	5.59	1.03	
Overall Rapport	1.20	> 0.05	4.25	4.89	4.40	4.96	4.67	5.04	5.57	4.00	5.47	5.19	4.58	4.81	4.79	1.39	
Transparency - Purpose	5.07	0.01	2.57	4.26	4.43	2.48	5.24	5.04	4.60	3.83	5.27	5.85	5.67	5.33	4.49	1.97	
Transparency - Process	7.22	0.01	2.75	4.07	4.80	2.59	5.33	5.71	3.63	3.21	5.97	5.70	5.86	5.11	4.51	1.92	
Overall Transparency	5.25	0.01	2.87	4.00	4.08	2.67	4.73	5.23	4.14	3.60	5.18	5.27	5.48	5.12	4.32	1.65	
Expressiveness	4.72	0.01	3.07	3.33	2.70	3.31	3.75	3.25	5.28	3.31	5.38	5.14	5.04	5.06	4.05	1.77	

2.5.2 *Structural Model Results*

To test our hypotheses, we analyzed a structural model using Partial Least Squares (PLS) with SmartPLS 2.0 (Ringle, Wende, & Will, 2005). PLS was chosen instead of a covariance-based technique, because maximizing the variance explained in the endogenous variables, and specifically the intentions to self-disclose, was judged to be a more appropriate objective given the exploratory nature of some of the model's hypothesized relationships.

In the analyzed model, perceived benefits, perceived costs, trust, and interdependence were treated as second-order formative constructs, where the mean scores of their respective sub-dimensions were treated as formative indicators. The four items measuring the level of dependence and those measuring the basis of dependence were reverse coded since they indicated higher levels of dependence and unilateral basis of dependence respectively. Considering that the construct of interest is that of *interdependence*, the items were reverse coded to indicate lowered levels of the customer's dependence on the advisor, and perceptions of joint action. Also in the model, the overall scores of the multi-dimensional exogenous variables, namely responsiveness, rapport and transparency, were used. Finally, the intention to self-disclose was modeled as a second-order formative construct, formed by the mean scores of the intentions to self-disclose the seven different types of information described earlier.

The bivariate correlations between the model's constructs are shown in Table 8. The results of the structural model, including standardized path coefficients and the corresponding t-values are depicted in Figure 4. The weights of the formative indicators on the intentions to self-disclose construct, trust, interdependence, and the perceived benefits and costs are also shown. Standard errors were computed using a bootstrap procedure with 500 resamples. Table 9 summarizes the hypotheses and the level of support obtained for each.

To check whether the results obtained are an artifact of our modeling choice, two additional models were also analyzed. In the first additional model, the multi-dimensional exogenous variables, namely responsiveness, rapport and transparency, were treated as second-order formative constructs, with the mean scores for their sub-dimensions acting as the formative indicators. In the second additional model, these three multi-dimensional exogenous

variables were treated as second-order reflective constructs, and the mean scores for their sub-dimensions were treated as reflective indicators.

The results of these additional models are compared to the original one analyzed (and described in this section) in Appendix B. Specifically, Table 32 (Appendix B) shows the variance explained in all predicted constructs across the three models. Table 33 (Appendix B) summarizes the results of the two additional structural models, including standardized path coefficients and the corresponding t-values, and compares these to the original model. The weights of the formative indicators on the intentions to self-disclose construct, and the multi-dimensional formative second-order exogenous variables are shown in Table 34 (Appendix B), for all three models. The table also shows the loadings for each indicator when the exogenous variables are modeled as reflective second-order construct. Generally, the results from the two additional models were similar to the one described herein, indicating that the obtained results are not an artifact of our modeling choices.

Table 8. Study 1 Construct Correlations

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
1 POS	-																												
2 ATT	0.72**																												
3 COO	0.78**	0.77**																											
4 ORA	0.78**	0.72**	0.77**																										
5 UND	0.73**	0.78**	0.71**	0.79**																									
6 VAL	0.74**	0.78**	0.76**	0.81**	0.78**																								
7 CAR	0.76**	0.8**	0.73**	0.8**	0.83**	0.85**																							
8 ORE	0.74**	0.8**	0.77**	0.76**	0.83**	0.85**	0.89**																						
9 TPU	0.4**	0.36**	0.38**	0.39**	0.39**	0.41**	0.44**	0.42**																					
10 TPR	0.39**	0.43**	0.43**	0.36**	0.4**	0.43**	0.43**	0.42**	0.81**																				
11 OTR	0.44**	0.43**	0.46**	0.42**	0.47**	0.48**	0.51**	0.47**	0.83**	0.89**																			
12 EXP	0.67**	0.58**	0.55**	0.63**	0.71**	0.65**	0.79**	0.74**	0.58**	0.53**	0.65**																		
13 LPR	-0.18*	-0.21*	-0.24**	-0.27**	-0.27**	-0.27**	-0.31**	-0.32**	-0.26**	-0.12	-0.17	-0.26**																	
14 LFA	-0.13	-0.17	-0.15	-0.17	-0.21*	-0.2*	-0.2*	-0.24**	-0.18*	-0.03	-0.06	-0.14	0.78**																
15 PEX	0.29**	0.45**	0.44**	0.32**	0.4**	0.39**	0.33**	0.41**	0.17	0.25**	0.31**	0.20*	-0.35**	-0.32**															
16 SAD	0.23**	0.26**	0.25**	0.36**	0.36**	0.36**	0.32**	0.27**	0.18*	0.26**	0.3**	0.28**	0.02	0.15	0.12														
17 TBE	0.65**	0.75**	0.69**	0.71**	0.78**	0.71**	0.76**	0.7**	0.48**	0.49**	0.56**	0.67**	-0.34**	-0.26**	0.51**	0.31**													
18 TIN	0.65**	0.74**	0.73**	0.69**	0.71**	0.69**	0.77**	0.69**	0.52**	0.53**	0.57**	0.64**	-0.3**	-0.22*	0.42**	0.33**	0.9**												
19 TCO	0.63**	0.74**	0.72**	0.67**	0.71**	0.7**	0.72**	0.72**	0.55**	0.56**	0.6**	0.6**	-0.34**	-0.31**	0.48**	0.29**	0.83**	0.82**											
20 ILD	-0.32**	-0.25**	-0.25**	-0.41**	-0.4**	-0.40**	-0.37**	-0.32**	-0.16	-0.20*	-0.23**	-0.42**	0.10	0.06	-0.13	-0.35**	-0.34**	-0.34**	-0.3**										
21 IBD	0.21*	0.28**	0.25**	0.14	0.25**	0.13	0.26**	0.26**	0.19*	0.13	0.21*	0.28**	-0.35**	-0.27**	0.31**	-0.03	0.23**	0.21*	0.20*	0.21*									
22 ICI	0.5**	0.54**	0.49**	0.5**	0.61**	0.55**	0.57**	0.62**	0.39**	0.46**	0.46**	0.51**	-0.23*	-0.22*	0.51**	0.21*	0.62**	0.58**	0.62**	-0.33**	0.28**								
23 IDE	0.37**	0.46**	0.42**	0.29**	0.35**	0.35**	0.3**	0.37**	0.24**	0.28**	0.23**	0.21*	-0.35**	-0.22*	0.49**	0.04	0.38**	0.34**	0.41**	-0.02	0.24**	0.31**							
24 IGH	0.16	0.31**	0.27**	0.25**	0.27**	0.34**	0.26**	0.33**	0.22*	0.18*	0.23**	0.14	-0.44**	-0.33**	0.46**	0.07	0.32**	0.26**	0.3**	-0.07	0.29**	0.21*	0.56**						
25 ISH	0.13	0.23*	0.15	0.2*	0.24**	0.25**	0.25**	0.25**	0.17	0.15	0.17	0.12	-0.43**	-0.35**	0.43**	0.12	0.24**	0.16	0.22*	-0.10	0.18*	0.24**	0.44**	0.64**					
26 ISN	0.34**	0.49**	0.42**	0.3**	0.34**	0.38**	0.29**	0.37**	0.2*	0.23**	0.22*	0.18*	-0.32**	-0.19*	0.52**	0.03	0.42**	0.38**	0.45**	-0.07	0.17	0.30**	0.83**	0.56**	0.34**				
27 IPP	0.29**	0.46**	0.37**	0.27**	0.28**	0.37**	0.3**	0.38**	0.24**	0.25**	0.23**	0.17	-0.36**	-0.22*	0.47**	-0.01	0.39**	0.35**	0.42**	-0.02	0.21*	0.30**	0.77**	0.67**	0.4**	0.93**			
28 IHE	0.18*	0.37**	0.32**	0.29**	0.34**	0.38**	0.33**	0.37**	0.2*	0.15	0.19*	0.17	-0.51**	-0.37**	0.55**	0.12	0.43**	0.37**	0.41**	-0.07	0.16	0.29**	0.62**	0.73**	0.62**	0.65**	0.66**		
29 ION	0.24**	0.36**	0.3**	0.25**	0.27**	0.33**	0.29**	0.34**	0.14	0.15	0.13	0.17	-0.34**	-0.22*	0.48**	0.01	0.39**	0.32**	0.4**	-0.09	0.09	0.28**	0.6**	0.6**	0.52**	0.61**	0.68**	0.67**	
30 IOS	0.28**	0.41**	0.35**	0.28**	0.31**	0.35**	0.33**	0.39**	0.18*	0.19*	0.18*	0.21*	-0.38**	-0.26**	0.5**	0.02	0.42**	0.36**	0.43**	-0.08	0.16	0.34**	0.61**	0.65**	0.51**	0.67**	0.76**	0.74**	0.92**

POS: Positivity ATT: Attentiveness COO: Coordination ORA: Overall Rapport UND: Understanding VAL: Validating CAR: Caring ORE: Overall Responsiveness TPU: Transparency – Purpose TPR: Transparency – Process OTR: Overall Transparency EXP: Expressiveness LPR: Loss of Privacy LFA: Loss of Face PEX: Performance Expectancy SAD: Social Adjustment TBE: Trust – Benevolence TIN: Trust – Integrity TCO: Trust – Competence ILD: Interdependence – Level of Dependence IBD: Interdependence – Basis of Dependence ICI: Interdependence – Covariation of Interests IDE: Intentions - Demographical information IGH: Intentions - General habits ISH: Intentions – Sensitive habits ISN: Intentions - Skin care needs IPP: Intentions - Product preferences IHE: Intentions – Health ION: Intentions - Opinions on non-sensitive topics IOS: Intentions - Opinions on sensitive topics

** Correlation significant at p < 0.01

* Correlation significant at p < 0.05

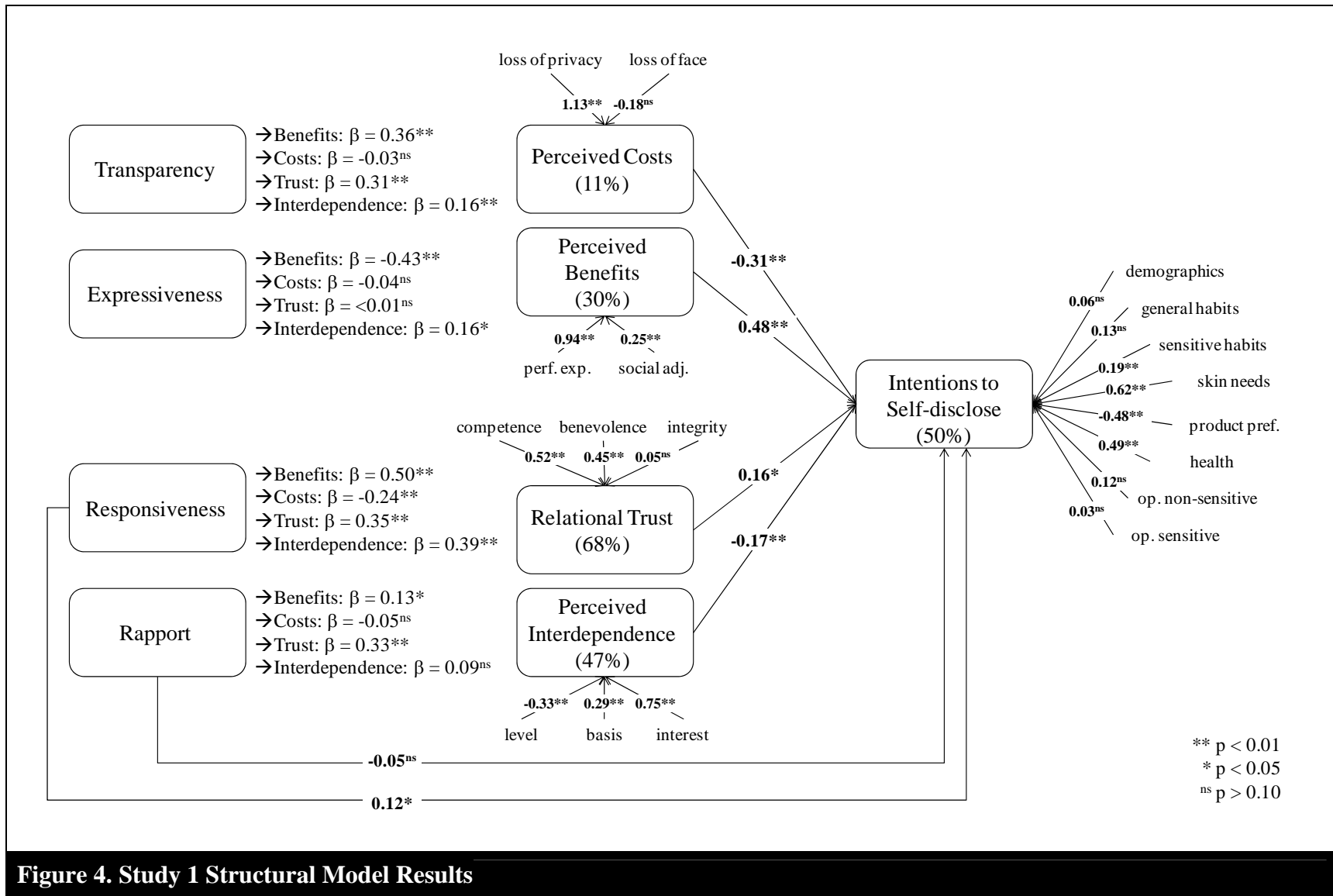


Table 9. Study 1 Summary of Hypotheses Support

Hypothesis	Effect	t-value	Supported?
H1 Perceived costs of disclosure negatively influence the intentions to self-disclose.	-0.31	7.85	Yes
H2 Perceived benefits of disclosure positively influence the intentions to self-disclose.	0.48	10.05	Yes
H3 Trust in the advisor positively influences the intentions to self-disclose.	0.16	2.48	Yes
H4 Interdependence positively influences the intentions to self-disclose.	-0.17	2.98	No (opposite direction)
H5 Responsiveness positively influences the intentions to self-disclose.	0.12	1.98	Yes
H6 Responsiveness positively influences perceived disclosure benefits.	0.50	7.41	Yes
H7 Responsiveness negatively influences perceived disclosure costs.	-0.24	2.72	Yes
H8 Responsiveness positively influences trust.	0.35	6.26	Yes
H9 Responsiveness positively influences perceived interdependence.	0.39	6.23	Yes
H10 Rapport positively influences the intentions to self-disclose.	-0.05	0.91	No
H11 Rapport positively influences perceived benefits of disclosure.	0.13	2.07	Yes
H12 Rapport negatively influences perceived costs of disclosure.	-0.05	0.66	No
H13 Rapport positively influences trust in the virtual advisor.	0.33	6.63	Yes
H14 Rapport positively influences perceived interdependence.	0.09	1.41	No
H15 Transparency positively influences perceived disclosure benefits.	0.36	8.47	Yes
H16 Transparency negatively influences perceived disclosure costs.	-0.03	0.45	No
H17 Transparency positively influences trust.	0.31	7.87	Yes
H18 Transparency positively influences perceived interdependence.	0.16	3.23	Yes
H19 Expressiveness positively influences perceived disclosure benefits.	-0.43	7.33	No (opposite direction)
H20 Expressiveness negatively influences perceived disclosure costs.	-0.04	0.51	No
H21 Expressiveness positively influences trust.	0.00	0.03	No
H22 Expressiveness positively influences perceived interdependence.	0.16	2.01	Yes

2.5.2.1 The effects of Benefits and Costs on Self-disclosure Intentions

As predicted in hypothesis 1, the perceived costs of self-disclosure had a statistically negative effect on the intentions to self-disclose ($\beta = -0.31$, $p < 0.01$). Hence, hypothesis 1 is supported. The results regarding the weights of the two formative indicators of perceived

costs confirmed that while perceived loss of privacy risk had a statistically significant weight on the second-order construct, the weight of perceived loss of face risk was insignificant.

The results further confirmed that the perceived benefits of self-disclosure exert a statistically significant positive effect on the intentions to self-disclose ($\beta = 0.48$, $p < 0.01$). Therefore, hypothesis 2 is supported. The weights of the two formative indicators representing the mean scores for each of the two perceived benefits (performance expectancy and social adjustment) were both positive and statistically significant, indicating that both types of perceived benefits contributed to the overall positive effect of perceived benefits on self-disclosure intentions.

2.5.2.2 The effects of Relationship Beliefs on Self-disclosure Intentions

The results regarding the effects of trust on self-disclosure intentions were relatively weaker than other determinants, yet positive and statistically significant ($\beta = 0.16$, $p < 0.05$). Hence, hypothesis 3 is supported. Examining the weights of the three trust sub-dimensions in the model reveals that this effect is mainly driven by perceptions of the advisor's competence and benevolence. The weight of perceived integrity was statistically insignificant.

The observed effect of perceived interdependence on self-disclosure intentions runs counter to that predicted in hypothesis 4. The results from the model confirmed that perceived interdependence exerts a negative effect on the intentions to self-disclose ($\beta = -0.17$, $p < 0.01$). Furthermore, while the three sub-dimensions of interdependence had statistically significant weights, indicating a significant effect of each on self-disclosure intentions, the directions of these effects varied. Specifically, while the perceived level of dependence (items were reverse coded to indicated reduced levels of dependence) had a statistically significant negative weight on the second-order formative construct (thus, indicating a positive effect on self-disclosure intentions given that the overall effect of the second-order construct was also negative), the two other sub-dimensions had positive weights (indicating a negative effect on self-disclosure intentions). An examination of the bivariate correlations in Table 8 reveals more mixed results. While the perceptions of lower dependence (level of dependence) had a positive correlation with the perceived basis of dependence (items were reverse coded to indicated joint basis of dependence), it has a negative correlation with

perceptions of covaried interests ($r = 0.21, p < 0.05$ and $r = -0.33, p < 0.01$, respectively). The latter has a positive correlation with perceptions of joint actions basis of dependence ($r = 0.28, p < 0.01$).

2.5.2.3 The effects of Object-based Beliefs on the Endogenous Variables

Consistent with hypothesis 5, perceived responsiveness exerted a positive and statistically significant effect on self-disclosure intentions ($\beta = 0.12, p < 0.05$)⁴. The effects of responsiveness on the other endogenous variables were also statistically significant. Specifically, responsiveness exerted statistically significant positive effects on the perceived benefits of self-disclosure ($\beta = 0.50, p < 0.01$), trust ($\beta = 0.35, p < 0.01$), and perceived interdependence ($\beta = 0.39, p < 0.01$), and a negative effect on the perceived costs of self-disclosure ($\beta = -0.24, p < 0.01$)⁵. Therefore, hypotheses 6, 7, 8, and 9 are all supported.

The effect of rapport on self-disclosure intentions were not statistically significant ($\beta = -0.05, p > 0.10$). Therefore, no support was obtained for hypothesis 10. On the other hand, perceived rapport had statistically significant and positive effects on the perceived benefits of self-disclosure ($\beta = 0.13, p < 0.05$) and trust ($\beta = 0.33, p < 0.01$). As a result, hypotheses 11 and 13 are both supported. Alternatively, rapport did not have significant effects on the perceived costs of self-disclosure ($\beta = -0.05, p > 0.10$) or perceived interdependence ($\beta = 0.09, p > 0.10$); failing to lend support to hypotheses 12 and 14⁶.

⁴ These results of the additional models in Appendix B indicate that the manner in which responsiveness is measured and modeled does in fact impact the effects of that construct.

⁵ It is worth noting that the effects of responsiveness on these four endogenous variables varied significantly between the three models. Generally, the largest path coefficients were observed when responsiveness was modeled as a second-order reflective construct. Table 34 (Appendix B) lists the standardized weights for the sub-dimensions of responsiveness when it was modeled as a second-order formative construct, and the standardized loadings for the sub-dimensions when it was modeled as a second-order reflective construct. The standardized weights from the second model indicate that the three sub-dimensions contribute to perceived responsiveness' overall effects, with perceived understanding being the most influential sub-dimension. The results from the third model reveal that the standardized loadings of the three sub-dimensions are large in magnitude and statistically significant (all exceeding the cutoff value of 0.7), lending support to the appropriateness of modeling perceived responsiveness as a reflective construct.

⁶ Examining the standardized weights depicted in Table 34 (Appendix B) reveals that the effects of rapport in model 2 are driven by perceived attentiveness and coordination. In model 3, all three sub-dimensions had large and statistically significant loadings on the reflective second-order construct, highlighting the significant covariation amongst them.

Perceived transparency had positive and significant effects on the perceived benefits ($\beta = 0.36, p < 0.01$), trust ($\beta = 0.31, p < 0.01$), and perceived interdependence ($\beta = 0.16, p < 0.01$). The effects of transparency on the perceived costs of self-disclosure failed to reach statistical significance ($\beta = -0.0, p > 0.10$). Thus, while hypotheses 15, 17, and 18 are supported, no support was obtained for hypothesis 16⁷.

The effects of perceived expressiveness on the perceived benefits were inconsistent with our prediction in hypothesis 19, where perceived expressiveness exerted a statistically significant *negative* effect on the perceived benefits ($\beta = -0.43, p < 0.01$). This effect contradicts the positive bivariate correlations that perceived expressiveness has with the two perceived benefits, namely performance expectancy ($r = 0.20, p < 0.05$) and social adjustment ($r = 0.28, p < 0.01$). This contradiction points to the potential of suppression effects by other constructs in the model.

Perceived expressiveness had no effects on the perceived costs of self-disclosure ($\beta = -0.04, p > 0.10$). Hence, no support was obtained for hypothesis 20. The effect of expressiveness on trust was also not statistically significant ($\beta = 0.01, p > 0.10$); failing to support hypothesis 21. Alternatively, the effect of expressiveness on perceived interdependence was positive and significant ($\beta = 0.16, p < 0.05$). Hence, hypothesis 22 is fully supported.

Figure 4 also depicts the variance explained in each of the endogenous variables. The variances explained in the two relationship beliefs, namely trust (68%) and interdependence (47%), were significantly higher than those explained in the benefits (30%) and costs (11%). The proportion of variance explained in the intentions to self-disclose construct was relatively large. Approximately half of the variance in those scores is explained by the proposed determinants of self-disclosure intentions.

The weights of the eight self-disclosure intention items are shown in Table 34 and Figure 4. The results indicated that the intentions to disclose four of the eight types of information were more influential than the four others. The results further revealed that the intentions to disclose product information had a negative weight. Yet, the bivariate correlations between

⁷ The standardized weights and loadings in Table 34 (Appendix B) reveal that both types of transparency, namely purpose and process, do in fact contribute to perceived transparency's overall effects.

this item and other self-disclosure intentions items were all positive and statistically significant.

2.6 Discussion of the Results, Limitations, Contributions and Concluding Remarks

2.6.1 Discussion of the Findings

This experimental study provides general support for the proposed model of the determinants of customers' intentions to self-disclose to online virtual advisors. The results lend support to the view of self-disclosure as a form of social exchange determined by the perceived benefits and costs of disclosure. Specifically, the perceived benefits and costs of disclosing the solicited information to the virtual advisor had the largest effects on the intentions to self-disclose. This is not surprising considering that the rewards and costs view of self-disclosure has garnered consistent support in social psychology as well as consumer contexts. In the context of this study, these effects may have been strengthened by the utilitarian nature of the task, as well as the chosen design elements which increased the saliency of these costs and benefits.

The results further revealed that perceived loss of privacy is an influential predictor of the intentions to self-disclose. Perceived loss of face, in contrast, had an insignificant contribution to the overall effect of the perceived costs of self-disclosure. A number of issues could have contributed to this. First, the two types of costs are highly correlated ($r = 0.78$, $p < 0.01$) and potentially causally related. It is reasonable to expect that a customer who is worried about loss of face as a result of disclosing the solicited information, will also be concerned about how that mishandling that information. In essence, heightened loss of face perceptions should be expected to increase perceptions of loss of privacy risks. Alternatively, a customer with heightened loss of privacy perceptions (e.g., worried about disclosing information vis-à-vis his/her sexual activity), is more likely to be embarrassed when revealing sensitive information or when this information is shared with others. Second, loss of face is expected to be a likely outcome only when the information is socially sensitive in nature, and specifically, when the discloser provides a socially undesirable response. The bivariate correlations between perceived loss of face and the different intentions to disclose items shown in Table 8 seem to support this proposition. Perceived loss of face had the

highest correlations with the intentions to disclose information regarding sensitive habit and health issue ($r = -0.35, p < 0.01$; $r = -0.37, p < 0.01$, respectively).

Similar to the case of perceived costs, the results also revealed that the contributions of the two individual perceived benefits to the overall effects on the intentions to self-disclose differ significantly. Specifically, the influence of perceived performance expectancy is significantly larger than that of perceived social adjustment benefits. By focusing on how disclosing to the advisor can help improve its recommendation more than achieve social adjustment, subjects viewed the virtual advisor more as a recommender system than an interaction partner. Nonetheless, the significance of the weight of social adjustment on the second-order perceived benefits construct indicates that affiliation is also a motivator to self-disclose.

The effects of the relationship beliefs were more modest compared to those of the benefits and costs. In general, this might be explained by the fact that the strength with which these relationship beliefs are held is positively correlated to the length and depth of the relationship. As proposed by Al-Natour and Benbasat (2009), the saliency and effects of these beliefs increase as the relationship progresses and those involved have the knowledge-base from within the relationship to hold these beliefs with maximum confidence. In other words, with more interactions, subjects will have the basis to evaluate their relationship with the advisor more accurately, and as a result, will likely move away from focusing on the outcomes from a single interaction.

The individual effects of trust and perceived interdependence warrant further examination. While the effects of trust on self-disclosure intentions have received consistent support in social psychology and consumer literature (e.g., Wheelless and Grotz, 1977; Wheelless, 1978), the results of the results from this study were less consistent. Trust's overall modest effects in the structural models stand in clear contrast to the relatively large bivariate correlations between the dimensions of trust and the different items of self-disclosure intentions shown in Table 8. This indicates that while trust is an important determinant of the intentions to self-disclose in general, its effects are reduced when other determinants are included. This is not surprising considering that the dimensions of trust examined conceptually overlap with some of the responsiveness and rapport sub-dimensions examined in this study. An example is the

overlap between benevolence on one hand, and attentiveness, understanding and care on the other. These object-based beliefs share bivariate correlations with benevolence that exceed 0.70.

