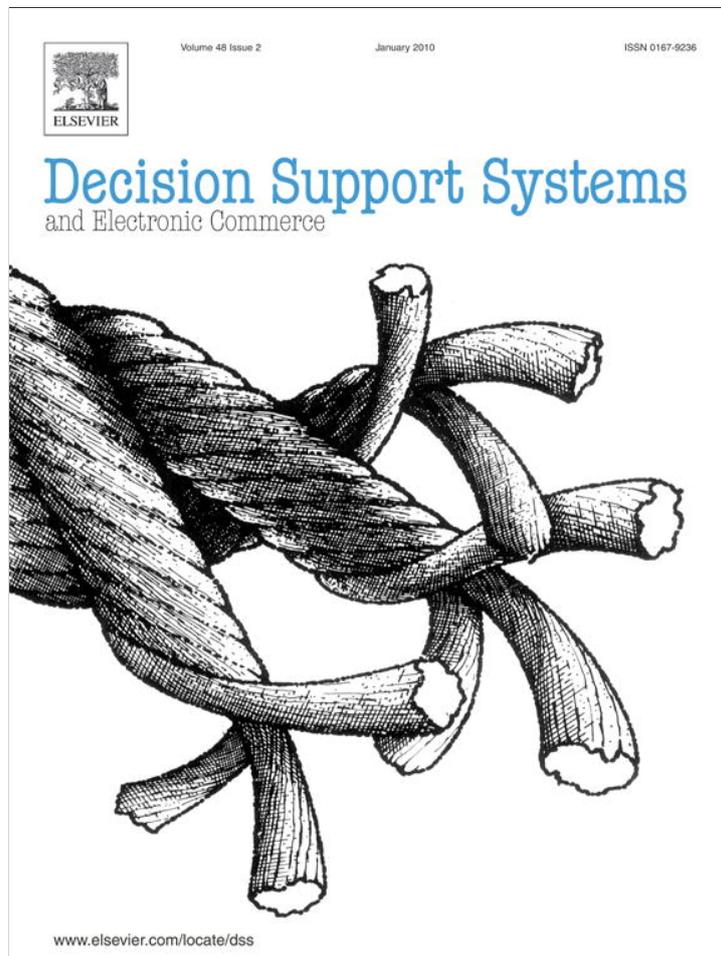


Provided for non-commercial research and education use.
Not for reproduction, distribution or commercial use.



This article appeared in a journal published by Elsevier. The attached copy is furnished to the author for internal non-commercial research and education use, including for instruction at the authors institution and sharing with colleagues.

Other uses, including reproduction and distribution, or selling or licensing copies, or posting to personal, institutional or third party websites are prohibited.

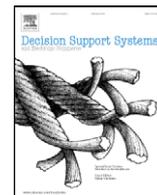
In most cases authors are permitted to post their version of the article (e.g. in Word or Tex form) to their personal website or institutional repository. Authors requiring further information regarding Elsevier's archiving and manuscript policies are encouraged to visit:

<http://www.elsevier.com/copyright>



Contents lists available at ScienceDirect

Decision Support Systems

journal homepage: www.elsevier.com/locate/dss

Knowing your customers: Using a reciprocal relationship to enhance voluntary information disclosure[☆]

J. Christopher Zimmer^c, Riza Aarsal^a, Mohammad Al-Marzouq^d, Dewayne Moore^b, Varun Grover^{a,*}

^a Department of Management, Clemson University, United States

^b Department of Psychology, Clemson University, United States

^c Department of Management, Le Moyne College, United States

^d Department of Quantitative Methods and Information Systems, Kuwait University

ARTICLE INFO

Article history:

Received 7 March 2008

Received in revised form 2 October 2009

Accepted 14 October 2009

Available online 22 October 2009

Keywords:

Information disclosure

Theory of reasoned action

Social response theory

Experimental design

Disclosure intent

Actual disclosure

ABSTRACT

Customer information is increasingly being solicited by organizations as they try to enhance their product and service offerings. Customers are becoming increasingly protective of the information they disclose. The prior research on information disclosure has focused on privacy concerns and trust that lead to intentions to disclose. In this study, we tread new ground by examining the link between intent to disclose information and the actual disclosure. Drawing from social response theory and the principle of reciprocity, we examine how organizations can influence the strength of the link between intent and actual disclosure. We conduct an experiment using 15 pieces of information in a non-commercial context that examines voluntary individual information disclosure. Our results indicate that by implementing a *reasoned dyadic* condition where the organization provides reasoning on why they are collecting particular information; individuals are more likely to actually disclose more information. The results open up opportunities to go beyond intent, and study the actual disclosure of sensitive information. Organizations can use the concept of reciprocity to enhance the design of information acquisition systems.