As highlighted earlier, the effects of perceived interdependence are surprising. Despite their positive bivariate correlations with the intentions to self-disclose items, the basis of dependence and covariation of interests sub-dimensions exerted negative effects in the structural models. This can be attributed to their generally high correlations with other constructs in the model. In fact, when the perceived benefits and trust constructs are removed from the model, the effects of perceived independence become positive. This indicates that at a given level of trust and perceived benefits (controlling for the effects of these two), the differential power explanations for the effects of interdependence on self-disclosure fails. On the contrary, when controlling for the effects of these two variables, increased interdependence (and hence reduced dependence) via joint control of outcomes and higher covariation of interests tend to reduce the intentions to self-disclose, maybe because the customer feels more powerful and thus elects not to reduce their power through increasing their vulnerability through self-disclosure. In conclusion, these interrelationships between interdependence and other self-disclosure determinants warrants further investigation in future research. Potentially, perceived benefits and trust could serve as moderators of the effects of interdependence on self-disclosure intentions. Alternatively, as shown in some past research, under some circumstances disclosure can be used as an integration technique with others who are more powerful. As found by Slobin et al. (1968), while it is true that most disclosures are made to others with the same level of power (fellow workers in a business organization), there is a tendency to disclose more to others with more formal power (immediate superiors) than those with less formal power (immediate subordinates).

The effects of the object-based beliefs on the behavioral and relationship beliefs lend support to Al-Natour and Benbasat's (2009) belief hierarchy of effects. In general, perceived responsiveness acted as a better predictor of the subsequent beliefs than perceived rapport. This highlights the importance of responding appropriately to customers' self-disclosures as means for enhancing perceptions of the benefits of these disclosures, the trustworthiness of the advisor, and the interdependency of the relationship with it, while also reducing

perceptions of the costs of self-disclosure. In contrast, the effects of perceived rapport (driven mainly by attentiveness and coordination) were generally weaker, albeit it had a moderate effect on trust.

In general, the two interaction-level object-based beliefs had small or insignificant direct effects on the intentions to self-disclose. When this is contrasted with their significant bivariate correlations with the different intention items, it becomes clear that their overall effects are being mediated by the other endogenous variables. This lends further support to Al-Natour and Benbasat's (2009) model, in which the effects of object-based beliefs on behavioral intentions were assumed to be fully mediated by behavioral and relationship beliefs.

The bivariate correlations between the overall constructs and sub-dimensions of responsiveness and rapport (shown in Table 8) indicate that these constructs covary significantly. This is not surprising given the conceptual closeness between certain sub-dimensions such as attentiveness, care and validation. Another contributing factor is the type of manipulations used. As highlighted in the earlier discussion of the role of design characteristics, many of the chosen design manipulations were expected to affect perceptions on multiple of these sub-dimensions. As discussed earlier, the focus of this study was on creating variances in their scores that enable an examination of their effects on subsequent beliefs and intentions. Hence, there was no need to isolate the individual effects of the sub-dimensions of responsiveness and rapport or their design antecedents.

The relatively large effects that perceived transparency had on the perceived benefits and trust are not surprising. They indicate that increased knowledge of the inner workings of the advisor enhance expectations that the self-disclosures will help in attaining a better outcome, likely because this increased knowledge helps the customers to better understand the connection between the solicited information and the quality of the recommendation. Perceived transparency's effect on trust indicate that knowledge of the advisor's inner

workings is sufficient to enhance perceptions of its trustworthiness, regardless of whether the advisor's behaviors are understood or thought to be justified⁸.

As highlighted earlier, perceived expressiveness negative effect on the perceived benefits is surprising, especially given its positive bivariate correlation with the two individual benefits. The high correlation expressiveness has with the sub-dimensions and overall rapport and responsiveness, whether caused by their conceptual overlap or the chosen manipulations, could help explain this inconsistency, since these compete as predictors of the perceived benefits. The lack of effect on trust could also be attributed to this competition, especially that although significant in magnitude, the bivariate correlations between perceived expressiveness and the sub-dimensions of trust are lower than those between the latter and other object-based beliefs. Perceived expressiveness effects on interdependence highlight that more openness and increased emotional expressiveness on the part of the advisor can enhance perceptions of cooperation and mutuality.

The results in regards to the percentages of variance explained in each of the endogenous constructs highlight the need to identify more determinants of self-disclosure costs, and to a lesser degree the benefits. Some of these determinants could be the relationship beliefs examined in the proposed model. For instance, it is easy to imagine why trust might help reduce perceptions of loss of privacy costs, or increase perceptions of performance expectancy. Similarly, perceptions of covaried interest, a sub-dimension of interdependence, substantiate a sense of cooperation and mutuality, and can subsequently enhance perceptions of the benefits and reduce those of the costs. Given that the objective of this study was to investigate the determinants of self-disclosure intentions rather than the interrelationships between these determinants, these potential causal relationships were not specified or examined.

⁸ The results from the three different structural models (described in Appendix B) show that the effects of transparency are largest when it is modeled as an overall construct rather than a second-order construct reflected or formed by its sub-dimensions of purpose and process. This could be caused by the increased generality of the overall construct, since in addition to asking about knowledge of the process and the purpose, it asks about knowledge of how recommendation will be produced. Another possibility is that the observed larger effects of overall transparency in the first model are the result of changes in the magnitude of the effects of its co-predictors responsiveness and rapport when modeled as overall constructs in that same model.

The relatively large proportions of variances explained in the relationship beliefs and the intentions to self-disclose reaffirm the sufficiency of the identified determinants, and the appropriateness of the model's theoretical basis. Overall, the results of this study support the proposition that self-disclosure is a form of social exchange as well as a relational and interpersonal situated practice.

2.6.2 Limitations and Future Research

Before discussing the contributions of this study, we first consider its limitations. First, the study examines only a subset of potentially salient perceived benefits and costs. This is justified by the fact that the current study focused on examining the overall sufficiency of the rewards and costs explanation to self-disclosure. Our choice of the examined benefits and costs was motivated by past research in similar contexts, and our judgment as to the more influential and salient benefits and costs given the context of this study. Future research should attempt to identify and examine the effects of additional benefits and costs. Similarly, future research should attempt to identify and examine additional potentially salient relationship beliefs and characteristics of the virtual advisor. These efforts should lead to the identification of more antecedents to perceptions of benefits and costs, which will help increase the percentage of variance explained in these constructs.

The study was cross-sectional in nature. A longitudinal study might be necessary to fully understand how the progression of the relationship between the virtual advisor and the customer will affect the latter's willingness to disclose personal information, especially when it is socially sensitive in nature. The study conducted by White (2004) can provide a preview of what may be expected. In that study it was shown that while relationship depth encourages disclosures due to its role in reducing the perceived risks of loss of privacy, it also works to hinder disclosures when the elicited information could result in embarrassment.

Given the large number of constructs in the examined model, and the study's focus on understanding the overall effects of the different categories of beliefs, it is hard to fully understand the effects of the individual benefits and costs or the first-order dimensions of other examined constructs. Future research should focus on isolating the effects of the sub-

dimensions of multidimensional constructs and the individual benefits and costs, as well as examining their interrelationships.

While this study is one of few that attempted to understand how the design of a virtual advisor can affect customers' willingness to provide it with the information it solicits, the study's design makes it difficult to isolate the effects of individual design elements. Future research should focus on identifying other design elements that can cue perceptions that encourage self-disclosures. Subsequently future work should examine their effects via factorial designs in order to understand their main effects as well as indirect ones. This task is not trivial considering that similar to the design elements examined in this study, we expect that some of these other design elements will have similar effects, and each of these design elements will impact a number of perceptions.

Finally, the study mainly examined the breadth dimension of self-disclosure. While self-disclosure intentions were measured separately for different types of information, the study does not investigate whether information sensitivity has a role in moderating the effects of the examined determinants. Furthermore, the study only focused on the intentions to self-disclose. Examining the relationship between the intentions and other facets of self-disclosure, such as the accuracy of self-disclosures and actual disclosure behavior, is another promising avenue for future research.

2.6.3 Contribution to Research and Practice

Notwithstanding these limitations, this study makes a number of contributions to research and practice. Its main contribution to IS research is an understanding of the factors that influence a user's intentions to provide personal information to an IT artifact, and specifically, a customer's intentions to self-disclose to a virtual advisor. In contrast to past research that has looked at some of the factors that can induce customers to provide information needed for ordering a product or building a customer profile, this study identified and examined a number of task-relevant determinants to disclosing personal information needed for establishing the requirements for a product. In so doing, this study offers an insight into the factors that influence the decision to disclose information of varying types and levels of sensitivity.

To the best of our knowledge, the current study is the first in IS research, and likely one of only few in social psychology and consumer research, that examines a comprehensive model of the determinants of self-disclosure that goes beyond the rewards and costs explanation. Viewing self-disclosure not only as a social exchange, but also as a relational and an interpersonal situated practice, allows for the identification of other salient beliefs that are not utilitarian in nature and which can affect the decision to self-disclose.

The results of this study provide support for the appropriateness of the structure of the proposed model, and can be considered to be the first empirical study that tests and corroborates Al-Natour and Benbasat's (2009) proposed framework for the study of user-IT artifact interactions. The observed effects of the social characteristics of the advisor and the relationship with it, provides further support to the view of IT artifacts as social actors advocated in recent IS research.

One of the study's contributions to IS research and practice is that of examining how the design of the virtual advisor, in general, can affect customers' self-disclosure intentions. From a research perspective, the study identifies a number of theoretical bases, namely speech acts, explanation facilities and verbal cues, which can be used to alter perceptions of the virtual advisor. From a practical perspective, the study highlights how the use of different types of speech acts and explanations can help induce customers to self-disclose through cueing certain characteristics of the advisor. Having said that, it is important to note that given the study did not employ a full-factorial design (given its focus on attempting to create variance in the different antecedent variables rather than specifically examine the effects of the different design elements), the effects of the specific design elements cannot be isolated; an objective that is met in Study 2.

The study also lends further support to significant role rewards and costs play in consumer exchanges. The significant effect of perceived performance expectancy indicates that customers are willing to provide the solicited information if they believe that this will enhance the quality of the advice they will receive. Thus, e-vendors should ensure that the advisor highlights these expected benefits, and that it fulfills its part of this exchange by offering good personalized advice. The large effect exerted by loss of privacy concerns,

reaffirms the importance of formulating, communicating, and implementing sound privacy policies and practices.

The generally large effects of the object-based beliefs on the endogenous variables signify that customers' perceptions of the expected outcomes (benefits and costs) and the relational aspects of the exchange (trust and interdependence) can be enhanced via controlling the characteristics the advisor manifests. This is a significant implication, as it underscores the importance of ensuring the deployed virtual advisors are well and carefully designed so they manifest the desired characteristics.

3 THE ROLE OF EMOTIONS IN CUSTOMER SELF-DISCLOSURES TO ONLINE VIRTUAL ADVISORS

3.1 Overview

Study 1 has confirmed that a host of factors are influential predictors of customers' intentions to self-disclose personal information to online virtual advisors. Yet, the striking statistics described in the Pew Internet & American Life Project report (Horrigan, 2008) overviewed earlier, also highlights the importance of mitigating customers' concerns about their disclosures, and making them feel more comfortable about disclosing the solicited information. Anchored in this, Study 2 builds on Study 1 and examines the effects of emotions on customers' willingness to self-disclose to online virtual advisors. Specifically, the study examines the effects of two perceived benefits and two perceived costs on evoking both positive and negative emotions, and the effects of the latter on self-disclosure intentions and the accuracy of the intended self-disclosures. The choice of the specific antecedent beliefs to be investigated in this study was based on the results obtained in Study 1, where those that were found to be the most influential determinants of self-disclosure intentions were chosen.

Study 2 also deals with some of the issues that were not dealt with in Study 1. Specifically, Study 2 examines the individual benefits and costs separately in order to get a more accurate view of their effects. Second, the study examines the effects of self-disclosure determinants separately for the sensitive and non-sensitive information solicited. In so doing, Study 2 examines the moderating role of self-disclosure depth (intimacy). Finally, Study 2 examines the relationship between the different facets and dimensions of the self-disclosure construct. Specifically, it investigates the relationship between customers' intentions to self-disclose and their intentions to provide accurate self-disclosures. As highlighted in past research on customer self-disclosure, falsification or misrepresentation is an equally common response to self-disclosure requests as is refusal (Son and Kim, 2008).

An online experiment was conducted to investigate these aspects. Similar to Study 1, this study used a skin care context, where customers were asked to interact with an online virtual advisor tasked with assisting them find suitable products. To our knowledge, this is the first

empirical study that examines and explicitly compares the effects of different benefits and costs on the emotions customers experience during self-disclosure episodes, and the consequential effects of these emotions on self-disclosure accuracy, intimacy and intentions. It thus fills a void in the literature and contributes not only to a better understanding of the phenomenon of customer self-disclosure, but also to the concerted effort by online vendors, privacy advocates, and government associations to enhance customers' confidence in online shopping.

The remainder of this chapter is organized as follows. Section 3.2 presents the research model and develops the hypotheses. The research method and results of hypothesis testing are reported in sections 3.3 and 3.4. The chapter concludes with a discussion of the results, limitations, and contributions of the study in section 3.5.

3.2 Research Model and Hypotheses

The research model is shown in Figure 5. The model highlights the proposed relationships examined in Study 2. In contrast to our treatment of the perceived benefits and costs of self-disclosure as second-order constructs in Study 1, Study 2 examines the effects of individual benefits and costs. Specifically, two perceived benefits, namely performance expectancy and novelty, are proposed to exert direct effects on the positive emotions customers experience during their interaction with the virtual advisor, as well as their self-disclosure and accuracy intentions. Similarly, two perceived costs, namely loss of privacy and loss of face, are proposed to exert positive effects on the experienced negative emotions and the two intention variables. The model further proposes that both the negative and positive emotions will exert further effects on the two intention variables. Finally, we propose that the effects of the determinants of the two types of self-disclosure intentions will be moderated by the type of information solicited.

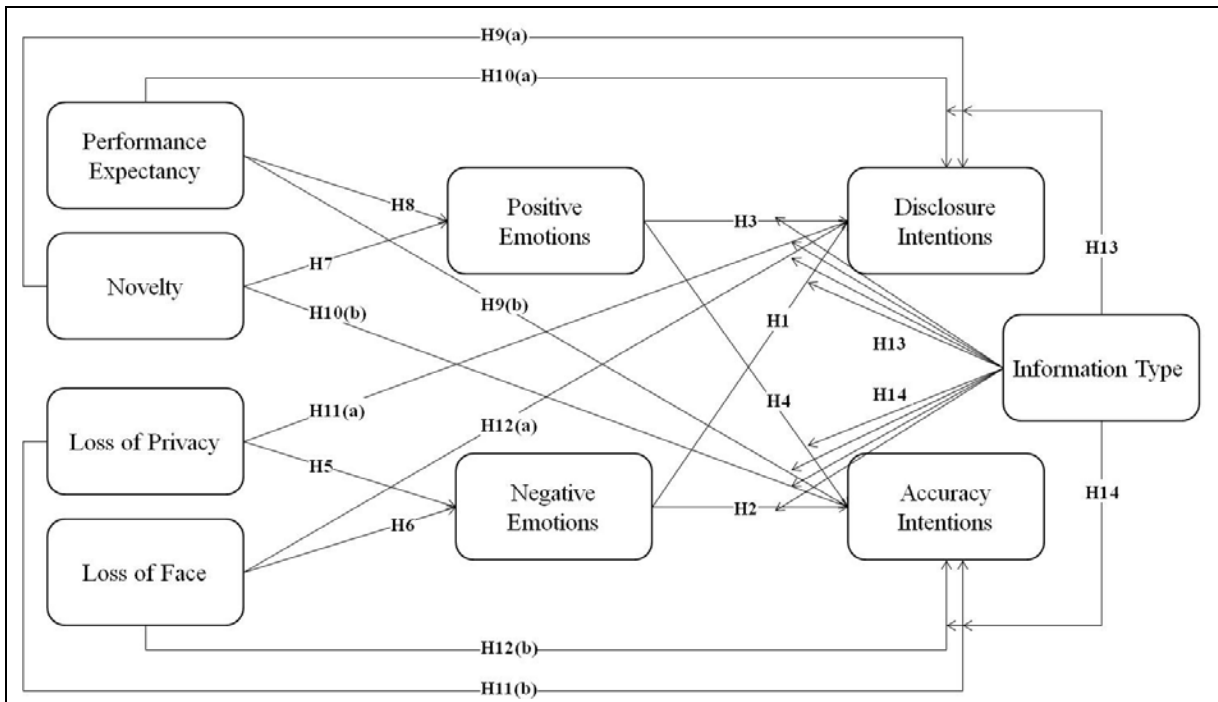


Figure 5. Study 2 Research Model

3.2.1 The Different Self-Disclosure Responses

As was discussed in Section 1 of this dissertation, past research has identified a number of distinct dimensions making up the construct of self-disclosure (e.g., Wheelless and Grotz, 1977). Figure 1 (Section 1) distinguishes between the different facets of the self-disclosure constructs and its dimensions. In terms of dimensions, self-disclosures can differ in terms of their breadth (amount), depth (intimacy), or duration (typically combined with the breadth dimensions). These three dimensions characterize one’s self-disclosure based on the type and amount of information disclosed. The different facets of self-disclosure, namely intention, behavior, accuracy, and valence, concern the specific aspects of self-disclosure that are captured in the measured construct.

Clearly, the dimensions and facets of self-disclosure are invariably related (Omarzu, 2000). When measuring the depth of someone’s self-disclosures for instance, one could focus on the intentions to self-disclose, the actual behavior of disclosing intimate information, and the accuracy or valence of these disclosures. In Study 1, the focus has been on measuring self-

disclosure intentions, both in terms of breadth and depth. The former was accomplished by asking customers about the likelihood of disclosing certain information, and the latter via capturing disclosure intentions separately for information that differs in its intimacy level. Study 2 adopts this view and complements it by further capturing the intended accuracy of self-disclosures, both in terms of depth and breadth. In other words, in addition to asking subjects about the extent to which they intend to disclose information of varying levels of intimacy, this study also captures their intentions to provide accurate information when asked about each of these different disclosure areas.

In consumer contexts, the accuracy of self-disclosures is of no less importance than the willingness to disclose. Self-disclosure falsification has been a problem that plagued online-based information collection for many years (Son and Kim, 2008), and potentially has more serious consequences than disclosure refusal. Past surveys within the context of information privacy reported that up to 50% of online users had falsified the personal information provided to online companies (Cavoukian and Hamilton 2002). This is problematic to online vendors because it can jeopardize their efforts to build accurate customer profiles, or even their efforts to assist the customer, as when interacting with online virtual advisors. In such a context, falsification can reduce the quality of the advice provided since it would be based on inaccurate information.

While the intended accuracy of self-disclosure is independently captured in this study for each type of information solicited, the relationship that *may* exist between the intentions to self-disclose and the intended accuracy is not examined. This is mainly due to the fact that such a relationship is likely non-deterministic. Specifically, the intentions to provide accurate information need only be considered when the intentions to self-disclose are high. Alternatively, the lack of desire to provide accurate information may or may not reduce one's intentions to self-disclose, especially if falsification behavior is possible and inconsequential.

3.2.2 The Role of Emotions in Customer Self-Disclosures

Emotion has been defined as a mental state of readiness that arises in response to cognitive appraisals of something of relevance to one's well-being (Bagozzi, Gopinath, and Nyer, 1999). Appraisal theories of emotions have differentiated between negative and positive

emotions, and linked each to goal fulfillment and past or anticipated outcomes. For instance, negative emotions emerge as a result of failure to achieve a desired goal or experiencing an unpleasant event (outcome-desire conflict), or alternatively, reactions that transpire in anticipation of unpleasant outcomes or goals (outcome-desire avoidance). Similarly, positive emotions can be the result of achieving a desired outcome or experiencing a pleasant event (outcome-desire fulfillment), or conversely, the result of anticipating desired goals or outcomes (outcome-desire pursuit) (Bagozzi et al., 1999).

Within the context of customers' interactions with virtual advisors, these different appraisal processes are likely to be in effect. First, during their interaction with the virtual advisor, customers can experience a number of emotions that are evoked as a result of the nature of the questions being asked or the responses received. Second, the anticipation of desired or undesired outcomes can also evoke emotions that are consistent with outcome-desire avoidance and pursuit. The promise of a personalized skin care solution, for instance, can evoke positive anticipatory emotions. Consequently, this will energize volitions in the service of goal striving and influence goal-directed behaviors, such as deciding to, and disclosing information that will enable the attainment of healthier skin via the personalized skin care product (Bagozzi, Baumgartner, and Pieters, 1998).

Consistent with the typology described earlier, we expect that customers will experience a number of negative and positive emotions during their interaction with the virtual advisor. These are proposed to be evoked as the result of experiencing or anticipating unpleasant events and outcomes (for the case of negative emotions), and experiencing or anticipating pleasant events and outcomes (for the case of positive emotions). First, when asked to answer socially sensitive questions, or when answering or deciding whether to answer these questions, the customer will likely experience a number of negative emotions. These emotions can be evoked when the customer is asked to disclose socially sensitive information that she prefers to keep private (e.g., irritation), primed about unpleasant events when asked to recall facts that relate to these events (e.g., anxiety), or feeling uneasy about sharing that information with another (e.g., embarrassment). Similarly, these negative emotions can also be evoked as a result of anticipating undesired outcomes, such as loss of privacy or loss of face.

In this study, we examine the role of a number of distinct negative emotions that can be evoked when socially sensitive information is elicited (primed) and provided, or when certain undesired outcomes are anticipated. Specifically, we focus on self-conscious emotions that can be evoked when providing socially undesirable self-disclosures, such as embarrassment, shame, and humiliation. These three emotions together indicate a shame index (Holbrook and Batra, 1987) and encompass personal standards with regard to acceptable thoughts, feelings, and actions (Lewis, 1993). In this study, we specifically focus on embarrassment, since while embarrassment involves a threat to the presented self as a result of negative evaluations from others, the other two are more fundamental in that they threaten the core self through failure to live up to an ideal (Bagozzi et al., 1999).

Also, we examine a set of negative emotions that can be evoked when customers are forced to think about unpleasant events, such as when being asked about health conditions, or when anticipating certain undesired outcomes. These include anxiety, distress, and nervousness, all of which could be evoked as a result of having to think about unpleasant situations that have some potentially undesired consequences (e.g., priming the customer on current health conditions can evoke feelings about undesired outcomes of these conditions in the future). We specifically focus on anxiety, which unlike the other two is more specific to a specific target than representing a general feeling of unease.

The final examined negative emotion is bother. This emotion has traditionally been included in an emotional index that represents anger, and indicates a person's unhappiness with a certain experience (Holbrook and Batra, 1987). In the context of this study, we believe that this emotion is evoked when the customer is repeatedly asked to provide information that he/she prefers to keep private, or when anticipating certain undesired outcomes, such as information mishandling.

When experiencing such negative emotions, the customer is said to be in disequilibrium (Bagozzi et al., 1999). To return to a normal state, the customer will likely use problem-focused coping to alleviate the source of these emotions, such as terminating the interaction with the virtual advisor, skipping the question, refusing to provide an answer, or providing inaccurate information. Alternatively, the customer may attempt to use emotion-focused

coping by changing the interpretation of the situation, such as thinking that the questions are not embarrassing or attributing good intentions to the advisor for asking these questions (Dahl et al., 2001). While problem-focused coping will likely lead to self-disclosure avoidance and/or falsification, emotion-focused coping will act to neutralize the effects of negative emotions on self-disclosure. Nonetheless, even if emotion-focused coping is used by customers who experience negative emotions, their self-disclosure will not exceed the levels of those who never experience such emotions. Thus, on average, experienced negative emotions as a result of self-disclosure will exert a negative effect on self-disclosure intentions and the subsequent disclosing behavior.

H1: Experienced negative emotions negatively influence the intentions to self-disclose.

H2: Experienced negative emotions negatively influence the intentions to provide accurate self-disclosures.

In this study, we propose that customers will experience a number of positive emotions during their interaction with the virtual advisor. For example, such positive emotions could be evoked as a result of satisfying one's curiosity and increased sense of exploration, being fully engrossed in the interaction, or anticipating positive outcomes such as healthier skin. To examine the effects of evoked positive emotions on self-disclosure intentions, we focus on perceived enjoyment. This construct has been repeatedly used in IS adoption research, and addresses the extent to which "the activity of using the [virtual advisor] is perceived to be enjoyable in its own right, apart from any performance consequences that may be anticipated" (Davis et al. 1992, p. 1113). It is considered an important antecedent to reuse intentions, especially when measuring the adoption and the continuous use of hedonic systems (Van der Heijden, 2004). Its most common conceptualizations address the extent to which the interaction is perceived as enjoyable, exciting, pleasant, and interesting.

In IS adoption research, perceived enjoyment has been closely linked to cognitive absorption and the state of flow. For example, Agarwal and Karahanna (2000) conceptualize heightened enjoyment as a dimension of cognitive absorption, a multi-dimensional construct that exerts positive influences on the perceived usefulness and ease of use of an information system. Similarly, Kamis, Koufaris and Stern (2008) argue that when using a virtual advisor, the user

may lose self-consciousness when immersed in the task. This immersion will likely result in increased enjoyment that subsequently increases the intentions to reuse the advisor and follow its recommendations.

The positive effects of enjoyable interactions on self-disclosure are consistent with the view of self-disclosure as an interpersonal behavior situated within an interaction (Antaki et al., 2005). When interactions become more enjoyable, the desire to maintain the relationship increases. Because self-disclosure acts as a conduit for relationship maintenance as suggested by the social penetration theory, increased self-disclosure is a likely result of interaction enjoyment. This prediction is consistent with Bagozzi et al.'s (1999) views on coping responses to positive emotions. Once positive emotions are evoked, the intention to increase and/or maintain the outcome increases. In the case of interactions with virtual advisors, maintaining that outcome represents reuse, which necessitates additional self-disclosures in the future. Further, in light of the expectation and desire for a prolonged relationship, the accuracy of self-disclosure should also increase.

H3: Experienced positive emotions positively influence the intentions to self-disclose.

H4: Experienced positive emotions positively influence the intentions to provide accurate self-disclosures.

3.2.3 The Role of Benefits and Costs in Evoking Negative and Positive Emotions

As described earlier, the positive and negative emotions experienced during the customer's interaction with the virtual advisor could be evoked by events that transpire during the interaction, and/or anticipated desired or undesired outcomes. In this study, these salient events and outcomes are represented by the perceived benefits and costs of self-disclosure. Specifically, the salient undesired outcomes that could be anticipated are represented by the two types of perceived costs examined in Study 1. As for the benefits, we view perceived performance expectancy to represent an expectation that a personalized skin care solution, and subsequently healthier skin, can be attained. The extent to which these two desired goals can be attained evokes the positive emotion of enjoyment. In this study, we also examine an additional perceived benefit of self-disclosure, namely novelty. This intrinsic benefit represents the attainment of the current outcome of satisfying one's curiosity.

Most appraisal theories of emotions propose a consistent mechanism of how stimulus events evoke emotions. In this stimulus → appraisal → arousal chain of events, a stimulus event (past, current or future) is evaluated for such things as its relevance, context, urgency, seriousness, and/or probability of occurrence for future events and outcomes. This evaluation then determines arousal as well as action tendencies. As described earlier, in the context of customer-virtual advisor interactions, a number of current and anticipated outcomes that are likely to evoke emotions are salient. For current outcomes, the extent to which they are attained represents the customer's evaluation. For anticipated outcomes, perceptions of the seriousness and the likelihood of occurrence, which we capture via perceptual measures of the benefits and costs, represents the evaluation.

As discussed at the onset of this section, negative emotions during customers' interactions with virtual advisors could be evoked as a result of experiencing unpleasant events, such as being asked embarrassing questions or recalling upsetting facts. In this study, these are not specifically examined since the number and type of the questions asked by the advisor are kept constant across subjects. Negative emotions could also be evoked in anticipation of undesired outcomes. In this study, these are represented by perceptions of the two costs of self-disclosure, namely loss of privacy and face. Specifically, when engaging in self-disclosure type of relationship, social approval and control are goals that are commonly sought (Derlega and Grzelak, 1979). When these goals are threatened, they have the potential for evoking negative emotions. Perceptions of loss of privacy represent the undesired outcome of information mishandling, which indicates failure to achieve control. Perceiving a greater likelihood⁹ of failure to achieve that goal (and thus obtaining the undesired outcome), we propose will evoke feelings of anxiety (unease when thinking about the potential undesired outcome), and bother (general unhappiness with the situation).

H5: Perceived loss of privacy positively influences experienced negative emotions.

Similarly, we believe that perceptions of loss of face represent an appraisal of the potential outcome that the customer will lose social approval. The emotional response resulting from

⁹ It is important to note that our discussion of how the costs of disclosure as undesired outcomes are appraised focuses on the probability (rather than the seriousness) of outcome attainment. This focus is justified by prior research. When examining the role of risk in affecting online purchase intentions, Glover and Benbasat (2009) found that the probability of risk rather than the expected harm drives customers' overall risk perceptions.

this appraisal will likely involve feelings of embarrassment due to the potential of negative evaluations from other, anxiety as the thought of this undesired outcome becomes salient, and bother due to general unhappiness with the situation.

H6: Perceived loss of face positively influences experienced negative emotions.

This study also examines the effects of two perceived benefits of self-disclosure on evoking positive emotion, specifically increased enjoyment. In so doing, we focus our attention on perceived performance expectancy, which represents the customer's appraisal of the likelihood of attaining a future positive outcome, and perceived novelty, which represents the customer's appraisal of the extent to which the desired direct outcome of satisfying his/her curiosity has been attained.

As proposed by Hui et al. (2006), novelty in the context of online shopping encompasses means that help customers fulfill their innate needs for exploration or information. Given the increasingly important role of the Internet as a source for information, this intrinsic benefit can in itself serve as a desired outcome that evokes positive emotions when achieved. Understandably, in the context of customer-advisor interactions, the extent to which positive affect is evoked will depend on the extent to which customers' curiosity is satisfied. In this study, we propose to capture novelty as a separate construct that represents one of the intrinsic benefits of self-disclosure.

Malone (1981) proposes curiosity as one of three categories of intrinsically motivating instruction, which ultimately contribute to increasing the pleasure attained from engaging in these activities. In Malone's theory, curiosity is separated into sensory and cognitive components, where cognitive curiosity is proposed to be aroused by making learners believe their knowledge structures are incomplete. In the context of this study, this is accomplished through being asked the series of questions about product attributes and relevant areas of one's life. Once this cognitive curiosity is satisfied, the instruction activity is perceived to be more fun. Similarly, Steenkamp and Baumgartner (1992) discuss the role of specific curiosity on customers' cognitive and affective responses. Highly curious people will seek new information, and will experience tedium when exposed to repetitive information.

H7: Perceived novelty positively influences experienced positive emotions.

As described earlier, this study also focuses on emotions that are evoked as a result of anticipating positive outcomes. In determining the nature of these emotions that will be evoked, it is important to first identify relevant goals. In this study, we propose that the goal of healthier skin serves as the ultimate goal customers seek when choosing to employ the virtual advisor. If healthier skin is the anticipated outcome being sought, then the perceived performance expectancy (the extent to which the advisor helps accomplish that goal) will serve as a major antecedent to the emotions that are evoked from the anticipation of achieving that outcome. In other words, perceived performance expectancy is essentially a sub-goal that moderates the extent to which that eventual goal of healthier skin is attained. Evoked anticipatory emotions in relation to these new outcomes can also affect goal-striving intentions and behaviors, such as, deciding to not self-disclose or providing false information. Therefore, perceptions of performance expectancy will positively affect the extent to which positive emotions are evoked.

At this point, it is important to highlight that the proposed role of performance expectancy mainly concerns the magnitude of these emotions (and to a lesser degree their valence), rather than whether these emotions will at all be evoked. This, as suggested by research by Luce and colleagues (e.g., Luce, 1998; Luce et al., 1997; 1999; 2000) will in part depend on the vividness of these anticipated outcomes.

H8: Perceived performance expectancy positively influences experienced positive emotions.

3.2.4 The Effects of Benefits and Costs on Self-Disclosure and Accuracy Intentions

Study 1 has provided evidence that perceived benefits and costs exert significant influences on the intentions to self-disclose. In this study, we introduce a new perceived benefit, namely perceived novelty. This benefit is also expected to exert a positive influence on self-disclosure intentions. Specifically, as highlighted by Hui et al. (2006), novelty is an intrinsic benefit that motivates customers to self-disclose in online context, since it helps them fulfill their innate needs for exploration or information. This fulfillment increases the desire to maintain and deepen the relationship, and therefore encourages further self-disclosure and enhances disclosure accuracy.

The remaining benefits and costs examined in this study have also been examined in Study 1. Their effects on self-disclosure intentions have been explained thoroughly in Chapter 2, and the mechanism through which they influence disclosure accuracy intentions, we propose, is similar to that explaining their effects on self-disclosure intentions.

At this point, it is important to note that by proposing that the perceived benefits and costs will also exert direct effects on self-disclosure intentions in addition to experienced emotions, we are essentially proposing that their effects on the two intentions are only partly mediated by the experienced emotions. In the context of our theoretical framework, this indicates that the experiential factors that are salient during self-disclosure episodes (experienced emotions in this case) are distinct, yet complementary to the rewards and costs of self-disclosures. This approach is no different than the one we adopted in Study 1, where both relational (relationship beliefs) and utilitarian (benefits and costs) factors were posited to be in effect.

H9(a): Perceived performance expectancy positively influences the intentions to self-disclose.

H9(b): Perceived performance expectancy positively influences the intentions to provide accurate self-disclosures.

H10(a): Perceived novelty positively influences the intentions to self-disclose.

H10(b): Perceived novelty positively influences the intentions to provide accurate self-disclosures.

H11(a): Perceived loss of privacy risk negatively influences the intentions to self-disclose.

H11(b): Perceived loss of privacy risk negatively influences the intentions to provide accurate self-disclosures.

H12(a): Perceived loss of face risk negatively influences the intentions to self-disclose.

H12(b): Perceived loss of face risk negatively influences the intentions to provide accurate self-disclosures.

3.2.5 The Moderating Roles of Self-Disclosure Depth and Customer Characteristics

As highlighted in the overview of this chapter, Study 2 further investigates the depth dimension of self-disclosure. Specifically, the study examines the moderating role of information type. In Omarzu's (2000) disclosure decision model, self-disclosure breadth is proposed to be driven more strongly by the subjective utility of disclosure, while the subjective risk drives disclosure depth. While the perceived utility of disclosures is determined by the salient rewards of self-disclosure, the subjective risk increases as the self-disclosure become more intimate (Cozby, 1973; Laurenceau, Barrett, and Pietromonaco, 1998). This effect has also been observed in the context of online privacy concerns (Malhotra, Kim, and Agarwal, 2004). In the context of this study, this implies that the perceived costs of self-disclosure should be expected to become more influential predictors of self-disclosure intentions when the information solicited is sensitive in nature.

Similarly, one should expect that the perceived benefits that determine the subjective utility of self-disclosures will become more influential when the sensitivity of the information solicited increases. Specifically, we reason that to outweigh the increased subjective risk that accompanies increased information sensitivity, the discloser needs to perceive increased benefits before self-disclosure occurs.

In this study, we also propose a more general moderating role of information type (disclosure depth). Specifically, we predict that based on the type of information solicited, the effects of both positive, and more particularly negative emotions, on self-disclosure and accuracy intentions will change. When soliciting sensitive information, the potential for evoking negative emotions increases. The increase in the magnitude of the experienced emotions will subsequently require increased coping efforts. As suggested earlier, one coping mechanism when asked to provide sensitive information that evokes strong negative emotions comes in the form of disclosure refusal and/or falsification. Similarly, when disclosing sensitive information, the stronger positive emotions are likely to exert a stronger effect on disclosure intentions as these disclosures inherently become more emotional in nature, and evoked positive emotion acts as a form of emotional coping that energizes goal striving behavior (Beaudry and Pinsonneault, 2010).

H13: Information type moderates the effects of the determinants of the intentions to self-disclose, where the effects of these determinants is expected to be larger when disclosing sensitive information compared to non-sensitive information .

H14: Information type moderates the effects of the determinants of the intentions to provide accurate self-disclosures, where the effects of these determinants is expected to be larger when disclosing sensitive information compared to non-sensitive information .

3.3 Research Method

A between-subjects fully-factorial experiment with three factors and eight treatment conditions was used to test the relationships depicted in Figure 5. Participants were randomly assigned (computer randomization) to one of the experimental groups. More details about the experimental procedure, treatment conditions, sample, and measures are provided below.

3.3.1 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. Yet, given that one of the dependent measures in the proposed model concerns how customers felt when disclosing, it was necessary to design a task that is taken seriously by subjects. Therefore, subjects were advised that they will be entered into a random draw to win one of six \$50 vouchers that can be redeemed against the purchase of the skin care product solution that is recommended by the virtual advisor.

During the task, the virtual advisor asked the subjects a total of thirty multiple-choice questions that are used to determine a customer's skin care needs. Similar to Study 1, the questions varied in their intimacy level, ranging from asking about demographics, to asking about sensitive habits and health conditions. Yet, given that the purpose of this study is to examine the role of evoked emotions on self-disclosure, more questions were added that focus on health-related issues and socially sensitive topics. Furthermore, subjects were asked to provide specific answers when applicable. For example, subjects indicating that they are

currently experiencing a chronic health condition(s) were asked to list these conditions. Table 10 lists the questions asked by the virtual advisor in the order they are asked.

After the shopping task, participants were asked to evaluate the virtual advisor and indicate the extent to which they experienced negative and positive emotions, as well as their willingness to disclose the elicited information to the advisor.

Table 10. Study 2 Virtual Advisor Script

#	Category	Question	
1	Skin care needs and type	What are your current concerns, and what you would like to accomplish at this stage?	<ul style="list-style-type: none"> • I want to see visible improvements to my skin • I'm happy with my skin but want to help it be the best it can be • I want to keep up with the most advanced skin care products
2	Skin care needs and type	What is your skin type?	<ul style="list-style-type: none"> • My skin is normal • My skin is sensitive
3	Skin care needs and type	How would you describe your skin?	<ul style="list-style-type: none"> • I would describe it as normal • I would describe it as oily • I would describe it as dry • I would describe it as oily in some parts and dry in others
4	Skin care needs and type	What area(s) of skin care you would like to focus on today?	<ul style="list-style-type: none"> • I would like to focus skin discoloration • I would like to focus lines or wrinkles • I would like to focus acne • I would like to focus dryness • I would like to focus general skin care
5	Specific skin conditions	Do you suffer from any of the following?	<ul style="list-style-type: none"> • Blackheads • Clogged pores • Droopy eyelids • Excessive sweating on the face • Liver spots • Pimples • Puffiness under the eyes • Skin rash • None
6	Specific skin conditions	Do you suffer from outbreaks of cold sores?	<ul style="list-style-type: none"> • Not at all • Yes, rarely (once every few months) • Yes, frequently (more than once a month)
7	Changes and experiences	Are there any changes going on in your life that might affect your skin?	<ul style="list-style-type: none"> • I have been experiencing hormonal changes • I have been experiencing weight changes • I have been experiencing health changes • I have been going through a period of "not enough me time" • I haven't been experiencing any changes
8	Demographics	Can you tell me your age?	<ul style="list-style-type: none"> • I am in my teens • I am in my 20's • I am in my 30's • I am in my 40's • I am in my 50's • I am in my 60's • I am in my 70's • I am in my 80's or over

Table 10. Study 2 Virtual Advisor Script (continued)

9	Demographics	Can you tell me your ethnicity?	<ul style="list-style-type: none"> • I'm Asian/Pacific Islander • I'm Black • I'm Caucasian • I'm Hispanic • Other
10	Skin care related habits	How would you describe your overall sun exposure/tanning habits?	<ul style="list-style-type: none"> • Low (less than 1 hour per week) • Moderate (1-4 hours per week) • High (more than 4 hours per week)
11	Demographics	Which Canadian Province/Territory do you currently reside in?	<ul style="list-style-type: none"> • Alberta • British Columbia • Manitoba • New Brunswick • Newfoundland and Labrador • Northwest Territories • Nova Scotia • Nunavut • Ontario • Prince Edward Island • Quebec • Saskatchewan • Yukon
12	Skin care related habits	How often you wash your face?	<ul style="list-style-type: none"> • I wash it sometimes, but not everyday • I wash it regularly. Maybe once or twice a day • I wash it very often. Typically more than twice a day
13	Skin care related habits	Do you wash your face with your hands, or something else like a washcloth?	<ul style="list-style-type: none"> • I use my hands • I use a washcloth
14	Skin care related habits	Do you currently use, or have you ever used, skin lighteners/whiteners?	<ul style="list-style-type: none"> • I have used them in the past, but not currently • I am currently using them • I have never used them
15	Socially sensitive habits	Do you smoke?	<ul style="list-style-type: none"> • I don't smoke at all • I rarely smoke • I smoke often • I don't currently smoke, but I smoked before
16	Socially sensitive habits	How would you describe your Alcohol consumption?	<ul style="list-style-type: none"> • I don't drink Alcohol • Low (less than 5 drinks a week) • Moderate (6 - 14 drinks a week) • High (more than 14 drinks a week)
17	Socially sensitive habits	Are you sexually active?	<ul style="list-style-type: none"> • Yes, I am • No, I am not
18	Medical history and health	Do you suffer from any allergies?	<ul style="list-style-type: none"> • I have food allergies (e.g., nuts) • I have seasonal allergies • I have environmental allergies (e.g., dust) • I have other types of allergies • I don't have an allergy

Table 10. Study 2 Virtual Advisor Script (continued)

19	Medical history and health	Do you suffer from a chronic health condition (e.g., diabetes, high blood pressure)? If yes, please specify.	<ul style="list-style-type: none">• No• Yes. Please specify:
20	Medical history and health	Do you take any prescription drugs? If yes, please specify.	<ul style="list-style-type: none">• No• Yes. Please specify:
21	Medical history and health	Do you take vitamins or other types of nutritional supplements, such as Iron, Copper, ...etc?	<ul style="list-style-type: none">• Yes, Vitamin A• Yes, B-complex (vitamins B1, B2, B3, B5, B6, B12 and folate)• Yes, Vitamin C• Yes, Iron• Yes, Copper• Other Vitamins and/or minerals• None
22	Medical history and health	Have you ever been diagnosed with a sexually transmitted disease (STD)? If yes, please specify.	<ul style="list-style-type: none">• No• Yes. Please specify:
23	Medical history and health	Have you recently completed electrolysis treatment to remove facial hair?	<ul style="list-style-type: none">• No• Yes
24	Medical history and health	Have you recently undergone a cosmetic procedure? This may include, but is not limited to Botox injections, minor or major plastic surgery, laser skin tightening ... etc. If yes, please specify.	<ul style="list-style-type: none">• No• Yes. Please specify:
25	Opinions on topics	What is your level of concern for the environment?	<ul style="list-style-type: none">• I would classify my concern for the environment as "low"• I would classify my concern for the environment as "moderate"• I would classify my concern for the environment as "high"
26	Opinions on topics	Do you oppose testing of skin care products on animals?	<ul style="list-style-type: none">• I don't particularly oppose it• I oppose it somewhat• I'm completely against it
27	Socially sensitive habits	Do you use birth control pills or any type of hormone therapy?	<ul style="list-style-type: none">• Yes, I use birth control pills• Yes, I use hormone therapy/replacement• Yes, I use both of them• No, I don't use either
28	Changes and experiences	Which of the following are you currently going through?	<ul style="list-style-type: none">• Puberty• Pregnancy• Perimenopause• Menopause• None of the above

Table 10. Study 2 Virtual Advisor Script (continued)			
29	Changes and experiences	How would you describe your menstrual cycle?	<ul style="list-style-type: none"> • Monthly and Regular • Monthly but Irregular • Not monthly but Regular • Not monthly and Irregular • Other • I don't experience a menstrual cycle
30	Changes and experiences	Which of the following describe what you would typically experience during your menstruation and menstrual cycle?	<ul style="list-style-type: none"> • Bleeding pattern: heavy flow • Bleeding pattern: prolonged bleeding (more than 7 days) • Bleeding pattern: shortened bleeding (less than 3 days) • Emotional reactions: PMS • Emotional reactions: mood swings • Emotional reactions: weepiness • Emotional reactions: depression • Emotional reactions: emotional sensitivity • Physical sensations: cramps • Physical sensations: abdominal pain • Physical sensations: nausea • Physical sensations: migraine headaches • Physical sensations: feeling bloated • Physical sensations: changes in sex drive • Physical sensations: breast swelling and discomfort • Physical sensations: changes in appetite • I menstruate but I don't experience any of the above • I do not menstruate

3.3.2 *Sample*

The study was conducted on-line using participants recruited from an e-commerce panel maintained by an Internet market research company. An invitation to participate in the study was broadcast via email to members of the panel. Participants were provided with a point-based incentive redeemable for various prizes. Similar to Study 1, the sample was comprised only of females. However, approximately only half the sample, 98 subjects, consisted of females representing the general population of female Internet users. Another ninety-seven subjects were chosen from a more specialized pool of subjects, who have experienced skin or other health conditions, and/or exhibit socially undesirable characteristics (e.g., smoking). The characteristics of the pooled sample are described in Table 11.

Table 11. Study 2 Sample Characteristics		
	# Participants	Percentage
Age		
19 - 24	23	11.8
25 - 34	61	31.3
35 - 44	48	24.6
45 -54	41	21.0
55 - 64	15	7.7
65+	7	3.6
Annual Household Income		
No Response	2	1.0
Less than \$30,000	37	19.0
\$30,000 - \$49,999	47	24.1
\$50,000 - \$74,999	54	27.7
\$75,000 - \$99,999	31	15.9
Equal or more than \$100,000	24	12.3
Employment Status		
Employed full-time	102	52.3
Employed part-time	37	19.0
Retired	16	8.2
Unemployed	40	20.5
Educational Level		
College or graduate school degree	111	56.9
High school graduate	32	16.4
Not a high school graduate	4	2.1
Some college	48	24.6
Marital Status		
In a relationship	48	24.6
Married	87	44.6
Single	53	27.2
Widowed	6	3.1

3.3.3 Treatment Conditions

The choice of experimental manipulations were motivated by our discussion in Study 1, and the results that were obtained, concerning the effects of design characteristics on perceptions of the advisor's characteristics, and subsequently the perceived benefits and costs. The results obtained in Study 1 revealed that the use of *why* and dynamic *how* explanations as well as

expressive speech acts is sufficient to manifest desired characteristics on the part of the advisor, such as transparency and responsiveness. These perceived characteristics subsequently affect perceptions of the perceived benefits and costs.

Based on the above analysis, eight advisors were designed that differed in whether they used *why* explanations (first factor), dynamic *how* explanations (second factor) and expressive speech acts (third factor). The general design of the advisor used in this study matched that one used in Study 1, which is depicted in Table 5. Table 12 describes the design elements for the advisors used in each of the treatment conditions.

Table 12. Study 2 Treatment Advisors and Design Elements								
Design Element	Treatment Advisor							
	1	2	3	4	5	6	7	8
<i>Why</i> Explanations		X		X		X		X
<i>How</i> Explanations			X	X			X	X
Expressive Speech Acts					X	X	X	X

3.3.4 Measures

All constructs used in this study were measured using multi-item scales (all items are listed in Table 13). A new scale was developed to measure perceived benefit of novelty. Experienced negative emotions were measured using a multi-item scale indicated by the three emotions “embarrassed”, “anxious”, and “bothered”. These three emotions were captured separately for each type of information solicited (see below for a list of the types of information solicited). In other words, subjects were asked to indicate the extent to which they experienced each of these emotions when they were asked to provide demographical information, information about sensitive habits ... etc.

Perceived enjoyment, the experienced positive emotions construct, was measured using an established scale that was previously used within the context of interactions with virtual advisors (Al-Natour et al., 2011). The scale measuring perceived enjoyment was general in nature, and focused on the experienced enjoyment throughout the interaction rather than when asked questions about specific types of information. This choice was made since the

experienced enjoyment is proposed to be evoked by novelty stimulation rather than the requests for self-disclosure, and thus should not vary with the type of information solicited.

Similar to Study 1, the intention to self-disclose and the accuracy of the intended disclosures were captured separately for different types of information. As described earlier, the advisor asked a total of thirty multiple-choice questions. These were grouped into the following eight information categories (the classification of each question is shown in Table 10): 1) demographics (e.g., age, ethnicity, residency), 2) skin care needs and type (e.g., skin type, what you would like to accomplish), 3) specific skin conditions (e.g., cold sores, pimples, ...etc), 4) skin care related habits (e.g., sun exposure, face washing), 5) socially sensitive habits (e.g., smoking, sexual activity, alcohol consumption, 6) changes and experiences (e.g., changes you're going through, use of birth control pills, menstrual cycle), 7) medical history and health-related information (e.g., chronic conditions, prescription drugs, use of supplements, STDs, cosmetic procedures, electrolysis), and 8) opinions on topics (e.g., concern for the environment, animal testing).

Table 13. Study 2 Measurement Items

	S. L.	Mean	S. D.
<i>Benefits and Costs: 7-point Likert Scale (Strongly disagree - Strongly agree):</i>			
Loss of Privacy (Adapted from White, 2004): Cronbach's Alpha = 0.91			
1. Revealing this information to the Shopping Assistant could result in a loss of control over who knows what about me.	0.91	3.58	1.81
2. Revealing this information to the Shopping Assistant could result in an increase in solicitations from the online vendor.	0.89	3.97	1.67
3. Revealing this information to the Shopping Assistant could result in me losing my privacy.	0.95	3.89	1.77
Loss of Face (Adapted from White, 2004): Cronbach's Alpha = 0.94			
1. Revealing this information to the Shopping Assistant could be embarrassing.	0.93	3.71	1.80
2. Revealing this information to the Shopping Assistant could make others evaluate me negatively.	0.96	3.26	1.74
3. Revealing this information to the Shopping Assistant could result in me losing face.	0.95	2.95	1.56
Performance Expectancy (Adapted from Venkatesh et al., 2003): Cronbach's Alpha = 0.96			
1. Revealing this information to the Shopping Assistant would help me get a better product(s).	0.94	5.17	1.56
2. Revealing this information to the Shopping Assistant would increase the likelihood that the recommended product(s) fits my individual needs.	0.98	5.42	1.46
3. Revealing this information to the Shopping Assistant could ensure that the recommended product(s) is personalized to my situation.	0.98	5.52	1.45
Novelty (newly developed scale based on the definition in Hui et al., 2006): Cronbach's Alpha = 0.91			
1. Revealing this information to the Shopping Assistant involves a sense of exploration.	0.73	4.51	1.35
2. Revealing this information to the Shopping Assistant involves a sense of novelty.	0.75	4.20	1.29
3. Revealing this information to the Shopping Assistant allows me to explore new products.	0.88	5.13	1.25
4. Revealing this information to the Shopping Assistant helps me to satisfy my curiosity.	0.88	4.64	1.40
5. Revealing this information to the Shopping Assistant helps me to fulfill my informational needs.	0.86	4.83	1.28
6. Revealing this information to the Shopping Assistant helps me to explore unfamiliar domains.	0.84	4.56	1.35

Table 13. Study 2 Measurement Items (continued)

	S. L.	Mean	S. D.
Perceived Enjoyment (Adapted from Al-Natour et al., 2011): Cronbach's Alpha = 0.93			
1. Enjoyable	0.94	4.98	1.32
2. Exciting	0.86	4.17	1.34
3. Pleasant	0.94	5.10	1.23
4. Interesting	0.90	5.42	1.23

Negative Emotions:

	Embarrassed			Anxious			Bothered			Alpha
	S. L.	Mean	S. D.	S. L.	Mean	S. D.	S. L.	Mean	S. D.	
1. Skin care needs and type	0.90	1.48	0.88	0.92	1.53	0.99	0.88	1.44	0.79	0.88
2. Specific skin conditions	0.91	1.77	1.14	0.94	1.66	1.11	0.93	1.56	0.94	0.91
3. Demographics	0.90	1.51	0.85	0.93	1.57	1.00	0.95	1.60	1.03	0.91
4. Skin care related habits	0.89	1.68	1.09	0.95	1.69	1.18	0.88	1.53	0.90	0.88
5. Sensitive habits	0.88	2.53	1.61	0.91	2.07	1.45	0.88	2.22	1.54	0.87
6. Medical history and health-related information	0.92	2.50	1.65	0.92	2.25	1.64	0.92	2.34	1.70	0.91
7. Changes and experiences	0.92	2.34	1.54	0.90	2.09	1.45	0.92	2.16	1.48	0.90
8. Opinions about certain topics	0.90	1.74	1.11	0.91	1.82	1.28	0.90	1.74	1.22	0.88

Self-Disclosure Intentions: 7-point Likert Scale (Very unlikely - Very likely):

Intention to Self-disclose:	Mean	S. D.
1. Skin care needs and type (your skin type, what you would like to accomplish)	6.54	0.81
2. Specific skin conditions (cold sores, pimples, ...etc)	6.48	0.87
3. Demographics (age, ethnicity, Province of residence)	6.22	1.17
4. Skin care related habits (sun exposure, face washing)	6.47	0.85
5. Sensitive habits (smoking, sexual activity, alcohol consumption)	5.85	1.43
6. Medical history and health-related information (chronic conditions, prescription drugs, use of supplements, STDs, cosmetic procedures, electrolysis)	5.59	1.63
7. Changes and experiences (changes you're going through, use of birth control pills, menstrual cycle)	5.86	1.41
8. Opinions about certain topics (concern for the environment, animal testing)	6.17	1.16

Table 13. Study 2 Measurement Items (continued)

Intention to Self-disclose Accurately:	Mean	S. D.
1. Skin care needs and type (your skin type, what you would like to accomplish)	6.69	0.78
2. Specific skin conditions (cold sores, pimples, ...etc)	6.63	0.82
3. Demographics (age, ethnicity, Province of residence)	6.53	0.94
4. Skin care related habits (sun exposure, face washing)	6.58	0.81
5. Sensitive habits (smoking, sexual activity, alcohol consumption)	6.13	1.31
6. Medical history and health-related information (chronic conditions, prescription drugs, use of supplements, STDs, cosmetic procedures, electrolysis)	6.05	1.47
7. Changes and experiences (changes you're going through, use of birth control pills, menstrual cycle)	6.24	1.25
8. Opinions about certain topics (concern for the environment, animal testing)	6.39	1.16

3.4 Results

3.4.1 *Measurement Model and Manipulation Checks*

Factor and reliability analyses were conducted using the Statistical Package for the Social Sciences (SPSS). Construct reliability estimates (Cronbach's Alpha) and item standardized loadings are shown in Table 13. All scales showed a high level of reliability, and item loadings exceeded the recommended minimum of 0.70.

As described in Chapter 2, and consistent with Al-Natour and Benbasat's (2009) belief hierarchy of effects, design elements should not be expected to exert direct effects on the perceived benefits and costs. Their effects however, are mediated by the object-based beliefs. To examine whether the treatment conditions had effects on manifesting desired advisor characteristics that influence perceptions of benefits and costs, we conducted some additional analysis. Table 35 and Table 36 in Appendix C describe the effects of the treatment conditions on some object-based beliefs, namely, perceived transparency, perceived expressiveness, perceived rapport, and perceived responsiveness. These beliefs were shown to affect self-disclosure benefits and cost in Study 1. As could be observed in Table 35, the mean scores for all object-based beliefs varied significantly across the different treatment conditions. The ANOVA results depicted in Table 36 revealed that the three design elements exerted positive and statistically significant effects on perceptions of transparency, expressiveness, rapport, and responsiveness. The only two exceptions were that the use of why explanations had no effect on enhancing perceptions of rapport, and the use of expressive speech acts had no effect on perceived transparency of the advisor.

On the other hand, we also performed some analysis to check whether the treatment conditions were able to create variances in the scores for the perceived benefits and costs. Table 14 depicts the mean scores and standard deviation that we computed for each of the construct examined in this study. The results reveal reasonable variation in the mean scores across the different treatment groups. Overall, the treatments were successful in creating sufficient variances in the scores of the exogenous variables. These had relatively high variances overall, enabling an examination of the structural model. The correlations between the different constructs are shown in Table 15.

Table 14. Study 2 Descriptive Statistics

Treatment Group Construct	1 N = 20		2 N = 25		3 N = 30		4 N = 29		5 N = 25		6 N = 22		7 N = 21		8 N = 23		Total N = 195	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Loss of Privacy	3.58	1.32	4.33	1.57	3.82	1.91	3.53	1.67	4.24	1.62	3.71	1.50	3.76	1.62	3.48	1.47	3.81	1.61
Loss of Face	3.08	1.43	3.75	1.76	3.43	1.81	2.90	1.60	3.68	1.49	3.12	1.47	3.29	1.61	3.19	1.57	3.31	1.60
Performance Expectancy	5.45	1.03	5.33	1.51	5.16	1.70	5.43	1.76	5.16	1.65	5.86	0.89	5.05	1.44	5.59	0.97	5.37	1.44
Novelty	4.73	0.93	4.65	1.10	4.57	1.40	5.16	0.81	4.45	1.07	4.47	1.12	4.33	1.28	4.67	0.70	4.64	1.09
Perceived Enjoyment	4.11	0.96	4.62	1.01	4.99	1.19	5.48	0.93	4.58	1.54	5.16	0.93	5.13	1.01	5.09	1.17	4.92	1.16
N. Emotions - Skin needs	1.45	0.80	1.35	0.60	1.64	1.00	1.33	0.61	1.72	0.94	1.29	0.74	1.63	0.87	1.42	0.70	1.48	0.80
N. Emotions - Skin cond.	1.63	0.97	1.64	1.07	1.80	1.07	1.51	0.91	1.97	1.05	1.50	1.16	1.68	0.86	1.54	0.73	1.66	0.98
N. Emotions - Demographic	1.50	0.75	1.48	0.85	1.73	1.00	1.48	0.86	1.77	1.02	1.29	0.72	1.68	1.00	1.49	0.84	1.56	0.89
N. Emotions - Skin habits	1.80	0.98	1.60	1.00	1.87	1.16	1.41	0.78	1.91	1.06	1.42	0.89	1.60	0.87	1.43	0.74	1.63	0.95
N. Emotions - Sensitive hab.	2.27	1.20	2.71	1.62	2.51	1.48	1.99	1.14	2.60	1.68	1.95	1.36	2.16	1.14	1.91	1.00	2.27	1.36
N. Emotions - Medical	2.42	1.43	2.55	1.61	2.77	1.74	2.05	1.29	2.71	1.80	2.00	1.43	2.40	1.33	1.93	1.39	2.36	1.53
N. Emotions - Changes	2.30	1.15	2.36	1.51	2.50	1.69	1.91	0.97	2.52	1.70	1.97	1.38	2.03	1.13	1.93	1.06	2.20	1.36
N. Emotions - Opinions	1.68	1.01	1.75	1.27	1.84	1.11	1.47	0.66	2.25	1.33	1.83	1.33	1.78	0.94	1.54	0.81	1.77	1.08
Disclosure In. - Skin needs	6.50	0.89	6.64	0.57	6.53	1.17	6.69	0.60	6.48	0.82	6.64	0.58	6.48	0.75	6.35	0.89	6.54	0.81
Disclosure In. - Skin cond.	6.45	0.89	6.60	0.58	6.43	1.19	6.72	0.53	6.24	1.20	6.59	0.67	6.38	0.74	6.35	0.83	6.48	0.87
Disclosure In. - Demographic	6.30	1.03	6.36	1.15	6.20	1.24	6.48	0.95	6.04	1.34	6.00	1.38	6.00	1.05	6.30	1.19	6.22	1.17
Disclosure In. - Skin habits	6.30	1.08	6.44	0.71	6.43	1.17	6.66	0.61	6.48	0.77	6.50	0.74	6.48	0.75	6.39	0.84	6.47	0.85
Disclosure In. - Sensitive hab.	5.85	1.14	5.88	1.36	5.43	1.81	6.10	1.40	5.76	1.56	5.91	1.38	5.90	1.45	6.04	1.11	5.85	1.43
Disclosure In. - Medical	5.65	1.23	5.80	1.41	5.30	2.04	6.00	1.56	5.56	1.69	5.73	1.52	5.24	1.92	5.43	1.47	5.59	1.63
Disclosure In. - Changes	5.90	1.17	5.76	1.45	5.40	1.99	6.45	0.74	5.72	1.51	5.95	1.36	5.76	1.34	5.96	1.15	5.86	1.41
Disclosure In. - Opinions	6.35	0.81	6.04	1.49	6.00	1.46	6.52	0.83	5.96	1.31	5.95	1.21	6.10	0.94	6.48	0.79	6.17	1.16
Accuracy In. - Skin needs	6.60	1.14	6.76	0.52	6.63	1.13	6.72	0.70	6.72	0.68	6.82	0.40	6.62	0.67	6.61	0.72	6.69	0.78
Accuracy In. - Skin cond.	6.60	1.14	6.76	0.52	6.57	1.14	6.66	0.77	6.52	0.82	6.82	0.40	6.52	0.68	6.57	0.79	6.63	0.82
Accuracy In. - Demographic	6.60	0.75	6.60	0.82	6.60	1.13	6.59	0.87	6.40	1.19	6.55	0.91	6.38	0.92	6.48	0.90	6.53	0.94
Accuracy In. - Skin habits	6.45	1.00	6.68	0.63	6.47	1.20	6.62	0.78	6.60	0.71	6.68	0.48	6.62	0.67	6.52	0.79	6.58	0.81
Accuracy In. - Sensitive hab.	6.25	0.97	6.04	1.34	5.97	1.56	6.14	1.33	5.92	1.66	6.32	1.00	6.05	1.47	6.48	0.90	6.13	1.31
Accuracy In. - Medical	6.15	1.09	6.24	1.17	5.97	1.69	6.10	1.50	5.88	1.67	6.23	1.38	5.81	1.78	6.00	1.45	6.05	1.47
Accuracy In. - Changes	6.35	1.23	6.32	0.95	6.00	1.68	6.41	0.91	6.04	1.51	6.45	0.96	5.90	1.55	6.43	0.95	6.24	1.25
Accuracy In. - Opinions	6.45	1.23	6.40	1.23	6.27	1.44	6.52	0.83	6.08	1.50	6.55	0.96	6.33	1.02	6.57	0.90	6.39	1.16

Table 15. Study 2 Construct Correlations

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1 LP	-																											
2 LF	.770**																											
3 PE	-.191**	-.340**																										
4 NO	-.198**	-.273**	.454**																									
5 POE	-.194**	-.251**	.334**	.441**																								
6 NEE_1	.273**	.295**	-.186**	-.175*	-.250**																							
7 NEE_2	.294**	.334**	-0.103	-0.118	-.236**	.833**																						
8 NEE_3	.304**	.285**	-.180*	-.150*	-.224**	.814**	.720**																					
9 NEE_4	.305**	.327**	-0.109	-0.104	-.275**	.832**	.841**	.734**																				
10 NEE_5	.504**	.567**	-.213**	-.290**	-.300**	.510**	.602**	.491**	.617**																			
11 NEE_6	.529**	.630**	-.250**	-.281**	-.258**	.474**	.567**	.470**	.580**	.832**																		
12 NEE_7	.446**	.526**	-.240**	-.362**	-.312**	.539**	.634**	.514**	.648**	.827**	.804**																	
13 NEE_8	.353**	.398**	-.221**	-.297**	-.316**	.694**	.680**	.641**	.741**	.691**	.645**	.678**																
14 DI_1	-0.064	-.156*	.237**	.211**	.347**	-.353**	-.309**	-.328**	-.294**	-.215**	-.177*	-.244**	-.269**															
15 DI_2	-.145*	-.221**	.263**	.286**	.404**	-.422**	-.372**	-.379**	-.323**	-.296**	-.257**	-.326**	-.330**	.892**														
16 DI_3	-.257**	-.268**	.304**	.336**	.316**	-.331**	-.296**	-.478**	-.290**	-.285**	-.297**	-.337**	-.255**	.721**	.715**													
17 DI_4	-0.126	-.205**	.244**	.231**	.367**	-.338**	-.319**	-.368**	-.341**	-.272**	-.251**	-.324**	-.295**	.934**	.839**	.753**												
18 DI_5	-.351**	-.447**	.461**	.421**	.340**	-.247**	-.188**	-.228**	-.227**	-.480**	-.437**	-.485**	-.301**	.469**	.506**	.572**	.537**											
19 DI_6	-.427**	-.542**	.500**	.526**	.349**	-.232**	-.192**	-.237**	-.185**	-.494**	-.597**	-.463**	-.341**	.396**	.461**	.536**	.438**	.761**										
20 DI_7	-.358**	-.476**	.488**	.519**	.419**	-.283**	-.256**	-.310**	-.248**	-.461**	-.495**	-.616**	-.357**	.480**	.531**	.626**	.549**	.818**	.754**									
21 DI_8	-.272**	-.383**	.460**	.399**	.431**	-.346**	-.324**	-.387**	-.331**	-.382**	-.375**	-.418**	-.530**	.588**	.598**	.640**	.617**	.671**	.595**	.705**								
22 DA_1	-0.019	-0.126	.210**	.152*	.289**	-.234**	-.210**	-.187**	-.205**	-.150*	-0.108	-.176*	-.166*	.837**	.708**	.593**	.825**	.370**	.358**	.393**	.500**							
23 DA_2	-0.101	-.197**	.234**	.210**	.328**	-.296**	-.284**	-.249**	-.267**	-.254**	-.217**	-.267**	-.232**	.786**	.760**	.612**	.784**	.429**	.451**	.448**	.538**	.939**						
24 DA_3	-.161*	-.179*	.259**	.278**	.277**	-.262**	-.248**	-.390**	-.216**	-.222**	-.213**	-.265**	-.187**	.691**	.691**	.808**	.679**	.442**	.432**	.448**	.576**	.696**	.732**					
25 DA_4	-0.140	-.234**	.259**	.197**	.324**	-.245**	-.278**	-.243**	-.311**	-.271**	-.260**	-.299**	-.245**	.753**	.659**	.606**	.792**	.454**	.460**	.478**	.562**	.884**	.889**	.690**				
26 DA_5	-.353**	-.410**	.402**	.364**	.360**	-.176*	-.147*	-.166*	-.178*	-.531**	-.423**	-.453**	-.265**	.427**	.454**	.499**	.469**	.710**	.642**	.622**	.561**	.479**	.556**	.555**	.581**			
27 DA_6	-.341**	-.471**	.411**	.389**	.342**	-.168*	-.171*	-.181*	-.174*	-.491**	-.561**	-.467**	-.336**	.413**	.450**	.514**	.434**	.617**	.784**	.613**	.546**	.475**	.575**	.539**	.586**	.813**		
28 DA_7	-.319**	-.429**	.447**	.417**	.401**	-.212**	-.235**	-.252**	-.236**	-.449**	-.477**	-.524**	-.360**	.489**	.516**	.588**	.528**	.616**	.657**	.735**	.653**	.566**	.650**	.604**	.681**	.820**	.840**	
29 DA_8	-.244**	-.349**	.363**	.289**	.347**	-.184*	-.210**	-.220**	-.248**	-.366**	-.342**	-.395**	-.392**	.588**	.541**	.574**	.587**	.553**	.540**	.606**	.666**	.699**	.631**	.719**	.735**	.721**	.852**	

LP: Perceived Loss of Privacy LF: Perceived Loss of Face PE: Perceived Performance Expectancy NO: Perceived Novelty POE: Positive Emotions NEE_1: Negative Emotions - Skin care needs and type NEE_2: Negative Emotions - Specific skin conditions NEE_3: Negative Emotions - Demographics NEE_4: Negative Emotions - Skin care related habits NEE_5: Negative Emotions - Sensitive habits NEE_6: Negative Emotions - Medical history and health NEE_7: Negative Emotions - Changes and experiences NEE_8: Negative Emotions - Opinions about certain topics DI_1: Disclosure Intentions - Skin care needs and type DI_2: Disclosure Intentions - Specific skin conditions DI_3: Disclosure Intentions - Demographics DI_4: Disclosure Intentions - Skin care related habits DI_5: Disclosure Intentions - Sensitive habits DI_6: Disclosure Intentions - Medical history and health DI_7: Disclosure Intentions - Changes and experiences DI_8: Disclosure Intentions - Opinions about certain topics DA_1: Accuracy Intentions - Skin care needs and type DA_2: Accuracy Intentions - Specific skin conditions DA_3: Accuracy Intentions - Demographics DA_4: Accuracy Intentions - Skin care related habits DA_5: Accuracy Intentions - Sensitive habits DA_6: Accuracy Intentions - Medical history and health DA_7: Accuracy Intentions - Changes and experiences DA_8: Accuracy Intentions - Opinions about certain topics

** Correlation significant at $p < 0.01$

* Correlation significant at $p < 0.05$

3.4.2 *Structural Model Results*

To test our hypotheses, we analyzed a structural model using Partial Least Squares (PLS) with SmartPLS 2.0 (Ringle, Wende, & Will, 2005). In this model, and consistent with our earlier discussion, experienced emotions were assumed to only partially mediate the effects of the perceived benefits and costs on self-disclosure and accuracy intentions. As a result, both the direct effects of benefits and costs on the respective types of emotions were examined, as well as their direct effects on self-disclosure and accuracy intentions¹⁰. In the model, the mean scores of constructs were used as indicators.

Similar to the structural model that was analyzed in Study 1, the intentions to self-disclose construct was modeled as a second-order construct reflected by the items measuring the intentions to disclose different types of information. The intentions to provide accurate information was similarly modeled as a second-order construct.

The construct of negative emotions was modeled as second-order construct reflected by the overall negative emotions experienced when different types of information were solicited. Mean scores were computed for the three distinct emotion items captured for each information type. The mean scores were subsequently used as the indicators for the second-order construct. For instance, the scores for the items “embarrassed”, “anxious” and “bothered” were averaged to compute a mean score of negative emotions experienced when asked about medical and health information. This score was subsequently used as one of the indicators for the negative emotions second-order construct.

The results of the structural model, including standardized path coefficients and the corresponding significant values, are depicted in shown in Figure 6. Standard errors were computed using a bootstrap procedure with 500 resamples. To confirm that the results obtained are not an artifact of our modeling choices, we also analyzed an additional model in which the negative emotions and the two intentions constructs were modeled as formative constructs. Table 16 compares the results from this additional model to those depicted in

¹⁰ Table 37 in Appendix C depicts the results of an equivalent structural model that was analyzed where experienced emotions were assumed to fully mediate the effects of the perceived costs and benefits on disclosure and accuracy intentions. As a result, only the two types of experienced emotions acted as determinants to the two disclosure intention constructs. The results obtained from that model are similar to those of the non-mediated model.

Figure 6. Generally, the results were similar, and there was only one case in which the statistical significance of an effect changed between the two models.

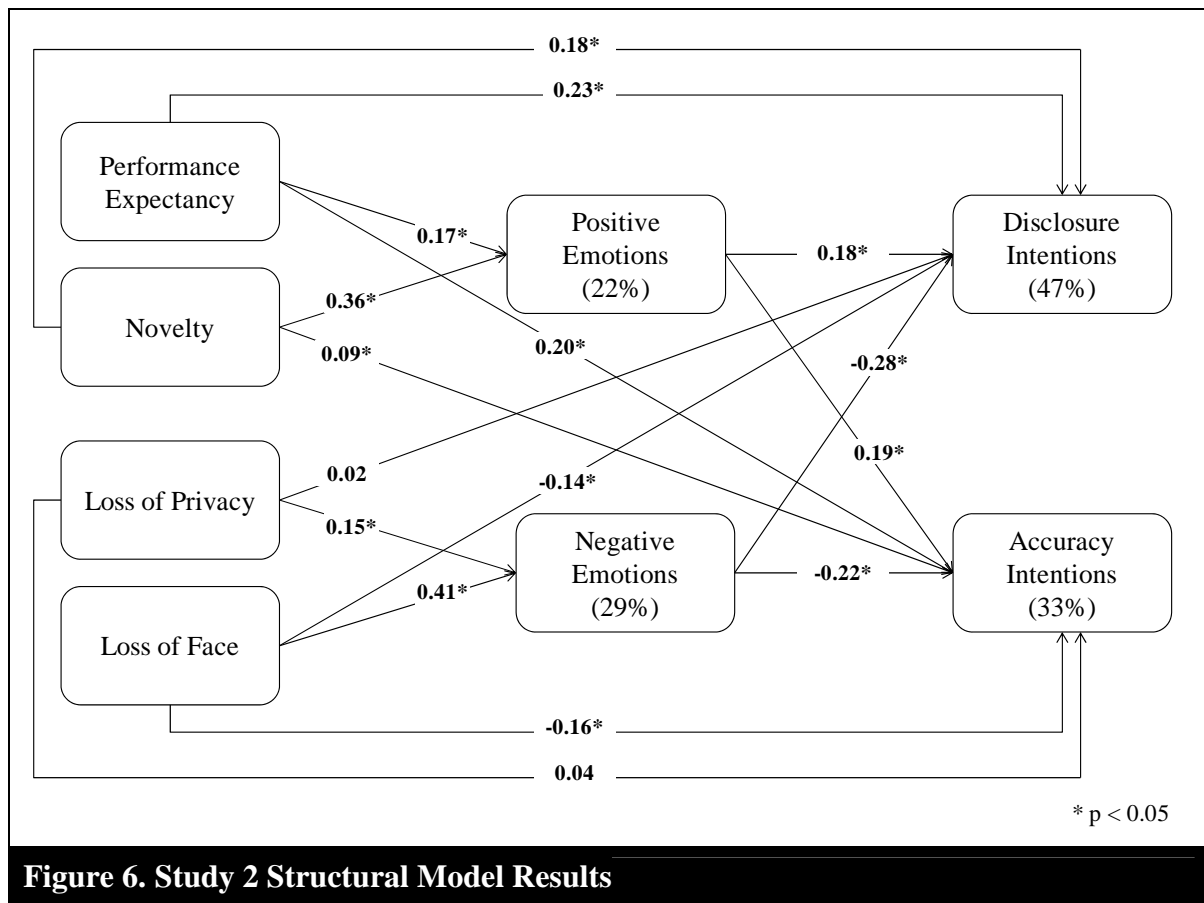


Figure 6. Study 2 Structural Model Results

To test hypotheses 13 and 14, two additional structural models were analyzed. Given that this study examines eight distinct types of information captured via two facets of self-disclosure (i.e., self-disclosure and accuracy intentions), examining the moderation effects of the relationship between the four distinct antecedents and the sixteen dependent variables is impractical. Instead, the eight information types were categorized into two groups of “sensitive” and “non-sensitive” information. This categorization was anchored in past literature on the different types of self-disclosure (e.g., (Berg and Archer, 1980; Omarzu, 2000), and findings from Study 1 concerning the perceived sensitivity of each type of information solicited by the virtual advisor. Specifically, the first four types of information (i.e., skin care needs and type, specific skin conditions, demographics, and skin care related habits) were categorized as non-sensitive because their relationship to the task is obvious

and/or are descriptive in type. Sensitive information included the other four types of information solicited (i.e., sensitive habits, medical history and health-related information, changes and experiences, and opinions about certain topics). These concern information that is unobservable and/or evaluative in nature.

In the two models, experienced negative emotions, the intentions to self-disclose, and the intentions to provide accurate disclosures were modeled as second-order construct reflected by four indicators. Each of these indicators represented the experienced emotions, intentions to disclose, or the intentions to provide accurate information for the four types of information under the specified category (sensitive or non-sensitive information). The results from the two models are shown in Table 17¹¹.

Two additional models were also analyzed, where the experienced negative emotions and the two second-order intentions constructs were each modeled as a second-order formative constructs. These additional models were analyzed to ensure that the obtained results are consistent regardless of our modeling choices. The results from the four models are also shown in Table 17.

The results of the hypothesis testing are summarized in Table 18. Consistent with hypotheses 1 and 2, negative emotions had a negative effect on the intentions to self-disclose ($\beta = -0.28$, $p < 0.05$) and the intentions to provide accurate disclosures ($\beta = -0.22$, $p < 0.05$). These effects held for all types of both sensitive and non-sensitive information as shown in Table 17.

Similarly, the results shown in Figure 6 indicated that experienced positive emotions exerts positive effects on the two intentions ($\beta = 0.18$, $p < 0.05$ on the intentions to self-disclose, and $\beta = 0.19$, $p < 0.05$ on the intentions to disclose accurate information). These effects of positive emotions were consistent whether the intentions concerned sensitive or non-sensitive information. Hence, hypotheses 3 and 4 are both supported.

¹¹ Table 38 and Table 39 in Appendix C depict the results of the structural models when each of the different type of information solicited is modeled independently.

Lending full support to hypotheses 5 and 6, the results further revealed the two types of costs exert positive effects on the experienced negative emotions. The effect of loss of face ($\beta = 0.41, p < 0.05$) were noticeably larger than those of loss of privacy ($\beta = 0.15, p < 0.05$). Yet, both effects were statistically significant whether the intentions concerned sensitive or non-sensitive information.

As described earlier, positive emotion was captured in this study independent of the type of information solicited. The main reason for doing so was that it is unlikely that positive emotion is evoked as a result of being asked a specific question, or anticipating a positive outcome as a result of being asked a specific a question. Instead, we reasoned that positive emotions will either be evoked as a result of enhanced interaction enjoyment or the anticipation of positive outcomes as a result of the interaction. Hence, the effects of perceived benefits on positive emotion were assumed to be constant regardless of the type of information solicited. Consequently, to test for the two hypotheses concerning the relationship between the two perceived benefits and positive emotions, one needs to look at any of the models overviewed in Figure 6, Table 16, or Table 17. Our examination revealed that both hypotheses 7 and 8 were fully supported, where perceived performance expectancy and perceived novelty both exerted positive and statistically significant effects on evoked positive emotions ($\beta = 0.17, p < 0.05$; $\beta = 0.36, p < 0.05$, respectively).

The results concerning the effects of perceived benefits and costs on the two intentions dependent variables were mixed. As shown in Figure 6, perceived performance expectancy had positive and statistically significant effects on both the intentions to disclose and the intentions to provide accurate information ($\beta = 0.23, p < 0.05$; $\beta = 0.20, p < 0.05$, respectively). These effects were statistically significant when disclosing both sensitive and non-sensitive information. Thus, hypotheses 9a and 9b were both supported.

Similarly, the effects of perceived novelty on the two intentions variables were positive and statistically significant ($\beta = 0.18, p < 0.05$; $\beta = 0.09, p < 0.05$, respectively). However, as shown in Table 17, perceived novelty's effect on the intentions to disclose accurately was statistically insignificant when the information solicited is non-sensitive in nature, and specifically when that intention variable is modeled as a second-order reflective construct

($\beta = 0.04$, $p > 0.10$). Hence, while hypothesis 10a is fully supported, only partial support is obtained for hypothesis 10b.

Mixed results were also obtained concerning the direct effects of the perceived costs on the two intention variables. Perceived loss of privacy had no statistically significant effects on the intentions to disclose information or the intentions to provide accurate information, regardless of the level of sensitivity. Therefore, no support could be obtained for hypotheses 11a and 11b. In contrast, perceived loss of face exerted negative and statistically significant effects on the intentions to disclose ($\beta = -0.14$, $p < 0.05$). Yet, this effect seemed to disappear when only considering non-sensitive information. Hence, only partial support is obtained for hypothesis 12a. Similarly, the effects of perceived loss of face on the intentions to provide accurate information were limited to the sensitive information, and the overall model ($\beta = -0.16$, $p < 0.05$). Hence, hypothesis 12b is also partially supported.

As described earlier, to test for hypotheses 13 and 14, we analyzed two additional models in which the eight types of information were either categorized as sensitive or non-sensitive. Two additional models were also analyzed to examine whether the results are an artifact of our modeling choices, or they hold regardless of whether the different indicators of the second-order constructs were modeled as formative or reflective indicators.

The results from these models (shown in Table 17) revealed that information type moderates the effects of perceived loss of face, perceived performance expectancy, and perceived novelty on the intentions to self-disclose. Therefore, there is sufficient support for hypothesis 13. Similarly, information sensitivity moderates the effects of perceived loss of face, perceived performance expectancy, perceived novelty, and negative emotions on the intentions to provide accurate information. Hence, hypothesis 14 is also supported in the case of these variables. Contrary to our prediction in hypothesis 14 that the effects of positive emotions on the two intentions will increase with increased information sensitivity, the results in Table 17 indicate the reverse.

Table 16. Study 2 Structural Model Results

	Negative Emotions			Positive Emotions			Intentions to Disclose						Intentions to Disclose Accurately							
	LP	LF	R ²	PE	NO	R ²	LP	LF	PE	NO	NEE	POE	R ²	LP	LF	PE	NO	NEE	POE	R ²
Reflective Model	<u>0.15</u>	<u>0.41</u>	0.29	<u>0.17</u>	<u>0.36</u>	0.22	0.02	<u>-0.14</u>	<u>0.23</u>	<u>0.18</u>	<u>-0.28</u>	<u>0.18</u>	0.47	0.04	<u>-0.16</u>	<u>0.20</u>	<u>0.09</u>	<u>-0.22</u>	<u>0.19</u>	0.33
Formative Model	<u>0.10</u>	<u>0.54</u>	0.37	<u>0.17</u>	<u>0.36</u>	0.22	-0.01	<u>-0.13</u>	<u>0.22</u>	<u>0.23</u>	<u>-0.42</u>	<u>0.09</u>	0.65	-0.01	-0.05	<u>0.19</u>	<u>0.10</u>	<u>-0.50</u>	<u>0.09</u>	0.52

LP: Perceived Loss of Privacy

LF: Perceived Loss of Face

PE: Perceived Performance Expectancy

NO: Perceived Novelty

NEE: Experienced Negative Emotions

POE: Experienced Positive Emotions

- Underlined numbers indicate significance at $p < 0.05$

Table 17. Study 2 Structural Model Results – Moderation Analysis

Reflective Indicator Model																				
	Negative Emotions			Positive Emotions			Intentions to Disclose						Intentions to Disclose Accurately							
	LP	LF	R ²	PE	NO	R ²	LP	LF	PE	NO	NEE	POE	R ²	LP	LF	PE	NO	NEE	POE	R ²
Sensitive Information	<u>0.14</u>	<u>0.49</u>	0.36	<u>0.17</u>	<u>0.36</u>	0.22	-0.01	<i>-0.17</i>	<u>0.27</u>	<u>0.21</u>	<i>-0.29</i>	<u>0.11</u>	0.56	0.01	<i>-0.14</i>	<u>0.23</u>	<u>0.09</u>	<i>-0.31</i>	<u>0.14</u>	0.42
Non-sensitive Information	<u>0.15</u>	<u>0.22</u>	0.12	<u>0.17</u>	<u>0.36</u>	0.22	0.07	-0.05	<u>0.11</u>	<u>0.09</u>	<i>-0.32</i>	<u>0.23</u>	0.28	<i>0.10</i>	<i>-0.10</i>	<u>0.12</u>	0.04	<i>-0.22</i>	<u>0.21</u>	0.19
Formative Indicator Model																				
	Negative Emotions			Positive Emotions			Intentions to Disclose						Intentions to Disclose Accurately							
	LP	LF	R ²	PE	NO	R ²	LP	LF	PE	NO	NEE	POE	R ²	LP	LF	PE	NO	NEE	POE	R ²
Sensitive Information	<u>0.11</u>	<u>0.54</u>	0.40	<u>0.17</u>	<u>0.36</u>	0.22	-0.01	<i>-0.15</i>	<u>0.25</u>	<u>0.27</u>	<i>-0.34</i>	<u>0.09</u>	0.61	0.02	-0.09	<u>0.21</u>	<u>0.15</u>	<i>-0.40</i>	<u>0.11</u>	0.47
Non-sensitive Information	<u>0.21</u>	<u>0.14</u>	0.11	<u>0.17</u>	<u>0.36</u>	0.22	-0.10	0.00	<u>0.09</u>	<u>0.19</u>	<i>-0.39</i>	<u>0.14</u>	0.37	<i>-0.11</i>	0.01	<u>0.10</u>	<u>0.17</u>	<i>-0.35</i>	0.09	0.28

LP: Perceived Loss of Privacy

LF: Perceived Loss of Face

PE: Perceived Performance Expectancy

NO: Perceived Novelty

NEE: Experienced Negative Emotions

POE: Experienced Positive Emotions

- Underlined numbers indicate significance at $p < 0.05$

- Italicized numbers indicate significance at $p < 0.10$

Table 18. Study 2 Summary of Hypotheses Support

#	Hypothesis	Level of Support
H1	Experienced negative emotions negatively influence the intentions to self-disclose.	Fully supported.
H2	Experienced negative emotions negatively influence the intentions to provide accurate self-disclosures.	Fully supported.
H3	Experienced positive emotions positively influence the intentions to self-disclose.	Fully supported.
H4	Experienced positive emotions positively influence the intentions to provide accurate self-disclosures.	Fully supported.
H5	Perceived loss of privacy positively influences experienced negative emotions.	Fully supported.
H6	Perceived loss of face positively influences experienced negative emotions.	Fully supported.
H7	Perceived novelty positively influences experienced positive emotions.	Fully supported.
H8	Perceived performance expectancy positively influences experienced positive emotions.	Fully supported.
H9	<i>a</i> Perceived performance expectancy positively influences the intentions to self-disclose.	Fully supported.
	<i>b</i> Perceived performance expectancy positively influences the intentions to provide accurate self-disclosures.	Fully supported.
H10	<i>a</i> Perceived novelty positively influences the intentions to self-disclose.	Fully supported.
	<i>b</i> Perceived novelty positively influences the intentions to provide accurate self-disclosures.	Supported in the overall and sensitive information models. No support in the non-sensitive information model.
H11	<i>a</i> Perceived loss of privacy risk negatively influences the intentions to self-disclose.	No support.
	<i>b</i> Perceived loss of privacy risk negatively influences the intentions to provide accurate self-disclosures.	No support in overall model. Partial support obtained in the case of non-sensitive information.
H12	<i>a</i> Perceived loss of face risk negatively influences the intentions to self-disclose.	Supported in the overall model, and in the case of sensitive information. No support in the case of non-sensitive information.
	<i>b</i> Perceived loss of face risk negatively influences the intentions to provide accurate self-disclosures.	Supported in the overall and sensitive information reflective models. No support in the formative models.
H13	H13: Information type moderates the effects of the determinants of the intentions to self-disclose.	General support for the moderation of the effects of loss of face, perceived performance expectancy, and novelty. The effects of positive emotions are moderated in the opposite direction.
H14	H14: Information type moderates the effects of the determinants of the intentions to provide accurate self-disclosures.	General support for the moderation of the effects of loss of face, perceived performance expectancy, novelty and negative emotions. The effects of positive emotions are moderated in the opposite direction.

3.5 Discussion of the Results, Limitations, Contributions and Concluding Remarks

3.5.1 Discussion of the Findings

This experimental study provides general support for the proposed role of positive and negative emotions in affecting the intentions to self-disclose to online virtual advisors as well as the intentions to provide accurate information. Furthermore, the study provides evidence that different types of perceived benefits and perceived costs act as determinants to evoked emotions in self-disclosure contexts.

The difference in the relative magnitudes of the effects of perceived novelty and performance expectancy on positive emotions is interesting. If anything, this difference seems to indicate that more positive emotion is evoked when experiencing information stimulation and satisfying one's curiosity, than the arousal resulting from the anticipation of the desirable outcome of healthier skin via high quality personalized advice. Yet, examining the bivariate correlations between perceived novelty and perceived performance expectancy on one hand, and the different dimensions of self-disclosure and accuracy intentions on another, reveals that both perceived benefits correlate similarly and highly with both intention variables. Hence, this seems to indicate that while the effects of perceived novelty are generally more fully mediated by the evoked positive emotions, the effects of perceived performance expectancy are less mediated. All together, the results indicate that while performance expectancy (and possibly all perceived extrinsic benefits concerning anticipated outcomes) exerts shared influence on evoked emotion and intentions, intrinsic benefits concerning outcomes that are obtainable during the interaction are better predictors of experienced emotion, which represent the quality of the experience, than subsequent behavioral intentions.

The results further revealed that perceived loss of face is consistently a more influential predictor of negative emotions and self-disclosure and accuracy intentions than loss of privacy. Obviously, these results reflect the relative importance of these antecedents within the context of this study, and other similar settings, such as those involving the self-disclosure of socially sensitive information. The bivariate correlations shown in Table 15, and the structural model results described above, both seem to confirm however, that to

better gauge the influence of perceived loss of face, one needs to separately examine its effects on the intentions to disclose different types of information. Specifically, perceived loss of face is only influential when sensitive information is solicited. Combined, these findings suggest that the effects of the two costs are largely mediated by the experienced negative emotions, with some residual direct effects of loss of face when disclosing sensitive information.

The relatively weaker effects of positive emotion when compared to negative emotion in general, and especially when soliciting sensitive information, could be attributed to a number of factors. First, positive emotion captured the general enjoyment experienced during the interaction rather than being specific to the type of information solicited. Therefore, the effect observed is not specific to the type of information solicited, and should not change significantly as the type of information changes. Second, as the sensitivity of information solicited increases, the saliency of subjective risk increases (Omarzu's, 2000). This should be expected to increase the intensity of the evoked negative emotions in anticipation of these undesired outcomes, and hence increases its saliency. Consequently, the effects of negative emotions increase. Finally, when predicting the intentions variables, positive emotions appear to mediate less of the influence of the perceived benefits than the proportion of the mediated effects of perceived costs carried by negative emotions. Hence, a smaller proportion of the effects of positive emotion come from its own determinants, reducing its overall effects.

The results of this study indicate that the determinants of the two intentions variables have similar patterns of influence on these two dependent variables, yet the magnitude of these effects are generally smaller when predicting the intentions to provide accurate information. This has resulted in differences in the percentages of variance explained for the two intentions variables. These results point out to the possibility that the determinants of accuracy intentions may differ from those of disclosure intentions. While this question remains an open one in this study, it is worthwhile to note that there is a noticeable lack of research on disclosure accuracy determinants vis-à-vis disclosure intentions.

The results concerning the moderation effects of information sensitivity are interesting and constitute a major contribution. With increased information sensitivity, the influence of perceived loss of face, perceived expectancy, perceived novelty and negative emotions also increase. This appears to be consistent with past research on self-disclosure (e.g., Omarzu, 2000) which suggests that the effects of self-disclosure determinants in general, and specifically subjective risk, increase with information sensitivity. The contradictory moderating effect of information type on the relationship between positive emotion and loss of privacy on one hand and intentions on the other is puzzling. An examination of the bivariate correlations between these two variables and the intentions for the different informational items reveal that these observed contradictory effects maybe a by-product of the reduced effects of other determinants in models of reduced information sensitivity. Both positive emotion and perceived loss of privacy have almost constant correlations with the different intentions variables. Yet, their partial effects in models where other intentions determinants do not exert strong effects are stronger, since they do not have to compete with these other determinants as fiercely.

The relatively large difference in the proportions of variances explained in the two intentions variables when soliciting sensitive and non-sensitive information is most interesting. It indicates that generally, our different views of what affects self-disclosure intentions are most appropriate when soliciting sensitive information.

3.5.2 Limitations and Future Research

Before discussing the contributions of this study, we first consider its limitations. First, similar to Study 1, the current study examines only a subset of potentially salient perceived benefits and costs. Our choice of the examined benefits and costs was motivated by the results from Study 1 as well as past research in similar contexts. The relatively modest proportions of variance explained in positive emotion and negative emotion (especially for non-sensitive information) suggest that future research should attempt to identify and examine the effects of additional benefits and costs as to better understand the determinants of these emotions.

The study was cross-sectional in nature. A longitudinal study might be necessary to fully understand how the effects of experienced emotion on disclosure intentions may change overtime, as the relationship between the virtual advisor and the customer deepens. Some may expect that the intensity of these experienced negative and positive emotions may decrease with continued usage.

Although most of the constructs in the study were captured separately for different types of information, the specialized product context may limit the generalizability of the results. As is clear from our results, most of the relationships examined are stronger when the information solicited is sensitive in nature. The need to solicit such information may not apply in other product contexts. Future research should attempt to test the proposed model in other product contexts, where even different emotions and/or benefits/costs may be salient.

Finally, the self-reported nature of the responses, and especially those concerning the intentions to provide accurate information, is another limitation of this study. This may have caused a moderate inflation in the collected responses. Yet, given that the study is experimental in nature, and subjects were randomly assigned to treatment groups, this inflation is expected to have been evenly distributed across. Since this study is concerned with relative effects rather than the absolute magnitudes of these effects, this is not a substantial concern.

3.5.3 Contribution to Research and Practice

Notwithstanding these limitations, this study makes a number of contributions to research and practice. The main contribution to IS research is an understanding of the role of emotions in influencing the intentions to provide personal information to an IT artifact in general, and specifically, a customer's intentions to self-disclose to a virtual advisor, as well as the intended accuracy of the disclosed information. In contrast to past research on customer self-disclosure, this study proposed, examined, and confirmed that emotion plays a central role in affecting self-disclosures and their accuracy. Furthermore, this study offers clear insights into how the role of emotions, independently and relative to perceived benefits and costs, changes as the sensitivity of the solicited information increases.

To the best of our knowledge, the current study is the first in IS research, and likely one of only few in social psychology and consumer research, that examines a comprehensive model of the role of emotions in self-disclosure. Confirming that one needs to not only focus on the role of rewards and costs in self-disclosure, but also on how a customer feels when self-disclosing constitutes a significant theoretical contribution that could pave the way for future research efforts.

The study also makes a number of contributions to practice. Confirming that emotions plays a significant role in reducing self-disclosure avoidance and falsification, two main problems plaguing information collection online, affirms that designers of online IT artifacts need to focus on alleviating customers' concerns during their self-disclosure experiences. While the focus of practice has been on developing clear and comprehensive privacy policy, our results seem to suggest that these efforts only have limited benefits. The relatively small effects exerted by loss of privacy compared to other determinants in this study, indicates that designers of similar advisors employed in similar contexts, need to shift their focus to improving the overall experience, and attempt to deal with all of the potential sources of negative emotion. The significant role played by positive emotions highlight the need to devise new means to heighten the enjoyment customers feel during self-disclosure contexts.

The ANOVA results, shown in Appendix C, concerning the effects of the design elements on the object-based beliefs that were confirmed to influence perceptions of benefits and costs (in Study 1), are also practically relevant. Specifically, they suggest that to enhance perceptions of rapport, a designer may employ *how* explanations and expressive speech acts. To enhance perceptions of responsiveness and expressiveness, a designer may employ both *why* and *how* explanations, as well as expressive speech acts. Finally, to enhance perceptions of transparency, a designer may employ both *how* and *why* explanations. Needless to say, the specific effects of each of these design elements may be dependent on the specific context in which the virtual advisor is deployed.

4 THE ROLE OF SOCIAL PRESENCE IN CUSTOMER SELF-DISCLOSURES TO ONLINE VIRTUAL ADVISORS

4.1 Overview

Collectively, studies 1 and 2 have examined the effects of different types of antecedents on customers' self-disclosure intentions when interacting with online virtual advisors, including the emotions customers experience during these disclosures. The third study (reported in this chapter) investigates the role of contextual factors and user characteristics. Specifically, the study examines the effects of increased social presence on the experienced negative emotions and the perceived benefits, and subsequently, the intentions to disclose to online virtual advisors. Given the established role of many individual traits in influencing self-disclosure intentions and behavior (Cozby, 1973), Study 3 also examines the effects of social anxiety on moderating the effects of embarrassment and perceived performance expectancy on self-disclosure intentions.

Study 3 builds on the findings from the two previous studies. Specifically, the results of Study 2 have revealed that during disclosure instances, customers experience a number of emotions, both negative and positive. These emotions act as determinants of self-disclosure intentions, and further, partially mediate the effects of perceived benefits and costs on these intentions. The results of study 2 further revealed that the magnitude of the effects of experienced emotions varies with the depth dimension of self-disclosure. Specifically, negative emotions were more influential when asked to disclose information about health and medical conditions (e.g., chronic health conditions), sensitive habits (e.g., sexual activity), and changes that the customer maybe experiencing (e.g., hormonal changes). As a result, in Study 3, we primarily focus on predicting the intentions to self-disclose information of higher sensitivity.

Additionally, findings from Study 2 suggest that the extent to which a customer experiences negative emotions, such as feelings of embarrassment, is a better predictor of that customer's intentions to disclose than the general enjoyment experienced during their interaction with the virtual advisor. Therefore, Study 3 focuses on negative emotions, and specifically experienced embarrassment, and further examines its antecedents.

In addition to examining the effects of experienced emotions on disclosure intentions, Study 2 included a host of other variables. This was necessary considering the study attempted to understand the factors that affect self-disclosure as well as their antecedents. Two types of benefits and costs were investigated. In general, the effects of these perceptions were found to be largely mediated by the experienced emotions, with the exception of the perceived benefit of performance expectancy. This benefit continued to exert a positive effect on self-disclosure intentions, even when experienced emotions were added to the model. Consequently, in the current study, we focus on the role of both experienced embarrassment and perceived performance expectancy as the two independent antecedents to self-disclosure intentions.

Finally, increased perceptions of the social presence of the virtual advisor, which can be achieved through the use of voice communication and animated embodiment, are hypothesized to increase perceptions of novelty and loss of face, while reducing perceptions of intrusiveness.

An online experiment was conducted to investigate the proposed relationships. Similar to studies 1 and 2, this study uses a skin care context, where customers are asked to interact with an online virtual advisor that assists them in finding a suitable skin care solution. To our knowledge, this is the first empirical study that explicitly examines the role of increased social presence on the perceived benefits and experienced embarrassment, and the consequential effects of those on self-disclosure intentions. It thus fills a void in the literature and contributes not only to a better understanding of the role of contextual factors in customer self-disclosure, but also to the concerted efforts by online vendors to improve customers' online shopping experiences.

The remainder of this chapter is organized as follows. Section 4.2 presents the research model and develops the hypotheses. The research method and results of hypothesis testing are reported in sections 4.3 and 4.4. The chapter concludes with a discussion of the results, limitations, and contributions of the study in section 4.5.

4.2 Research Model and Hypotheses

The research model is shown in Figure 7. The model highlights the proposed relationships examined in Study 3. First, the model proposes that while experienced embarrassment works to discourage the intentions to disclose information that is sensitive in nature, perceived performance expectancy enhances these intentions. Additionally, the model proposes that enhanced social presence of the virtual advisor increases the experienced embarrassment during the interaction, as well as perceptions of performance expectancy. Furthermore, the model proposes that the use of expressive speech acts on the part of the advisor, and endowing the advisor with a humanoid representation and the ability to communicate through voice enhance perceptions of its social presence. Finally, the model proposes that the characteristics of the disclosing customer, and specifically her level of social anxiety, moderate the effects of embarrassment and performance expectancy on self-disclosure intentions.

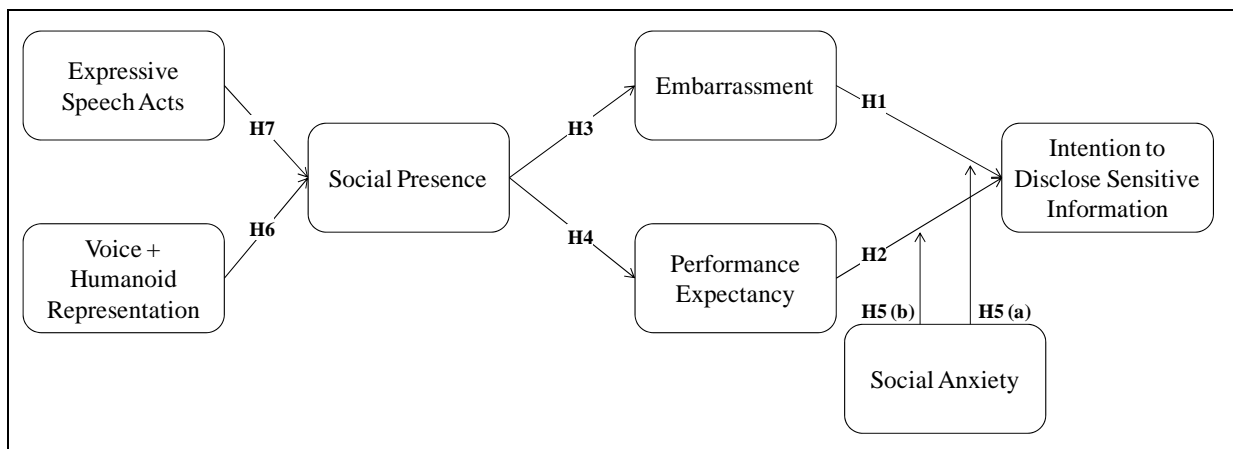


Figure 7. Study 3 Research Model

4.2.1 *The Effects of Embarrassment and Performance Expectancy on Self-disclosure Intentions*

Research on embarrassment has distinguished between two prominent models that explain its underlying causes (Miller, 1995). The first, proposes that in some situations, embarrassments comes as a result of awkward interaction, where the individual is not sure how to behave. This model, termed dramaturgic, holds that embarrassment arises when an event disrupts the

script of an encounter, leaving the individual unsure of how to proceed. For example, embarrassment arising after receiving a compliment is mainly caused by the individual's inability to decide what to do next. The second model explaining embarrassment is more general in nature. Termed the social evaluation model, it suggests that embarrassment occurs when one senses that he/she has created a negative impression in the presence of others (Edelmann, 1981; 1987; Miller, 1996). Hence, embarrassment results from failures of self-presentation, which cause an individual to believe that others are gaining undesired impressions of him or her.

As described earlier, when experiencing any negative emotions, such as embarrassment, the customer is said to be in disequilibrium (Bagozzi et al., 1999). To return to a normal state, the customer will likely use problem-focused coping to alleviate the source of these emotions, such as terminating the interaction with the virtual advisor, skipping the question, refusing to provide an answer, or providing inaccurate information. Alternatively, the customer may attempt to use emotion-focused coping by changing the interpretation of the situation, such as thinking that the questions are not embarrassing or attributing good intentions to the advisor for asking these questions (Dahl et al., 2001). Similar to our discussion in Study 2, while problem-focused coping will likely lead to self-disclosure avoidance and/or falsification, emotion-focused coping acts to neutralize the effects of negative emotions on self-disclosure. Therefore, we propose that on average, experienced embarrassment will reduce the intentions to disclose sensitive information to the virtual advisor.

H3: Experienced embarrassment negatively influences the intentions to disclose sensitive information.

This study also proposes the performance expectancy increases the customers' intentions to disclose sensitive information to an online virtual advisor. The reasoning behind this proposed relationship has been described in the two previous studies, and the effect has been confirmed.

H3: Performance expectancy positively influences the intentions to disclose sensitive information.

4.2.2 The Effects of Social Presence on Embarrassment and Performance Expectancy

Social presence is a construct that has a rich research history. In its widest form, it refers to the “perceptual illusion of nonmediation” that occurs “when a person fails to perceive or acknowledge the existence of a medium in his/her communication environment and responds as he/she would if the medium were not there.” (Lombard and Ditton, 1997).

In information systems research, social presence has been defined as the feeling of “being with another” (Biocca et al., 2003), and was traditionally used to measure the degree to which a medium allows its users to establish personal connections with other people in distant locations (Short et al., 1976). Recently, however, social presence was extended to the domain of artificial representations of humanoid intelligence, such as virtual human agents (Biocca, 1997), and even websites (Gefen and Straub, 2003). In that context, social presence refers to the extent to which an artifact is perceived as sociable, warm, personal or intimate when *interacting* with it (Gefen and Straub, 2003).

In this study, we propose that social presence will exert opposite effects on experienced embarrassment and perceived performance expectancy. In essence, we believe that increasing the virtual advisor’s social presence introduces a trade-off between the perceived benefits of the interaction and the negative emotions experienced during that interaction.

First, in light of our earlier discussion of the social evaluation model of embarrassment, it is evident that for embarrassment to occur in the context of social interactions, another individual must be present. In fact, research on embarrassment has recognized that embarrassment is essentially a social emotion that depends on the presence of real or imagined others (Edelmann, 1994). With increased social presence, the customer is more aware of the existence of the virtual advisor, and this will increase the intensity of experienced embarrassment when asked socially sensitive questions, or providing socially undesirable answers (Dahl et al., 2001).

H3: Social presence positively influences experienced embarrassment.

The effects of enhanced social presence on increasing perceptions of a virtual advisor’s usefulness have been discussed elsewhere. Given previous TAM-based studies that

successfully tested social presence as an antecedent to perceived usefulness (e.g., Karahanna and Straub, 1999), we hypothesize a direct link between social presence and perceived performance expectancy. Essentially in the context of this study, increased perceptions of the advisor's social presence indicate higher perceptions of human contact and interaction richness. This increased belief of the advisor's humanness, will likely result in increased perceptions of its expertise (Al-Natour et al., 2011) and personal focus. All of these factors subsequently will enhance the perceived value attained as a result of disclosing the solicited information.

H4: Social presence positively influences perceived performance expectancy.

4.2.3 The Role of Social Anxiety

The potential effects of the characteristics of the discloser in affecting self-disclosure intentions and their determinants have received significant research attention. While the set of characteristics that have been proposed and tested is wide-ranging, certain characteristics were shown to be more potent in specific contexts, such as gender (e.g., Snell et al., 1988), the personality traits of sensitivity to rejection and affiliative tendency (Ksionzky and Mehrabian, 1980), and the extraversion dimension of personality (Cozby, 1973). This is not to say that these characteristics will always result in higher self-disclosures or perceived benefits and costs, regardless of the context. On the contrary, researchers have warned against hypothesizing and testing for specific trait-disclosure relationships, but suggest that these should be examined in the context of specific relationships and settings (Altman and Taylor, 1973).

In this study, we focus on social anxiety. This trait is most influential in first impression contexts (initial or early encounters) and is especially important in settings involving the exchange of socially threatening information (Snell, 1989). As a trait, social anxiety is loosely defined as the tendency to experience discomfort in the presence of others (Fenigstein, Scheier, and Buss, 1975). Generally, people with high amounts of social anxiety manage it either through disaffiliation, or alternatively, through engaging in self-presentational behavior (Snell, 1989). The first amounts to minimizing social contact with others, such as avoiding initiating conversation or not participating fully in them. In the

second, socially anxious people who are concerned with impressions others are forming of them (Leary, 1983), attempt to manage these impressions by engaging in protective self-presentations (intended to avoid disapproval), or acquisitive self-presentations (intended to gain approval) (Snell, 1989).

While the potential for evoking embarrassment as a result of being asked socially sensitive questions is high, the extent to which embarrassment leads to lower self-disclosures is influenced by the characteristics of the discloser. As Miller (1995) suggests, if the social-evaluation model for explaining the causes of embarrassment is correct, the consequences of embarrassability should be more highly related to one's concern about what others are thinking. Because social anxious people are more concerned about others' impressions of them, disclosing socially embarrassing information will be minimized when the extent of embarrassment that is evoked by being asked these questions is high. Therefore, social anxiety moderates the effects of experienced embarrassment on self-disclosure intentions.

H5(a): Customer social anxiety moderates the effects of experienced embarrassment on self-disclosure intentions, where socially anxious customers will have lower intentions when they experience more embarrassment.

Another proposed effect of social anxiety is that of moderating the effects of performance expectancy on self-disclosure intentions. Because socially anxious people attempt to manage others' impressions by engaging in protective self-presentations (intended to avoid disapproval), or acquisitive self-presentations (intended to gain approval) (Snell, 1989), they would typically hesitate to self-disclose information without perceiving any benefits from doing so. This is mainly due to the fact that disclosing socially sensitive information affects their ability to present a socially-approved image and control that image. Therefore, socially anxious people are likely to disclose more when they detect that these disclosures are beneficial and necessary. Furthermore, because socially anxious people inherently pay more attention to others' opinions, especially as these opinions concern their own presented self, increased social anxiety enhances customers' initial desire to seek advice from the virtual advisor. If the disclosure requests are perceived to improve the quality of the advice, then socially anxious customers will manifest stronger desire to disclose than those with low social anxiety, as they stand to gain more from that advice.

H5(b): Customer social anxiety moderates the effects of performance expectancy on self-disclosure intentions, where socially anxious customers will have higher intentions when they perceive higher performance expectancy.

Needless to say, there are potentially many other traits that can directly affect, or moderate the effects between, the constructs examined in this study. Not least of these are the big five personality dimensions, or other more specialized characteristics. Of particular importance is customers' domain knowledge (knowledge of the product domain and experience shopping for this product), which can have significant effects on the perceived benefits, as well as the extent to which embarrassment is experienced.

4.2.4 The Role of Design Characteristics in Enhancing Social Presence

The examination of the how the design of IT artifacts can affect perceptions of social presence has a long research history. Within this stream of research, a number of studies have shown that *verbal* and *non-verbal* cues that are manifested by an IT artifact can form the basis of perceptions of the artifact's social presence. For example, Qiu and Benbasat (2005) have found that the use of text-to-speech technology and physical embodiment (3-dimensional avatars) can manifest increased social presence and enhance feelings of flow. Collectively, past studies have confirmed that the richness of the communication medium acts as the primary determinants to perceptions of social presence.

According to the media richness theory (Daft and Lengel, 1984), the richness of a medium is based upon a mix of four criteria: 1) feedback: whether the feedback is instant or not, 2) multiplicity of cues: the extent of availability of verbal and non-verbal cues, 3) personal focus: the extent to which the message is tailored to the receiver, and 4) language variety: which refers to the ability to use different types of language symbols.

In this study, we employ these criteria, and focus on two design elements that we propose can enhance perceptions of the advisor's social presence. First, we propose that the use of human voice when communicating and a humanoid representation will increase the number of cues available (criteria 2: multiplicity of cues) as well as the potential for the use of different language symbols (criteria 4: language variety), which manifests humanness and increases social presence.

Second, we propose that the use of expressive speech acts, which are used to express a certain psychological state by the speaker of the message (Janson et al., 1993), such as apologizing or expressing concern, will manifest personal focus since the advisor's responses are tailored to those of the customer (criteria 3: personal focus), as well as reaffirm the notion that feedback is instant (criteria 1: feedback).

H6: The use of voice and humanoid representation positively influences perceived social presence.

H7: The use of expressive speech acts positively influences perceived social presence.

4.3 Research Method

The study employed a 2*2 factorial design that corresponded with the following two factors: 1) expressive speech acts: whether used or not, and 2) embodiment and communication modality: whether the advisor had no physical representation and communicated via text or an animated avatar that communicated via human voice. Participants were randomly assigned (computer randomization) to one of the four experimental groups. More details about the experimental procedure, treatment conditions, sample, and measures are provided below.

4.3.1 Experimental Task

Similar to the previously described studies, subjects were invited to interact with an online virtual advisor designed to help customers in choosing skin care products. Although the main objective of this experimental task was for subjects to familiarize themselves with the virtual advisor, additional incentives were provided (entry into a random draw to win one of six \$50 vouchers redeemable at the factious store) to ensure that subjects take the task seriously.

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. These questions were identical to the ones used in Study 2 and which are shown in Table 10. The questions varied in their intimacy level, ranging from asking about demographics, to asking about sensitive habits and health conditions. After the shopping task, participants were asked to evaluate the virtual advisor,

and indicate their experienced level of embarrassment and their willingness to disclose the elicited information if using it in the future.

4.3.2 Sample

Similar to the earlier studies, this study was conducted on-line using participants recruited from an e-commerce panel maintained by an Internet market research company. 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 that is redeemable for various prizes available through the marketing firm. The sample was comprised of seventy-seven females. The characteristics of the sample are described in Table 19.

Table 19. Study 3 Sample Characteristics		
	# Participants	Percentage
Age		
19 - 24	16	20.8
25 - 34	11	14.3
35 - 44	13	16.9
45 - 54	16	20.8
55 - 64	14	18.2
65+	7	9.1
Annual Household Income		
Less than \$30,000	19	24.7
\$30,000 - \$49,999	22	28.6
\$50,000 - \$74,999	19	24.7
\$75,000 - \$99,999	11	14.3
Equal or more than \$100,000	6	7.8
Employment Status		
Employed full-time	25	32.5
Employed part-time	21	27.3
Retired	16	20.8
Unemployed	15	19.5
Educational Level		
College or graduate school degree	40	51.9
High school graduate	18	23.4
Not a high school graduate	0	0.0
Some college	19	24.7
Marital Status		
No response	1	1.3
In a relationship	12	15.6
Married	30	39
Single	32	41.6
Widowed	2	2.6

4.3.3 Treatment Conditions

Based on our earlier discussion of the proposed role of communication modality and embodiment and expressive speech acts in affecting perceptions of the advisor’s social presence, and subsequently the perceived benefits and evoked emotions, four advisors were designed that differed in whether they used expressive speech acts (first factor), and in their use of voice and three-dimensional humanoid avatar representation (second factor).

Screenshots of the four advisors used in this study are depicted in Table 21. Table 20 describes the design elements for the advisors used in each of the treatment conditions. The first treatment group used an advisor that communicated through text and had no physical representation. Advisor 2 used a human voice and was represented by a three-dimensional avatar. The third advisor communicated through text and used expressive speech acts. The fourth advisor communicated through voice, was represented by a three-dimensional avatar and used expressive speech acts.

The different levels of communication channel modality and embodiment were programmed using either Active Server Pages (ASP) for text communication, or a commercial Virtual Host service for the voice communication. In the case of voice communication, an animated avatar representing the virtual advisor read statements using a pre-recorded human voice. When the advisor communicated through text, the same statements appeared beside a still picture of the avatar. Participants receiving the voice treatment were able to refresh the last voice stream by pressing a button.

Table 20. Study 3 Treatment Advisors and Design Elements				
Factor 1		Factor 2	Human Voice - Animated Representations	
			No	Yes
Expressive Speech Acts	No		Advisor 1	Advisor 2
	Yes		Advisor 3	Advisor 4

To select an appropriate voice, we pre-tested four candidate voices. All four voices were of females between the ages of 21 and 28. During the pretest, the four voices were presented in random order to the subjects, who were asked to rate each based on its own merits (ignoring peripheral issues such as speed and accuracy of delivery). In the first stage of rating, subjects listened to two audio clips read by each voice. During this, the voices were not attached to a specific avatar representation. Thirty-three subjects rated each voice, on a 5-point agreement Likert scale, on whether it was perceived to be: 1) friendly, 2) expert, 3) passionate, 4) professional, 5) trustworthy, 6) pleasant, 7) boring, 8) aggressive, and 9) accent-Neutral (does not convey a specific regional accent). Once subjects completed their ratings of the four voices, they next listened to one more audio clip read by each of the four voices (in random order). During this second round of rating, each voice was attached to an avatar

representation (same for all four voices), and subjects were asked to rate how the voice suited the avatar.

The results from the pre-test are shown in Table 22. The results revealed that the four voices manifested different characteristics. Voice 3 was rated as the most neutral voice on most of the relevant characteristics, and was subsequently chosen as the voice that would be used in the experimental study. Our choice of the most neutral voice was motivated by the need to ensure that the voice will not manifest any additional characteristics that may confound the experimental test.

Table 21. Study 3 Screenshots of Treatment Virtual Advisors







<p style="text-align: center;">Canadian Beauty Store </p> <hr/> <p><i>Do you suffer from any of the following? Please feel free to choose more than one.</i></p> <ul style="list-style-type: none"> <input type="radio"/> Blackheads <input type="radio"/> Clogged pores <input type="radio"/> Droopy eyelids <input type="radio"/> Excessive sweating on the face <input type="radio"/> Liver spots <input type="radio"/> Pimples <input type="radio"/> Puffiness under the eyes <input type="radio"/> Skin rash <input type="radio"/> None <input type="radio"/> I'd rather not say (click this to clear your answers) <p style="text-align: center;"><input type="button" value="Next >>>"/></p> <p style="text-align: center;">Condition 1</p>	<p style="text-align: center;">Canadian Beauty Store </p> <hr/> <div style="display: flex; justify-content: space-between;"> <div style="text-align: center;">  <p><input type="button" value="▶"/> <input type="button" value="⏸"/></p> <p><i>Please make sure that you listen to every word spoken.</i></p> </div> <div> <ul style="list-style-type: none"> <input type="radio"/> Blackheads <input type="radio"/> Clogged pores <input type="radio"/> Droopy eyelids <input type="radio"/> Excessive sweating on the face <input checked="" type="radio"/> Liver spots <input type="radio"/> Pimples <input type="radio"/> Puffiness under the eyes <input type="radio"/> Skin rash <input type="radio"/> None <input type="radio"/> I'd rather not say (clicking this will also clear your answers) </div> </div> <p style="text-align: right;"><input type="button" value="Click to Repeat the Question"/> <input type="button" value="Next >>>"/></p> <p style="text-align: center;">Condition 2</p>
<p style="text-align: center;">Canadian Beauty Store </p> <hr/> <p><i>Do you suffer from any of the following? Please feel free to choose more than one.</i></p> <ul style="list-style-type: none"> <input type="radio"/> Blackheads <input type="radio"/> Clogged pores <input type="radio"/> Droopy eyelids <input type="radio"/> Excessive sweating on the face <input checked="" type="radio"/> Liver spots <input type="radio"/> Pimples <input type="radio"/> Puffiness under the eyes <input type="radio"/> Skin rash <input type="radio"/> None <input type="radio"/> I'd rather not say (clicking this will also clear your answers) <p style="background-color: #f8d7da; padding: 5px;"><i>Sorry to hear that! I understand how frustrating these things can be.</i></p> <p style="text-align: center;"><input type="button" value="Next >>>"/></p> <p style="text-align: center;">Condition 3</p>	<p style="text-align: center;">Canadian Beauty Store </p> <hr/> <div style="display: flex; justify-content: space-between;"> <div style="text-align: center;">  <p><input type="button" value="▶"/> <input type="button" value="⏸"/></p> <p><i>Please make sure that you listen to every word spoken.</i></p> </div> <div> <ul style="list-style-type: none"> <input type="radio"/> Blackheads <input type="radio"/> Clogged pores <input type="radio"/> Droopy eyelids <input type="radio"/> Excessive sweating on the face <input checked="" type="radio"/> Liver spots <input type="radio"/> Pimples <input type="radio"/> Puffiness under the eyes <input type="radio"/> Skin rash <input type="radio"/> None <input type="radio"/> I'd rather not say (clicking this will also clear your answers) </div> </div> <p style="text-align: right;"><input type="button" value="Click to Repeat the Question"/> <input type="button" value="Next >>>"/></p> <p style="text-align: center;">Condition 4</p>

Table 22. Study 3 Descriptive Statistics – Candidate Voices

		Minimum	Maximum	Mean	Std. Dev.
Friendly	Voice 1	2	5	3.73	0.80
	Voice 2	1	5	3.67	0.85
	Voice 3	2	5	3.39	0.86
	Voice 4	2	5	3.85	0.57
Expert	Voice 1	1	4	2.33	0.82
	Voice 2	1	5	2.70	0.95
	Voice 3	1	5	2.82	1.07
	Voice 4	1	5	3.61	0.83
Passionate	Voice 1	2	4	2.67	0.69
	Voice 2	2	5	2.91	0.77
	Voice 3	1	4	2.45	0.90
	Voice 4	1	5	3.55	0.90
Professional	Voice 1	1	4	2.67	0.96
	Voice 2	1	5	3.06	1.06
	Voice 3	1	5	2.94	1.12
	Voice 4	1	5	3.73	0.80
Trustworthy	Voice 1	1	5	3.06	0.79
	Voice 2	1	5	3.21	0.89
	Voice 3	2	5	3.06	0.83
	Voice 4	1	5	3.61	0.83
Pleasant	Voice 1	2	5	3.58	0.87
	Voice 2	1	5	3.76	0.94
	Voice 3	1	5	3.03	1.05
	Voice 4	2	5	3.82	0.68
Boring	Voice 1	1	5	2.97	0.88
	Voice 2	1	4	2.76	0.90
	Voice 3	1	4	2.61	1.00
	Voice 4	1	4	2.30	0.85
Aggressive	Voice 1	1	3	1.79	0.65
	Voice 2	1	4	2.00	0.90
	Voice 3	1	3	1.82	0.73
	Voice 4	1	4	2.27	0.91
Accent-Neutral	Voice 1	2	5	3.42	1.00
	Voice 2	2	5	3.52	0.94
	Voice 3	2	5	3.70	0.81
	Voice 4	1	5	3.06	1.20
Fits Face	Voice 1	1	5	2.06	1.12
	Voice 2	1	4	1.85	1.12
	Voice 3	1	5	3.21	1.22
	Voice 4	1	5	3.21	1.19

4.3.4 Measures

All constructs used in this study were measured using multi-item scales (all items are listed in Table 23). Perceived social presence was measured using the scale developed by Gefen and Straub (2003), and adapted to the context of interactions with virtual advisor by Al-

Natour et al. (2001). Embarrassment was measured using a multi-item scale indicated by the three emotions “embarrassed”, “awkward”, and “uncomfortable” consistent with the scale used in Dahl et al. (2001). Unlike study 2, these three emotions were not captured separately for each type of information solicited, but rather, subjects were instructed to focus on solicitation requests of sensitive information, and rate the extent to which these emotions were experienced. The scale measuring perceived performance expectancy was identical to the one used in studies 1 and 2. When providing their ratings on this scale, subjects were instructed to think about only the sensitive information that was solicited.

Similar to studies 1 and 2, the intentions to self-disclose were captured separately for different types of information. However, unlike the two previous studies, Study 3 focused on capturing the intentions to disclose only sensitive information. Specifically, subjects were asked about their intentions to self-disclose: 1) socially sensitive habits (e.g., smoking, sexual activity, alcohol consumption, 2) changes and experiences (e.g., changes you're going through, use of birth control pills, menstrual cycle), 3) medical history and health-related information (e.g., chronic conditions, prescription drugs, use of supplements, STDs, cosmetic procedures, electrolysis), and 4) opinions on topics (e.g., concern for the environment, animal testing).

Table 23. Study 3 Measurement Items

	S. L.	Mean	S. D.
Embarrassment (Cronbach's Alpha = 0.89): 7-point Likert Scale (Strongly disagree - Strongly agree) adapted from Dahl et al. 2001:			
1. Embarrassed.	0.90	2.68	1.65
2. Awkward.	0.91	2.75	1.74
3. Uncomfortable.	0.91	3.08	1.68
Performance Expectancy (Cronbach's Alpha = 0.96): 7-point Likert Scale (Strongly disagree - Strongly agree) adapted from Al-Natour et al. 2011:			
1. Revealing this information to the Shopping Assistant would help me get a better product(s).	0.96	5.19	1.34
2. Revealing this information to the Shopping Assistant would increase the likelihood that the recommended product(s) fits my individual needs.	0.98	5.40	1.31
3. Revealing this information to the Shopping Assistant could ensure that the recommended product(s) is personalized to my situation.	0.95	5.47	1.22
Social Presence (Cronbach's Alpha = 0.97): 7-point Likert Scale (Strongly disagree - Strongly agree) adapted from Gefen and Straub, 2003:			
1. There is a sense of human contact when interacting with the Skin Care Advisor.	0.97	4.27	1.78
2. There is a sense of personalness when interacting with the Skin Care Advisor.	0.87	4.55	1.73
3. There is a sense of sociability when interacting with the Skin Care Advisor.	0.98	4.19	1.75
4. There is a sense of human warmth when interacting with the Skin Care Advisor.	0.97	4.03	1.88
5. Interacting with the Skin Care Advisor felt like interacting with a human being.	0.94	3.79	1.99
Intention to Self-disclose (Cronbach's Alpha = 0.89): 7-point Likert Scale (Very unlikely - Very likely) adapted from Morton, 1978; Andrade et al., 2002; Spiekermann et al., 2001:			
1. Sensitive habits (smoking, sexual activity, alcohol consumption)	0.88	5.86	1.29
2. Medical history and health-related information (chronic conditions, prescription drugs, use of supplements, STDs, cosmetic procedures, electrolysis)	0.92	5.68	1.49
3. Changes and experiences (changes you're going through, use of birth control pills, menstrual cycle)	0.91	5.86	1.23
4. Opinions about certain topics (concern for the environment, animal testing)	0.72	6.18	1.07
Social Anxiety (Cronbach's Alpha = 0.78): 7-point Likert Scale (Very unlikely - Very likely) adapted from Scheier and Carver, 1985:			
1. I usually worry about making a good impression.	0.90	4.96	1.40
2. I'm concerned about what other people think of me.	0.89	4.64	1.54
3. I get embarrassed very easily.	0.70	4.19	1.56

4.4 Results

4.4.1 Measurement Model and Manipulation Checks

Factor and reliability analyses were conducted using the Statistical Package for the Social Sciences (SPSS). Construct reliability estimates (Cronbach's Alpha) and item standardized loadings are shown in Table 23. All scales showed a high level of reliability, and item loadings exceeded the recommended minimum of 0.70. The correlations between the different constructs are shown in Table 24.

Table 24. Study 3 Correlations

		SP	PE	EM	ID
1	Social Presence [SP]	-			
2	Performance Expectancy [PE]	0.55**			
3	Embarrassment [EM]	-0.45**	-0.28*		
4	Intention to Disclose [ID]	0.35**	0.48**	-0.35**	
5	Social Anxiety [SA]	0.19 ⁺	0.09	0.23	0.07

** p < 0.01
* p < 0.05
⁺ p < 0.10

4.4.2 The Effects of Design Characteristics

The mean scores and standard deviations for all construct in each treatment group are shown in Table 25. An Analysis of Variance (ANOVA) was conducted to check whether the two treatment factors (the use of expressive speech acts, and the use of voice and humanoid representation) exerted any effects on perceived social presence (results shown in Table 26)¹². The results revealed that only the use of expressive speech acts had a positive and statistically significant effect on perceived social presence ($F(1, 173) = 10.89, p < 0.01$). The use of voice and humanoid representation did not have a significant effect on increasing social presence, albeit the means were in the hypothesized direction. Therefore, while hypothesis 7 is supported, no support for hypothesis 6 could be obtained.

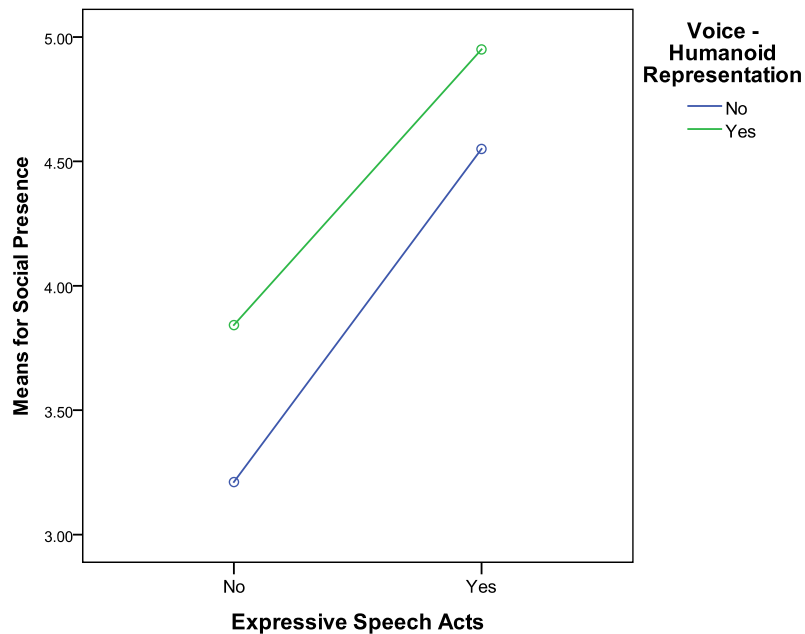
¹² The use of parametric statistics when the dependent variable is measured using an ordinal scale has been criticized at times. However, this has been the accepted practice in IS research and other related disciplines. See Carifio and Perla (2008) for a complete overview of the discussion surrounding this issue.

Table 25. Study 3 Treatment Descriptive Statistics

Construct	Treatment 1 N = 18		Treatment 2 N = 19		Treatment 3 N = 20		Treatment 4 N = 20		Total N = 77	
	Mean	STD	Mean	STD	Mean	STD	Mean	STD	Mean	STD
Social Presence	3.21	1.36	3.84	1.64	4.55	1.54	4.95	1.89	4.17	1.73
Performance Expectancy	5.15	1.43	5.39	1.02	5.25	1.17	5.62	1.35	5.36	1.24
Embarrassment	3.41	1.74	3.09	1.46	2.33	1.29	2.58	1.50	2.84	1.53
Intention to Disclose	5.75	1.33	5.55	1.27	6.09	0.82	6.15	0.93	5.89	1.10
Social Anxiety	4.44	1.37	4.61	1.31	4.52	1.05	4.80	1.33	4.60	1.25

Table 26. Study 3 ANOVA Results

	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	1316.17	1	1316.17	498.38	< 0.01
Voice-Humanoid	5.11	1	5.11	1.93	0.17
Expressive Speech Acts	28.76	1	28.76	10.89	< 0.01
Expressives * Voice-Humanoid	0.26	1	0.26	0.10	0.76
Error	192.78	73	2.64		
Total	1562.96	77			



4.4.3 Structural Model Results

To test hypotheses 1-5, we analyzed a structural model using Partial Least Squares (PLS) with SmartPLS 2.0 (Ringle, Wende, & Will, 2005). The model included social anxiety as a moderator variable, moderating the effects of embarrassment and performance expectancy on self-disclosure intentions. To accomplish this, two interaction effects (embarrassment * social anxiety, performance expectancy * social anxiety) were added as additional predictors of self-disclosure intentions. The results from the model are shown in Figure 8. Standard errors were computed using a bootstrap procedure with 500 resamples.

The results from the structural model revealed that embarrassment has a negative effect on the intentions to disclose sensitive information ($\beta = -0.24$, $p < 0.01$). Hence, hypothesis 1 is supported. Consistent with the results of the two previous studies, and with our prediction in hypothesis 2, perceived performance expectancy had a positive effect on the intentions to disclose ($\beta = 0.41$, $p < 0.01$). Combined, embarrassment and performance expectancy explained 30% of the variance in the intentions to self-disclose.

The results further reveal that social presence plays an important role in affecting perceptions of performance expectancy and experienced embarrassment. Consistent with hypothesis 4, social presence had a positive effect on performance expectancy ($\beta = 0.56$, $p < 0.01$). However, in clear contrast to our prediction in hypothesis 3 stating that social presence will increase the experienced embarrassment, the results revealed that social presence has a large *negative* and statistically significant effect on embarrassment ($\beta = -0.45$, $p < 0.01$).

Consistent with our predictions in hypotheses 5a and 5b, the results revealed that the customer's level of social anxiety moderates the effects of both experienced embarrassment and performance expectancy on self-disclosure intentions. They confirm that more socially anxious customers have lower intentions to disclose if they experience embarrassment compared to their less socially anxious counterparts ($\beta = -0.13$, $p < 0.01$). Alternatively, more socially anxious customers have higher intentions to disclose if they perceive higher performance expectancy when compared to less socially anxious ones ($\beta = 0.15$, $p < 0.01$).

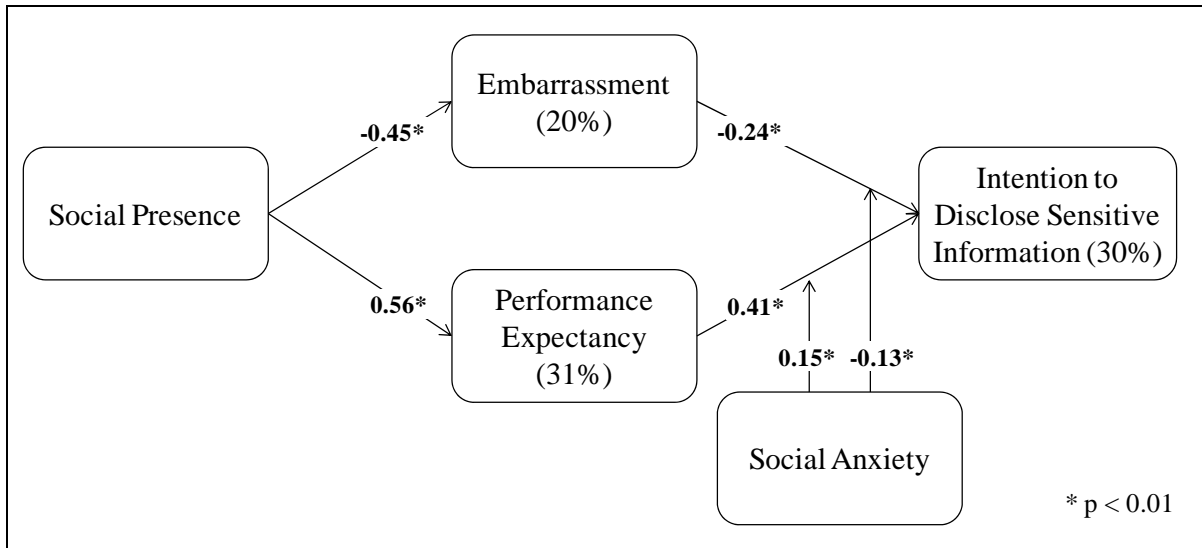


Figure 8. Study 3 Structural Model Results

4.5 Discussion of the Results, Limitations, Contributions and Concluding Remarks

4.5.1 Discussion of the Findings

The experimental study described in this chapter provides general support for the proposed role of contextual factors in affecting the intentions to self-disclose to online virtual advisors, via influencing the antecedents of these intentions. Furthermore, the study provides evidence that different customer characteristics, and specifically social anxiety, can act to moderate the effects of experienced emotions (embarrassment) and perceived benefits (performance expectancy) on self-disclosure intentions.

The difference in the relative magnitudes of the effects of perceived performance expectancy and experienced embarrassment is interesting. While both had significant effects on customers' intentions to disclose sensitive information, the effects of performance expectancy largely exceeded those of embarrassment. This could be attributed to the utilitarian nature of the task, where the perceived benefits were more salient in the minds of customers. Alternatively, the reduced effects of embarrassment could have been caused by the specialized nature of the task and the self-selection of the participants, where subjects elected to seek the advisor's expert advice. All together, the results seem to indicate that although experienced embarrassment, which represent the quality of the experience, is a

significant predictor of the intentions to disclose sensitive information, the decision to disclose remains to be largely a calculus-based one.

The finding concerning the negative effect of social presence on experienced embarrassment is interesting and constitutes a major contribution. Contrary to our predictions, social presence exerted a negative and relatively large effect on experienced embarrassment. This could be attributed to the nature of the scale used to measure social presence. In this study, social presence was conceptualized to refer to the extent to which the advisor is perceived as sociable, warm, personal or intimate (Gefen and Straub, 2003). Therefore, with increased social presence, comes increased perceptions of personal care and focus (especially in light of the ANOVA results showing that social presence in this study was enhanced via the use of expressive speech acts), which can reasonably be expected to reduce the level of embarrassment experienced when being asked to disclose, or when disclosing, socially sensitive information.

An alternative, yet consistent explanation of this finding is that with increased media richness (and thus, social presence), it is easier for the customer to build a personal connection with the virtual advisor, and even enhance their liking of that advisor. This, as suggested by Xu, Cenfetelli and Aquino (2012), could lead to an increase in positivity biases (where people routinely presume others are truthful), as well as distract from the task and increase attention to process-oriented issues, such as building a personal connection with the advisor. This enhanced connectivity can then act as a buffer against reactions to any perceived transgressions, such as soliciting embarrassing information. In so doing, increased media richness facilitates emotional-coping to the experienced negative emotion of embarrassment.

The statistical insignificance of the effect of the use of voice and humanoid representation on perceptions of social presence could be attributed to the small sample size. The observed effect was in the predicted direction, and past research has previously confirmed this effect (e.g., Qiu and Benbasat, 2005).

4.5.2 Limitations and Future Research

Before discussing the contributions of this study, we first consider its limitations. First, similar to the two previous studies, the current study examines only one of the potentially

salient perceived benefits and experienced emotions. Our choice of the examined benefit and experienced emotions was motivated by the results from studies 1 and 3, as well as past research in similar contexts. Furthermore, this study focused only on the role of social presence in affecting perceptions of performance expectancy and evoking embarrassment. The collective findings from the two previous studies indicate that other antecedents to these constructs exist; which may help clarify the relatively modest proportions of variance explained in these two constructs.

Similar to previously described studies, this study was cross-sectional in nature. A longitudinal study might be necessary to fully understand how experienced embarrassment may change overtime, as the relationship between the virtual advisor and the customer deepens, and how the perceived benefits may erode as the customer gains personal expertise in skin care.

Although the focus of this study was on self-disclosure of sensitive information, the specialized product context may limit the generalizability of the results. As is clear from the results obtained in Study 2, the effects of experienced emotions and even perceived benefits are stronger when the information solicited is sensitive in nature. The need to solicit sensitive information that could evoke embarrassment may not apply in other product contexts. Future research should attempt to develop alternative models that are appropriate to other product contexts, where even different emotions and/or benefits/costs may be salient.

4.5.3 Contribution to Research and Practice

Notwithstanding these limitations, this study makes a number of contributions to research and practice. The main contribution to IS research is an understanding the role of contextual factors in online self-disclosure contexts. To the best of our knowledge, the current study is the first in IS research, and likely one of only few in social psychology and consumer research, that examines the role of increased social presence in affecting experienced embarrassment. Confirming that one needs to not only focus on the role of rewards and costs in self-disclosure, but also on how a customer feels when self-disclosing constitutes a significant theoretical contribution that could pave the way for future research efforts.

The study also makes a number of contributions to practice. Confirming that the design of a virtual advisor could be used to manifest social presence, and consequently affect self-disclosure antecedents, affirms that designers of online IT artifacts need to focus on designing better shopping experiences. The ability of expressive speech acts to manifest social presence on the part of the virtual advisor underscores the need to focus on the dynamics of the interaction with the virtual advisor and making it resemble interpersonal ones.

5 DISCUSSION AND CONCLUSION

5.1 Summary of the Thesis

Business-to-consumer e-commerce has experienced unparalleled growth since its inception a decade and a half ago. Yet, customers' concerns about providing personal information to online vendors, and their discomfort when having to do so, continue to be the chief obstacles to further growth over the same period of time. Hence, the research described in this dissertation was motivated by a simple question: What are the factors that encourage or inhibit customers to self-disclose personal information to online IT artifacts? To answer this basic question, we conducted an exhaustive literature review of self-disclosure, and developed and tested a number of theoretical models of its determinants.

While research into the antecedents and consequences of self-disclosure in consumer contexts has experienced a significant growth in recent years, past studies have been narrow in their focus. In the introduction of this thesis, we have identified a number of gaps in regards to the sole focus on rewards and costs as antecedents to self-disclosure, the focus on descriptive disclosures and those concerning financial information, and the unidimensional treatment of the self-disclosure construct. To fill-in these gaps, this thesis developed and tested a number of theoretical models that identify and propose distinct roles for an extended set of self-disclosure antecedents, while considering this construct's different dimensions and facets. Specifically, this thesis answered a number of research questions and addressed a number of themes that were stated in Chapter 1:

5.1.1 Different Views of Self-disclosure and its Determinants

Collectively, the studies described in this thesis present a broad view of the different types of antecedents that affect customers' willingness to self-disclosure to online virtual advisors. To identify these determinants, we adopted a broader view of self-disclosure. In addition to viewing self-disclosure as a social exchange influenced by rewards and costs, this research accounted for the views of self-disclosure as an interpersonal and relational process. Consistent with this, the research identifies and highlights the important role played by

salient relational variables, contextual cues, as well as the characteristics of both the target and the source of disclosures.

Overall, the studies described were successful in delineating the distinct effects of the different determinants of self-disclosure, underscoring the need for a broader and more encompassing approach to the study of self-disclosure antecedents. Specifically, the studies described in this thesis highlight the important role of relationship variables (Study 1), characteristics of the virtual advisor (Study 1), different types of perceived benefits and costs (Study 1 and 2), and the important role of emotion in mediating the effects of the latter and exerting its unique influences (Study 2).

Of equal importance is our examination of the role of the design of virtual advisors in manifesting the desired characteristics, which was described in Study 1. The results highlight the distinct and varying roles that different design characteristics play in cueing desired characteristics that encourage self-disclosures.

5.1.2 Self-disclosure as a Multi-dimensional and a Multi-faceted Construct

Unlike most of the past studies on self-disclosure in consumer contexts, the research described in this thesis adopted a broader approach to conceptualizing self-disclosure. In this research, we examined the relationship between the two distinct dimensions of self-disclosure, namely depth and breadth, and highlighted the complexities surrounding their relationship. Based on the well-established categorization of the different types of self-disclosure proposed by Morton's (1978), and past research in consumer contexts (e.g., Andrade et al., 2002; Spiekermann et al., 2001), in Study 1 we were able to identify several types of information that are likely to be solicited online. To facilitate our increased focus on sensitive information in subsequent studies, we identified additional sub-categories. Overall, this categorization allowed us to examine the determinants of self-disclosure for each type of information separately. This proved to be an important step, since the results clearly showed that information type plays a significant moderating role.

On the other hand, the research also looked at two different facets of self-disclosure, namely self-disclosure intentions and honesty intentions. The importance of considering these two distinct facets of self-disclosure has been recognized in e-commerce research (Son and Kim,

2008). From an e-vendor's perspective, falsification of self-disclosures might be a more serious problem than self-disclosure refusal, as it introduces errors and inconsistencies. Therefore, there is the need to understand not only what encourages a customer to self-disclose, but also what encourages her to provide accurate information. Our examination highlighted that both intentions are driven by similar antecedents, and these determinants have similar patterns of influence when comparing sensitive and non-sensitive information. However, the smaller proportion of variance explained in accuracy intentions points out to the need to further investigate any unique antecedents that it may possess.

5.1.3 The Role of Self-disclosure Experience and Contextual Factors

Guided by industry reports that highlight the general discomfort many feel when providing personal information, and the extensive body of research in social psychology that views self-disclosure as an interpersonal process, this research investigated how the customer's *experience* when self-disclosing can affect her subsequent self-disclosure intentions (addressed in the studies reported in Chapters 3 and 4). One major aspect of the "experience" that was investigated is that of evoked emotion during self-disclosure episodes. The results of our investigation indicated that both negative and positive emotion can be evoked as a result of what transpires during the interaction (e.g., increased information stimulation), or anticipated positive and negative outcomes (e.g., high quality personalized advice). These evoked emotions subsequently, affect customers' self-disclosure and accuracy intentions, and for the most part also mediate the effects of the perceived benefits and costs.

Another aspect of the "experience" that was investigated concerned contextual factors that change the characteristics of the interaction (addressed in the study reported in Chapter 4). Our findings indicate that these could act to encourage or inhibit self-disclosures via enhancing perceptions of the advisor's social presence and humanness.

5.2 Contributions

5.2.1 Theoretical Contributions

The studies described in this dissertation offer a number of significant theoretical insights in regards to self-disclosure phenomena in online contexts. First and foremost, this research

offers a comprehensive view of the different factors that affect self-disclosure. While past research has focused on the role of rewards and costs in explaining self-disclosure decisions, our research highlights that rewards and costs offer only a partial view, and that relational, contextual, emotional, and personal characteristics play an additional and important role. In part, the findings of this research lend further support to the view of interactions with IT artifacts as social and interpersonal, and confirm the importance of social and relational factors in such contexts, especially as they concern self-disclosure. At a more macro level, this research confirms that self-disclosure, even when one of the entities is an IT artifact, is viewed as an interpersonal process situated in an interpersonal interaction.

Second, findings in regards to the role of emotions in exerting direct effects, and mediating the effects of other determinants, are very significant. At minimum, these findings underscore that this element that has been often ignored in past research need to be considered when thinking about self-disclosure in consumer contexts, especially in regards to sensitive information.

Third, this thesis also offers additional insights vis-à-vis the role of information sensitivity. While past research in consumer contexts in general, and e-commerce in specific, has focused on disclosure of financial and descriptive information, this research took a broader approach. With increased sophistication and the endowment of autonomous decision making, many IT artifacts are now being employed in contexts that were unthought-of of several years ago. In today's technology-driven business processes, IT artifacts are fast replacing expert human decision-makers in domains that require the solicitation of highly sensitive information, such as health care and insurance. Findings from this research underscore that the old "rules" may not apply, and that the context may largely determine the factors of importance.

Finally, findings in regards to the role of contextual factors and individualistic and dyadic object-based beliefs draw attention to the important role of the customers' experience when using online IT artifacts. Integrating our findings with the large body of prior research investigating how to improve users' interaction with IT artifacts, reaffirms the view of IT

artifacts as social actors, to whom self-disclosures are no different than those made to human counterparts.

5.2.2 Practical Contributions

The research described in this thesis makes a number of practical contributions. First, a major component of Study 1 concerned the examination of how the design of virtual advisors can be used to manifest desired characteristics that induce self-disclosure. In so doing, this research offers online IT artifact designers clear guidelines as to how these artifacts can be designed.

Second, findings in regards to the multiplicity of determinants that affect customer self-disclosure suggest that e-vendors' current practices to induce self-disclosures are insufficient. While the focus of practice has been on developing clear and comprehensive privacy policy, this research suggests that these efforts will result in small improvements. The relatively small effects exerted by loss of privacy compared to other determinants indicate that designers need to shift their focus to other factors, such as improving the overall interaction experience and considering relational factors.

Third, confirming that emotion plays a significant role in reducing self-disclosure avoidance and falsification is very informative to practice. This supports recent proposals that online shopping is in essence a social experience. Hence, only focusing on the utilitarian aspects of this experience is lacking. Potentially, there are many ways in which designers of online IT artifacts can improve customers' experiences via evoking positive emotion and lessen the intensity of experienced negative emotion. Research in marketing on visualization and priming offers a promising avenue. These techniques could be used to evoke positive anticipatory emotions. Our research findings concerning the significant role of perceived novelty in evoking positive emotion underscore the need for e-vendors to stimulate the curiosity of their customers. The significant influence of the perceived costs of self-disclosure on evoking negative emotions, reiterates the need for strict privacy policies that make clear commitments to protect collected information from mishandling.

Finally, findings in regards to the role of contextual factors and individualistic and dyadic object-based beliefs draw attention to the important role of designing enjoyable and

unstressful interactions. Our findings, combined with past research on improving interaction with IT artifacts, offer a number of pointers as to how this could be achieved.

5.3 Limitations and Future Research

The research described in this dissertation has a number of limitations. First and foremost, all the studies described in this thesis used a skin care context. Our choice of this context was motivated by a number of factors. First, beauty and health constitutes the fastest growing product category in online retail (Sillitoe, 2011). Second, purchase decisions for these products are inherently complex, given the multiplicity and specialized nature of their attributes and the need for personalized advice. Therefore, the use of intelligent virtual advisors both as a tutor and a recommender system is most appropriate. Finally, as a consequence of product complexity and necessary personalization, the need to solicit information of varying levels of intimacy arises. This allows for the examination of the moderating role of information type.

All of the experiments described in this thesis have been conducted in the field, using samples drawn from the general e-commerce population. While this may reduce our ability to control for other factors (e.g., time it takes to complete the task), it strengthens the results' external validity. A recurring limitation to all of the studies described, however, was the nature of the sample used. To conduct our experiments, we used samples drawn from members of a marketing panel company. This creates the potential for self-selection bias as these members have previously agreed to participate in data collection efforts and provide information. It is reasonable to suggest that this skewed nature of the sample likely affected the mean scores of some of the measured variables, and potentially reduced the amount of variance in the measured constructs. Therefore, our results should be seen as more conservative, and one should expect that the confirmed relationships between the different constructs are stronger in reality than what our data shows.

Future research efforts could proceed in a number of directions. First, we highlight the need for a longitudinal examination of the relationships tested in this dissertation. Many of the perceived costs and evoked negative emotions are likely to be alleviated as the relationship with the e-vendor deepens, and where past experiences can help mitigate customer concerns.

Yet, past research in social psychology and marketing also seems to suggest that other factors may become more important as the relationship with the e-vendor deepens. As we highlighted in our discussion of Study 1, we expect that the effects of the relationship beliefs on self-disclosure intentions will increase as the relationship matures.

While our research confirms that we can explain a large proportion of the differences in self-disclosure intentions, little might apply when trying to predict self-disclosure behavior. The existence of a privacy paradox, which concerns the difference between customers' stated intentions to disclose personal information and their actual disclosing behavior, is well established (Norberg et al., 2007). Investigating whether the identified antecedents do in fact predict self-disclosure behavior henceforth is most necessary.

Cultural influences on self-disclosure tendencies are also well established (Cozby, 1973). Accordingly, the results from this research may not hold beyond western-oriented cultures. Future research efforts should consider replicating the studies described herein in other cultural contexts, to better understand the role culture plays in affecting the determinants of online disclosures.

Another avenue for future research is investigating how the proposed relationships hold in offline contexts, or more interestingly, in hybrid contexts where customers interact with online IT artifacts in public domains. Past research in marketing seems to suggest that the intensity of the experienced emotions will increase as a result of increased social presence (Dahl et al., 2001).

Finally, the results from the second study highlight the need to further investigate whether the determinants of the different facets of the self-disclosure construct are the same. The lower proportion of variances explained in the accuracy intentions raises the possibility that different facets of self-disclosure have different determinants.

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APPENDIX A

A.1 Pilot 1

A partial test of the proposed model was performed in the first pilot study. Forty-seven subjects, recruited from an online marketing panel were randomly assigned to use one of four available virtual advisors. The sample included both male and female subjects.

A.1.1 Experimental Task

Subjects were invited to experiment with one of four online virtual advisors (described below), tasked with helping them choose a suitable skin care product. The main objective of the experimental task was for subjects to familiarize themselves with the available virtual advisor. Therefore, subjects were instructed to complete the shopping task as if they were shopping for a friend. During the task, the virtual advisor asked the subjects a series of multiple choice questions to help determine their skin care needs so it can recommend a personalized product. These questions varied in their intimacy levels (and comprised a subset of those used in the main study), ranging from questions about demographics, to questions about health conditions. After the main task, subjects were asked to evaluate the virtual advisor and indicate their willingness to disclose the elicited information if they were to use the virtual advisor to shop for themselves.

A.1.2 Treatment Conditions

To create adequate levels of variance in the exogenous variables, four virtual advisors were designed. The advisors differed in: 1) whether they offered an explanation as to why a certain question is being asked (termed “why” explanations, Wang and Benbasat, 2007), 2) whether they offered a description of how the information elicited will be used (termed “how” explanations, Wang and Benbasat, 2007), 3) the use of extrovert as opposed to introvert phrasing of sentences (similar to Hess et al., 2006), 4) the use of expressive speech acts, used to express personal feelings (Searle, 1979), and finally, 5) the use of commissive speech acts, which are used to make promises and commitments (Searle, 1979).

Specifically, 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.
- **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.

A.1.3 Measures

In this pilot study, we measured a number of constructs, all of which were measured using multi-item scales. Six new scales were developed to measure the three sub-dimensions of responsiveness and those of rapport, consistent with their definitions discussed earlier. Also, overall responsiveness and overall rapport were each measured using two multi-item scales. We also measured loss of privacy and loss of face, adapting their scales from White (2004). Performance expectancy was measured using a newly developed scale that was anchored in general definitions of performance expectancy in the context of information systems use (Venkatesh et al., 2003). Overall trust and the three beliefs of competence, benevolence, and integrity were captured using scales adapted from McKnight et al. (2002).

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 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), 4) personal feelings, opinions and judgments about sensitive topics (e.g., sexual orientation).

A.1.4 Results

Factor and reliability analyses were conducted using the Statistical Package for the Social Sciences (SPSS). All scales showed a high level of reliability and item loadings exceeded the recommended minimum of 0.70 with the exception of the second item of overall trust, and the last item of the validation sub-dimension of responsiveness. This latter item was a reverse-coded item, and was dropped from the scale as this was not thought to threaten the scale's content validity.

Table 27 depicts the correlations between the different latent variables, while Table 28 shows their means and standard deviations in each treatment group.

The results in Table 28 revealed that the design of the virtual advisor can be used to manifest desired characteristics. Advisors 3 and 4, which used extrovert text, and responded to subject's answers with expressive and commissive speech acts and how explanations were seen to be more responsive and to be higher in rapport. These characteristics were observed to correlate very highly with overall trust and the three trusting beliefs. This is not surprising considering that the treatments conditions that were used to manifest responsiveness were also used to manifest rapport. Additionally, these two constructs enjoy a much higher correlation with performance expectancy than with the three types of perceived costs used in this study. While not intended, Advisor 3, which was mainly designed as a social advisor (high in responsiveness and rapport) effected the highest performance expectancy scores. It appears that the use of customized how explanations and commissive speech acts induced higher perceptions of performance expectancy than when using generalized how and why explanations as was done in Advisors 2 and 4. Overall, Advisor 1, which served as the control condition, exhibited less favorable characteristics. Advisor 2, which was low in responsiveness and rapport, was still able to affect perceptions of benefits and costs through its use of generalized (not customized based on subjects' answers) *why* and *how* explanations, and commissive speech acts.

To get an indication as to the validity of some of the proposed relationships in Figure 3, we analyzed a structural model using Partial Least Squares (PLS) with SmartPLS 2.0 (Ringle, Wende, & Will, 2005). In this model, perceived disclosure costs, trust, perceived

responsiveness, and perceived rapport were treated as second-order constructs that were reflected by the factor scores of their respective 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-construct were all statistically significant.

The results of the structural model analysis are provided in Table 29. As should be expected, the high correlations between the sub-dimensions of responsiveness and rapport and the three trusting beliefs appear to be causing a number of problems. Most obvious of those is the relatively high negative effect of trust on the willingness to disclose non-sensitive information. This is surprising given the positive correlations between overall trust and the three trusting beliefs on one hand, and both intentions to disclose constructs. The results also indicate that responsiveness and rapport, probably due to their high shared variance, are suppressing each other's effects.

Table 27. Pilot 1 Correlations

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1 Positivity	1.00															
2 Attentiveness	0.86	1.00														
3 Coordination	0.71	0.72	1.00													
4 Overall Rapport	0.77	0.73	0.70	1.00												
5 Understanding	0.83	0.81	0.77	0.77	1.00											
6 Validating	0.78	0.73	0.79	0.69	0.84	1.00										
7 Caring	0.82	0.78	0.75	0.81	0.86	0.86	1.00									
8 Overall Responsiveness	0.67	0.72	0.72	0.68	0.71	0.73	0.76	1.00								
9 Loss of Privacy	-0.01	-0.01	-0.02	-0.06	-0.17	-0.11	-0.06	0.05	1.00							
10 Loss of Face	-0.18	-0.16	-0.07	-0.12	-0.15	-0.16	-0.14	-0.04	0.74	1.00						
11 Performance Expectancy	0.58	0.53	0.65	0.54	0.67	0.63	0.64	0.49	0.02	0.03	1.00					
12 Overall Trust	0.71	0.71	0.66	0.68	0.72	0.75	0.70	0.57	-0.24	-0.23	0.42	1.00				
13 Benevolence	0.80	0.76	0.69	0.75	0.78	0.67	0.76	0.60	-0.07	-0.06	0.59	0.68	1.00			
14 Integrity	0.73	0.81	0.75	0.68	0.77	0.71	0.73	0.67	-0.12	-0.07	0.48	0.78	0.82	1.00		
15 Competence	0.73	0.71	0.73	0.68	0.87	0.67	0.71	0.56	-0.06	0.00	0.66	0.62	0.84	0.75	1.00	
16 Willingness to Disclose – Not Sensitive	<i>0.24</i>	0.30	0.38	0.22	0.36	0.36	0.20	0.20	-0.06	0.03	0.44	0.19	0.17	<i>0.25</i>	0.31	1.00
17 Willingness to Disclose - Sensitive	0.29	0.36	0.44	<i>0.28</i>	0.45	0.46	0.36	<i>0.28</i>	-0.30	-0.23	0.37	0.34	0.21	0.40	0.29	0.76
Bolding indicates significance at $p < 0.05$. Italicizing indicates significance at $p < 0.1$.																

Table 28. Pilot 1 Descriptive Statistics

Construct	Treatment Group												Total		
	1			2			3			4					
	N	Mean	S. Dev.	N	Mean	S. Dev.	N	Mean	S. Dev.	N	Mean	S. Dev.	N	Mean	S. Dev.
Positivity	11	4.61	1.08	10	4.80	1.20	13	5.69	0.87	13	5.69	1.19	47	5.25	1.16
Attentiveness	11	4.79	1.28	10	5.00	0.79	13	5.77	1.03	13	5.64	1.36	47	5.34	1.19
Coordination	11	4.94	0.85	10	4.77	1.10	13	5.49	0.78	13	5.28	1.04	47	5.15	0.96
Overall Rapport	11	4.55	1.17	10	4.00	1.18	13	4.77	0.88	13	4.88	1.54	47	4.59	1.23
Understanding	11	4.33	1.28	10	4.24	1.45	13	5.32	1.21	13	5.34	1.44	47	4.86	1.40
Validating	11	4.79	1.38	10	4.40	1.26	13	5.62	0.92	13	5.33	1.51	47	5.09	1.33
Caring	11	4.33	1.35	10	4.23	1.05	13	5.56	0.93	13	5.10	1.36	47	4.87	1.28
Overall Responsiveness	11	4.64	1.38	10	4.35	0.75	13	5.31	1.05	13	5.04	1.44	47	4.87	1.22
Loss of Privacy	11	4.59	1.36	10	4.15	1.42	13	4.12	2.02	13	3.58	1.17	47	4.09	1.53
Loss of Face	11	4.09	0.89	10	3.20	1.14	13	3.54	1.66	13	2.65	1.26	47	3.35	1.36
Performance Expectancy	11	5.02	1.49	10	5.20	1.65	13	6.02	1.37	13	5.17	1.31	47	5.38	1.46
Overall Trust	11	5.03	1.16	10	4.90	1.46	13	5.54	0.80	13	5.49	1.29	47	5.27	1.18
Benevolence	11	4.91	1.06	10	4.78	1.08	13	5.54	1.02	13	5.63	1.19	47	5.26	1.12
Integrity	11	5.09	1.13	10	4.70	1.63	13	5.56	1.17	13	5.69	1.30	47	5.30	1.32
Competence	11	4.82	0.84	10	4.70	0.75	13	5.15	1.26	13	5.58	1.02	47	5.10	1.04
Willingness to Disclose – Not sensitive	11	6.09	0.88	10	5.87	1.00	13	6.26	0.78	13	5.90	0.75	47	6.04	0.84
Willingness to Disclose - Sensitive	11	4.95	1.59	10	4.75	1.84	13	5.62	1.45	13	5.42	1.22	47	5.22	1.51

Table 29. Pilot 1 Structural Model Results			
	Beta	Standard Error	T-Statistics
Disclosure Costs → Willingness to Disclose - Not Sensitive	-0.29	0.07	4.24
Performance Expectancy → Willingness to Disclose - Not Sensitive	0.31	0.08	3.96
Rapport → Willingness to Disclose - Not Sensitive	0.16	0.14	1.11
Responsiveness → Willingness to Disclose - Not Sensitive	0.35	0.17	2.03
Trust → Willingness to Disclose - Not Sensitive	-0.45	0.14	3.35
Disclosure Costs → Willingness to Disclose - Sensitive	-0.31	0.06	5.00
Performance Expectancy → Willingness to Disclose - Sensitive	0.23	0.07	3.39
Rapport → Willingness to Disclose - Sensitive	0.14	0.15	0.94
Responsiveness → Willingness to Disclose - Sensitive	0.22	0.15	1.45
Trust → Willingness to Disclose - Sensitive	-0.15	0.12	1.29
Rapport → Disclosure Costs	0.23	0.15	1.56
Rapport → Performance Expectancy	0.15	0.08	1.90
Rapport → Trust	0.61	0.08	7.24
Responsiveness → Disclosure Costs	-0.44	0.17	2.57
Responsiveness → Performance Expectancy	0.54	0.09	6.12
Responsiveness → Trust	0.30	0.09	3.41

A.2 Pilot 2

There were a number of differences between pilots 1 and 2. These are summarized below:

- **Variables measured:** In addition to the variables captured in the first pilot study, in pilot 2, we developed and used a measure for the three dimensions of interdependence. Furthermore, pilot 2 measured one additional type of benefits that is intrinsic in nature, namely, social adjustment.
- **Modified scales:** based on the results from pilot 1, a number of measurement scales were modified. The most significant changes were those made to the intentions to disclose scale. Rather than the four categories of information captured in pilot 1, we used eight categories: 1) Demographical information (e.g., gender, age, ethnicity), 2) Information general habits (e.g., exercise and travel habits), 3) Information about sensitive habits (e.g., sexual activity, smoking), 4) Information about skin care needs (e.g., skin type, areas to concentrate on), 5) Information about product preferences (e.g., smells), 6)

Information about health (e.g., medical information, health conditions), 7) Feelings, opinions and judgments about non-sensitive topics (e.g., concern for the environment, animal testing), and 8) Feelings, opinions and judgments about sensitive topics (e.g., preference for natural remedies). These were believed to cluster into three main categories: general information, product-related information, and sensitive information. Understandably, the script used by the advisor was modified based on feedback from pilot 1, and new questions were added. Table 30 lists all the questions used.

Table 30. Pilot 2 Virtual Advisor Questions			
Question	Options	Type	Focus
What you would like to accomplish at this stage?	<ul style="list-style-type: none"> • Visible improvement in my skin • Help my skin be the best it can be • Keep up with the most advanced skin care products 	Product and Skin Care Needs	Skin-related
Are there any changes that are going on in your life?	<ul style="list-style-type: none"> • Hormonal changes • Weight changes • Health changes • Not enough "me" time • None 	Health	General
What is your age?	<ul style="list-style-type: none"> • Teens • 20's • 30's • 40's • 50's • 60's • 70's • 80's and over 	Demographics	General
What is your gender?	<ul style="list-style-type: none"> • Male • Female 	Demographics	General
What is your ethnicity?	<ul style="list-style-type: none"> • Asian/Pacific Islander • Black • Caucasian • Hispanic 	Demographics	General
What is your skin type?	<ul style="list-style-type: none"> • Normal • Sensitive 	Product and Skin Care Needs & Habits	Skin-related
How would you describe your skin?	<ul style="list-style-type: none"> • Oily • Dry • Oily in some parts and dry in others 	Product and Skin Care Needs & Habits	Skin-related
How often do you wash your face?	<ul style="list-style-type: none"> • Very often • Rarely • Often 	General Habits	Skin-related

Table 30. Pilot 2 Virtual Advisor Questions (continued)

Question	Options	Type	Focus
What do you use to wash your face?	<ul style="list-style-type: none"> • Hands • Washcloth 	General Habits	Skin-related
What area of skin care would you like to focus on?	<ul style="list-style-type: none"> • Skin discoloration • Lines or wrinkles • Acne • Dryness • General care 	Product and Skin Care Needs & Habits	Skin-related
What's your favorite smell?	<ul style="list-style-type: none"> • Flowery smells • Fresh fruits • Coconuts • Natural smells • No preference 	Product/General Preferences	General
Do you suffer from an allergy?	<ul style="list-style-type: none"> • Food allergies (e.g., nuts) • Seasonal allergies • Environmental allergies • Other types of allergies • None 	Health	General
How often do you travel?	<ul style="list-style-type: none"> • Never • 1-2 times a year • 2-5 times a year • More than 5 times a year 	General Habits	General
Do you exercise?	<ul style="list-style-type: none"> • Never • Rarely (1-2 times a week) • Often (more than 2 times a week) 	General Habits	General
Do you smoke?	<ul style="list-style-type: none"> • Never • Rarely • Often 	Sensitive Habits	General
Are you sexually active?	<ul style="list-style-type: none"> • Yes • No 	Sensitive Habits	General
Do you suffer from a terminal health condition (e.g., diabetes, high blood pressure)?	<ul style="list-style-type: none"> • Yes • No 	Health	General
Do you take prescription drugs?	<ul style="list-style-type: none"> • Yes • No 	Health	General
Do you use makeup?	<ul style="list-style-type: none"> • Never • Rarely (1-4 times a week) • Everyday 	General Habits	Skin-related
Do you use birth control pills?	<ul style="list-style-type: none"> • Yes • No 	Sensitive Habits	General
What is your level of concern for the environment?	<ul style="list-style-type: none"> • High • Moderate • Low 	Opinions on Non-sensitive Topics	General
Do you oppose testing of skin care products on animals?	<ul style="list-style-type: none"> • No • Somewhat • Very much 	Opinions on Non-sensitive Topics	General
Do you have a preference between natural skin remedies and ingredients or chemically-based ones?	<ul style="list-style-type: none"> • Natural • Chemical • No preference 	Opinions on Sensitive Topics	General

To identify relevant questions, we analyzed a number of websites and online forums concerned with skin care and skin care advice. We identified a large list of factors that can potentially affect choices of skin care products. We then conducted a small pilot where we asked thirteen females to rate 28 potential questions. They rated each question, using a 7-points scale, in terms of its: 1) social sensitivity, 2) relevance to skin care, and 3) their willingness to disclose that information if asked by a skin care expert.

The correlations between the different latent variables in pilot 2 are shown in Table 31.

Table 31. Pilot 2 Correlations

	1	2	3	4	5	6	8	9	10	11	13	14	16	17	18	19	20	21	22	23	24	
1 Positivity	1.00																					
2 Attentiveness	0.89	1.00																				
3 Coordination	0.85	0.83	1.00																			
4 Understanding	0.71	0.73	0.63	1.00																		
5 Validating	0.71	0.71	0.67	0.77	1.00																	
6 Caring	0.69	0.68	0.57	0.80	0.77	1.00																
7 Transparency	0.45	0.50	0.46	0.40	0.54	0.52	1.00															
8 Expressiveness	0.56	0.52	0.48	0.64	0.66	0.77	0.68	1.00														
9 Loss of Privacy	-0.12	-0.10	0.06	-0.07	-0.17	-0.03	-0.06	0.13	1.00													
10 Loss of Face	-0.18	-0.11	-0.10	0.09	-0.24	0.03	-0.18	0.02	0.38	1.00												
11 Perf. Expectancy	0.56	0.60	0.55	0.43	0.37	0.32	0.29	0.23	-0.30	-0.29	1.00											
12 Social Adjustment	0.14	0.15	0.20	0.09	0.27	0.36	0.55	0.56	-0.16	0.06	0.04	1.00										
13 Overall Trust	0.37	0.36	0.16	0.25	0.48	0.37	0.56	0.46	-0.57	-0.55	0.60	0.54	1.00									
14 Benevolence	0.30	0.37	0.23	0.38	0.50	0.61	0.66	0.58	-0.19	-0.28	0.51	0.43	0.67	1.00								
15 Integrity	0.31	0.36	0.31	0.21	0.52	0.44	0.55	0.49	-0.33	-0.35	0.54	0.51	0.70	0.86	1.00							
16 Competence	0.37	0.34	0.33	0.23	0.57	0.38	0.53	0.44	-0.22	-0.47	0.50	0.37	0.72	0.78	0.85	1.00						
17 Dependence - Level	0.01	0.08	0.03	0.34	0.44	0.39	0.39	0.57	-0.11	-0.03	0.24	0.36	0.43	0.61	0.66	0.53	1.00					
18 Dependence - Basis	0.03	-0.08	-0.09	-0.02	0.02	-0.14	-0.32	-0.14	0.17	0.15	-0.36	-0.51	-0.32	-0.48	-0.41	-0.29	-0.22	1.00				
19 Dependence - Interests	0.34	0.43	0.28	0.51	0.38	0.31	0.44	0.43	-0.13	-0.28	0.68	0.05	0.55	0.64	0.66	0.71	0.53	-0.16	1.00			
20 Dis. General	0.34	0.28	0.37	0.11	0.15	-0.04	0.25	-0.01	-0.33	-0.22	0.60	0.01	0.44	0.31	0.34	0.35	-0.04	-0.30	0.27	1.00		
21 Dis. Product	0.39	0.35	0.41	0.15	0.18	0.04	0.22	-0.03	-0.27	-0.27	0.67	-0.08	0.38	0.35	0.34	0.31	-0.10	-0.39	0.25	0.91	1.00	
22 Dis. Sensitive	0.40	0.45	0.45	0.28	0.34	0.24	0.47	0.25	-0.38	-0.39	0.67	0.26	0.57	0.54	0.51	0.41	0.06	-0.37	0.40	0.72	0.76	1.00

Bolding indicates significance at $p < 0.05$.

A.3 Pilot 3

In pilot 3, we introduced a second task. After subjects completed the questionnaire, they were invited to use the virtual advisor in an actual shopping task. As an incentive, subjects were informed that they would be entered into a draw to win one of six \$50 cash prizes that they can use towards buying the recommended product. After this task was completed, subjects were debriefed, where the real purpose of the study was revealed. Approximately 65% of the subjects who completed the questionnaire elected to complete task 2. Surprisingly, all subjects answered all of the questions asked in task 2. This was problematic, as the measure of actual behavior obtained in task 2 manifested zero variance.

Some minor changes were also made to the measurement scales. Transparency was changed to a multi-dimensional construct having three components: 1) insights into “how” the solicited information is processed and can impact the recommendations, 2) insights into “why” the information is solicited, and 3) general insights into what is being done at each stage.

The results from pilot 3 were similar to those obtained in pilot 2.

APPENDIX B

Table 32. Study 1 Summary of Variance Explained – Three Models			
Construct	Variance Explained		
	Model 1	Model 2	Model 3
Perceived Benefits	0.30	0.30	0.27
Perceived Costs	0.11	0.09	0.11
Trust	0.68	0.76	0.74
Perceived Interdependence	0.47	0.49	0.48
Intention to Self-disclose	0.50	0.50	0.50

Table 33. Study 1 Results of the Structural Models – Three Models

#	Hypothesis	Model 1		Model 2		Model 3	
		Effect	t-value	Effect	t-value	Effect	t-value
H1	Perceived costs of disclosure negatively influence the intentions to self-disclose.	-0.31	7.85	-0.32	7.44	-0.32	7.37
H2	Perceived benefits of disclosure positively influence the intentions to self-disclose.	0.48	10.05	0.47	9.13	0.48	9.97
H3	Trust in the advisor positively influences the intentions to self-disclose.	0.16	2.48	0.05	0.76	0.09	1.28
H4	Perceived interdependence positively influences the intentions to self	-0.17	2.98	-0.16	2.61	-0.17	2.75
H5	Perceived responsiveness positively influences the intentions to self-disclose.	0.12	1.98	0.04	0.29	0.08	0.44
H6	Perceived responsiveness positively influences perceived disclosure benefits.	0.50	7.41	0.36	3.70	0.46	4.55
H7	Perceived responsiveness negatively influences perceived disclosure costs.	-0.24	2.72	-0.26	2.52	-0.39	3.45
H8	Perceived responsiveness positively influences trust.	0.35	6.26	0.35	6.14	0.43	7.06
H9	Perceived responsiveness positively influences perceived interdependence.	0.39	6.23	0.45	6.00	0.47	6.14
H10	Perceived rapport positively influences the intentions to self-disclose.	-0.05	0.91	0.15	1.42	0.05	0.42
H11	Perceived rapport positively influences perceived benefits of disclosure.	0.13	2.07	0.32	4.21	0.20	2.32
H12	Perceived rapport negatively influences perceived costs of disclosure.	-0.05	0.66	0.04	0.45	0.16	1.71
H13	Perceived rapport positively influences trust in the virtual advisor.	0.33	6.63	0.39	8.69	0.33	6.44
H14	Perceived rapport positively influences perceived interdependence.	0.09	1.41	0.03	0.31	0.00	0.04
H15	Perceived transparency influences perceived disclosure benefits.	0.36	8.47	0.13	2.69	0.14	2.80
H16	Perceived transparency negatively influences perceived disclosure costs.	-0.03	0.45	-0.05	0.90	-0.08	1.61
H17	Perceived transparency positively influences trust.	0.31	7.87	0.21	6.49	0.23	7.03
H18	Perceived transparency positively influences perceived interdependence.	0.16	3.23	0.11	2.11	0.11	1.97
H19	Perceived expressiveness positively influences perceived disclosure benefits.	-0.43	7.33	-0.27	4.46	-0.01	0.12
H20	Perceived expressiveness negatively influences perceived disclosure costs.	-0.04	0.51	-0.07	1.00	-0.30	4.74
H21	Perceived expressiveness positively influences trust.	0.00	0.03	0.05	1.41	-0.03	0.40
H22	Perceived expressiveness positively influences perceived interdependence.	0.16	2.01	0.19	2.49	0.19	2.20

#

Table 34. Study 1 Loadings and Weights for Second-Order Constructs – Three Models								
	Model 1		Model 2		Model 3			
	Weight	T-value	Weight	T-value	S. Loading	T-value	Weight	T-value
Responsiveness								
Understanding			0.56	8.23	0.93	134.28		
Validating			0.32	4.42	0.93	151.65		
Caring			0.18	2.13	0.95	207.22		
Rapport								
Positivity			-0.06	1.01	0.89	69.26		
Attentiveness			0.66	10.00	0.92	79.74		
Coordination			0.44	5.97	0.93	125.73		
Transparency								
Transparency - Purpose			0.40	2.69	0.95	145.33		
Transparency - Process			0.65	4.74	0.95	167.98		
Perceived Costs								
Loss of Privacy	1.13	11.27	1.13	10.72			1.12	10.57
Loss of Face	-0.18	1.23	-0.18	1.24			-0.17	1.17
Perceived Benefits								
Performance Expectancy	0.94	37.84	0.93	35.79			0.93	31.95
Social Adjustment	0.25	4.20	0.25	4.06			0.27	4.17
Trust								
Competence	0.52	7.34	0.47	7.84			0.46	7.39
Benevolence	0.48	5.94	0.48	6.09			0.47	5.64
Integrity	0.05	0.58	0.10	1.39			0.12	1.53

Table 34. Study 1 Loadings and Weights for Second-Order Constructs – Three Models (continued)

	Model 1		Model 2		Model 3			
	Weight	T-value	Weight	T-value	S. Loading	T-value	Weight	T-value
Interdependence								
Level of Dependence	-0.33	4.36	-0.40	6.05			-0.40	5.62
Basis of Dependence	0.29	4.92	0.29	4.39			0.29	4.67
Covariation of Interests	0.75	12.99	0.70	11.74			0.70	10.73
Intention to Self-disclose								
Demographical information	0.06	0.49	0.10	0.89	0.75	9.30	0.08	0.60
Information about your general habits	0.13	1.42	0.15	1.44	0.76	12.27	0.14	1.52
Information about your sensitive habits	0.19	3.09	0.19	2.72	0.71	14.18	0.20	2.97
Information about your skin care needs	0.62	4.32	0.67	5.05	0.77	9.93	0.65	4.58
Information about your product preferences	-0.48	3.49	-0.53	3.81	0.73	9.95	-0.53	4.21
Information about your health	0.49	5.41	0.45	4.34	0.93	37.35	0.48	3.62
Your feelings, opinions and judgments about non-sensitive topics	0.12	1.31	0.07	0.81	0.73	12.70	0.10	0.99
Your feelings, opinions and judgments about sensitive topics	0.03	0.17	0.07	0.39	0.76	12.86	0.04	0.17

APPENDIX C

Table 35. Study 2 – Treatment Means for Object-based Beliefs

	Rapport	Responsiveness	Transparency	Expressiveness
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Treatment 1 (N = 20)	3.57 (1.31)	4.05 (1.22)	2.76 (1.32)	2.45 (1.15)
Treatment 2 (N = 25)	3.67 (1.19)	4.60 (0.98)	4.31 (1.52)	3.16 (1.17)
Treatment 3 (N = 30)	4.16 (1.31)	4.96 (1.10)	4.53 (1.46)	3.61 (1.37)
Treatment 4 (N = 29)	4.40 (1.00)	5.32 (0.83)	5.44 (1.30)	3.84 (1.11)
Treatment 5 (N = 25)	3.92 (1.53)	5.10 (1.26)	3.78 (1.33)	4.27 (1.63)
Treatment 6 (N = 22)	4.39 (1.41)	5.44 (0.92)	4.44 (1.36)	4.85 (1.15)
Treatment 7 (N = 21)	4.44 (1.19)	5.36 (0.80)	4.57 (1.16)	4.71 (1.20)
Treatment 8 (N = 23)	4.70 (1.12)	5.65 (0.79)	5.29 (1.00)	4.90 (0.88)
Total (N = 195)	4.16 (1.29)	5.07 (1.09)	4.44 (1.51)	3.96 (1.44)

Table 36. Study 2 – Effects of Design Elements

Dependent Variable: Perceived Rapport					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	3305.475	1	3305.48	2072.12	0.00
Why-Explanations [WE]	3.436	1	3.44	2.15	0.14
How-Explanations [HE]	13.833	1	13.83	8.67	0.00
Expressive Speech Acts [EA]	8.270	1	8.27	5.18	0.02
WE * HE	0.017	1	0.02	0.01	0.92
WE * EA	0.428	1	0.43	0.27	0.60
HE * EA	0.743	1	0.74	0.47	0.50
WE * HE * EA	0.408	1	0.41	0.26	0.61
Error	298.306	187	1.60		
Total	3699.778	195			
Dependent Variable: Perceived Responsiveness					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	4900.631	1	4900.63	4865.43	0.00
Why-Explanations [WE]	7.174	1	7.17	7.12	0.01
How-Explanations [HE]	13.107	1	13.11	13.01	0.00
Expressive Speech Acts [EA]	20.611	1	20.61	20.46	0.00
WE * HE	0.169	1	0.17	0.17	0.68
WE * EA	0.222	1	0.22	0.22	0.64
HE * EA	4.032	1	4.03	4.00	0.05
WE * HE * EA	0.060	1	0.06	0.06	0.81
Error	188.353	187	1.01		
Total	5242.938	195			

Table 36. Study 2 – Effects of Design Elements (continued)

Dependent Variable: Perceived Transparency					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	3591.46	1	3591.46	2372.07	0.00
Why-Explanations [WE]	35.36	1	35.36	23.35	0.00
How-Explanations [HE]	45.86	1	45.86	30.29	0.00
Expressive Speech Acts [EA]	3.01	1	3.01	1.99	0.16
WE * HE	0.77	1	0.77	0.51	0.48
WE * EA	3.48	1	3.48	2.30	0.13
HE * EA	4.42	1	4.42	2.92	0.09
WE * HE * EA	1.45	1	1.45	0.95	0.33
Error	283.13	187	1.51		
Total	4112.56	195			
Dependent Variable: Perceived Expressiveness					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	3024.693	1	3024.69	1990.58	0.00
Why-Explanations [WE]	8.813	1	8.81	5.80	0.02
How-Explanations [HE]	16.339	1	16.34	10.75	0.00
Expressive Speech Acts [EA]	96.337	1	96.34	63.40	0.00
WE * HE	2.253	1	2.25	1.48	0.22
WE * EA	0.093	1	0.09	0.06	0.80
HE * EA	5.442	1	5.44	3.58	0.06
WE * HE * EA	0.019	1	0.02	0.01	0.91
Error	284.148	187	1.52		
Total	3466.375	195			

Table 37. Study 2 Structural Model Results Assuming Full Mediation

	Negative Emotions			Positive Emotions			Intentions to Disclose			In. to Disclose Accurately		
	LP	LF	R ²	PE	NO	R ²	NEE	POE	R ²	NEE	POE	R ²
Reflective Model	<u>0.15</u>	<u>0.41</u>	0.29	<u>0.17</u>	<u>0.36</u>	0.22	<u>-0.39</u>	<u>0.33</u>	0.35	<u>-0.32</u>	<u>0.29</u>	0.25
Formative Model	<u>0.10</u>	<u>0.54</u>	0.39	<u>0.17</u>	<u>0.36</u>	0.22	<u>-0.62</u>	<u>0.26</u>	0.54	<u>-0.62</u>	<u>0.18</u>	0.47

LP: Perceived Loss of Privacy

LF: Perceived Loss of Face

PE: Perceived Performance Expectancy

NO: Perceived Novelty

NEE: Experienced Negative Emotions

POE: Experienced Positive Emotions

- Underlined numbers indicate significance at $p < 0.05$

Table 38. Study 2 Structural Model Results for Each Information Type – Partial Mediation

	Negative Emotions			Positive Emotions			Intentions to Disclose						Intentions to Disclose Accurately							
	LP	LF	R ²	PE	NO	R ²	LP	LF	PE	NO	NEE	POE	R ²	LP	LF	PE	NO	NEE	POE	R ²
Skin care needs and type	<i>0.11</i>	<u>0.21</u>	0.09	<u>0.17</u>	<u>0.36</u>	0.22	<u>0.15</u>	<i>-0.09</i>	<u>0.09</u>	0.02	<u>-0.30</u>	<u>0.24</u>	0.22	<u>0.19</u>	<u>-0.14</u>	<u>0.10</u>	-0.02	<u>-0.18</u>	<u>0.22</u>	0.14
Specific skin conditions	<i>0.09</i>	<u>0.26</u>	0.11	<u>0.17</u>	<u>0.36</u>	0.22	0.07	<i>-0.05</i>	<u>0.10</u>	<u>0.09</u>	<u>-0.30</u>	<u>0.26</u>	0.27	<u>0.12</u>	<u>-0.12</u>	<u>0.10</u>	0.03	<u>-0.21</u>	<u>0.23</u>	0.18
Demographics	<u>0.21</u>	<u>0.12</u>	0.10	<u>0.17</u>	<u>0.36</u>	0.22	<i>-0.07</i>	0.00	<u>0.11</u>	<u>0.17</u>	<u>-0.39</u>	<u>0.11</u>	0.33	<i>-0.01</i>	0.02	<u>0.11</u>	<u>0.14</u>	<u>-0.33</u>	<u>0.11</u>	0.22
Skin care related habits	<u>0.13</u>	<u>0.22</u>	0.11	<u>0.17</u>	<u>0.36</u>	0.22	0.09	<i>-0.08</i>	<u>0.11</u>	0.05	<u>-0.29</u>	<u>0.23</u>	0.23	<i>0.10</i>	<u>-0.14</u>	<u>0.14</u>	0.01	<u>-0.24</u>	<u>0.19</u>	0.20
Sensitive habits	<u>0.17</u>	<u>0.44</u>	0.33	<u>0.17</u>	<u>0.36</u>	0.22	<i>-0.02</i>	<i>-0.12</i>	<u>0.26</u>	<u>0.15</u>	<u>-0.28</u>	0.07	0.41	<i>-0.07</i>	<i>-0.01</i>	<u>0.23</u>	<i>0.08</i>	<u>-0.38</u>	<u>0.12</u>	0.39
Medical history / health-related	<u>0.11</u>	<u>0.55</u>	0.40	<u>0.17</u>	<u>0.36</u>	0.22	0.03	<i>-0.14</i>	<u>0.23</u>	<u>0.27</u>	<u>-0.36</u>	0.02	0.56	0.06	<u>-0.15</u>	<u>0.19</u>	<u>0.12</u>	<u>-0.39</u>	<u>0.10</u>	0.43
Changes and experiences	<u>0.10</u>	<u>0.45</u>	0.28	<u>0.17</u>	<u>0.36</u>	0.22	0.02	<u>-0.12</u>	<u>0.23</u>	<u>0.19</u>	<u>-0.40</u>	<u>0.10</u>	0.56	0.02	<u>-0.13</u>	<u>0.24</u>	<u>0.09</u>	<u>-0.33</u>	<u>0.15</u>	0.43
Opinions about certain topics	<u>0.11</u>	<u>0.31</u>	0.17	<u>0.17</u>	<u>0.36</u>	0.22	0.05	<u>-0.13</u>	<u>0.25</u>	<i>0.07</i>	<u>-0.37</u>	<u>0.18</u>	0.45	0.05	<u>-0.18</u>	<u>0.20</u>	0.02	<u>-0.24</u>	<u>0.16</u>	0.28

LP: Perceived Loss of Privacy

LF: Perceived Loss of Face

PE: Perceived Performance Expectancy

NO: Perceived Novelty

NEE: Experienced Negative Emotions

POE: Experienced Positive Emotions

- Underlined numbers indicate significance at $p < 0.05$

- Italicized numbers indicate significance at $p < 0.10$

Table 39. Study 2 Structural Model Results for Each Information Type – Full Mediation

	Negative Emotions			Positive Emotions			Intentions to Disclose			In. to Disclose Accurately		
	LP	LF	R ²	PE	NO	R ²	NEE	POE	R ²	NEE	POE	R ²
Skin care needs and type	<i>0.11</i>	<u>0.21</u>	0.09	<u>0.17</u>	<u>0.36</u>	0.22	<u>-0.30</u>	<u>0.27</u>	0.20	<u>-0.18</u>	<u>0.24</u>	0.11
Specific skin conditions	<i>0.09</i>	<u>0.26</u>	0.11	<u>0.17</u>	<u>0.36</u>	0.22	<u>-0.30</u>	<u>0.33</u>	0.25	<u>-0.22</u>	<u>0.28</u>	0.15
Demographics	<u>0.21</u>	<u>0.12</u>	0.10	<u>0.17</u>	<u>0.36</u>	0.22	<u>-0.43</u>	<u>0.22</u>	0.28	<u>-0.35</u>	<u>0.20</u>	0.19
Skin care related habits	<u>0.13</u>	<u>0.22</u>	0.11	<u>0.17</u>	<u>0.36</u>	0.22	<u>-0.29</u>	<u>0.39</u>	0.21	<u>-0.25</u>	<u>0.36</u>	0.16
Sensitive habits	<u>0.17</u>	<u>0.44</u>	0.33	<u>0.17</u>	<u>0.36</u>	0.22	<u>-0.42</u>	<u>0.21</u>	0.27	<u>-0.47</u>	<u>0.22</u>	0.33
Medical history / health-related	<u>0.11</u>	<u>0.55</u>	0.40	<u>0.17</u>	<u>0.36</u>	0.22	<u>-0.54</u>	<u>0.21</u>	0.40	<u>-0.51</u>	<u>0.21</u>	0.36
Changes and experiences	<u>0.10</u>	<u>0.45</u>	0.28	<u>0.17</u>	<u>0.36</u>	0.22	<u>-0.54</u>	<u>0.25</u>	0.44	<u>-0.44</u>	<u>0.26</u>	0.34
Opinions about certain topics	<u>0.11</u>	<u>0.31</u>	0.17	<u>0.17</u>	<u>0.36</u>	0.22	<u>-0.44</u>	<u>0.29</u>	0.36	<u>-0.31</u>	<u>0.25</u>	0.21

LP: Perceived Loss of Privacy

LF: Perceived Loss of Face

PE: Perceived Performance Expectancy

NO: Perceived Novelty

NEE: Experienced Negative Emotions

POE: Experienced Positive Emotions

- Underlined numbers indicate significance at $p < 0.05$

- Italicized numbers indicate significance at $p < 0.10$