© 2009 Elsevier B.V. All rights reserved.

1. Introduction

Firms that are able to effectively obtain information to better know their customers have advantage in today's competitive marketplace [53]. These firms have more strategic options with respect to customization and innovation, since the target of their strategies is better understood [61]. Innovations can be in the form of new product development, or incremental improvements to existing products. For instance, firms can include customer preferences in the design of their products so that they closely match customer needs and give the firm a competitive edge over its competition. This new paradigm accomplished with economies of scale reflects mass customization that is very different from the mass production mentality of the past. In today's marketplace, mass customization is information intensive requiring the quick collection and processing of large amounts of data about consumers, and is uniquely suited to an online environment [2].

However, customer information is not easily obtained. Consumers are becoming increasingly aware of the potential value and risks of

sharing their personal information [40]. So while organizations need consumers to share their personal information, there is concern about how this information will be used. All too frequently news stories appear of how private personal information has been breached by unethical outsiders or misused by organizations [102].

For customers, a trade-off exists between disclosing personal information to receive better products or services, and withholding personal information to maintain privacy. Consequently, organizations need to strike a balance between their need for personal customer information and alleviating the concerns of the customer. Organizations risk alienating customers if they come across as too invasive in acquiring personal information. To avoid this, organizations must understand how their customers react to trade-offs between disclosure and with privacy, and design their information acquisition processes accordingly.

Prior work has identified numerous traits that impact attitudes and intent formation such as concerns for privacy, trust in Web site, and risk [24,51,62,93]. Organizations expend effort in trying to alleviate individual concerns about disclosure by focusing on factors that influence intentions (e.g. privacy policies, certificates, building trust). However, it is unclear whether influencing attitudes or intentions results in changed disclosure behavior. For instance, some studies that have investigated the link between attitudes and actual behavior have often found no association between these whatsoever [104,106]. Without investigating actual disclosure, we cannot understand how to truly influence consumers' disclosure behavior.

[☆] The authors wish to thank two anonymous reviewers for their constructive comments that greatly helped improve the paper. We would also like to thank one of the reviewers for suggesting the term "reasoned dyadic."

* Corresponding author. Fax: +1 864 656 6768.

E-mail addresses: zimmejoc@lemoyne.edu (J.C. Zimmer), rarsal@clemson.edu (R. Aarsal), malmarz@clemson.edu (M. Al-Marzouq), moore@clemson.edu (D. Moore), vgrover@clemson.edu (V. Grover).

The purpose of this paper is to broaden our understanding of the disclosure process by exploring strategies that organizations might employ to influence the information disclosure process. We argue that prior work on this has limited utility as the actionable realm of the disclosure process (actual disclosure behavior) remains understudied. Most prior studies are based on the theory of reasoned action which purports that behavior follows intent to perform the said behavior [4,33]. Intent is typically used as a proxy for actual behavior in IS studies. Since intent is only correlated with actual behavior, particularly in the case of information disclosure, our goal is to measure actual information disclosure. We aim to *expand the nomological network to include actual disclosure behavior and focus on social actionable techniques that organizations can use to facilitate the causal link between intent and the actual disclosure decision.*

The rest of this paper is organized as follows. First we review existing IS information disclosure literature and use it to position our study. Next, we develop a model and propose hypotheses for online information disclosure, drawing upon the theory of reasoned action and social response theory. We use the theoretical frame to develop mechanisms that enhance voluntary information disclosure. We then empirically test the model in an experimental setting with an established Web site and a potential consumer sample. Finally, we discuss the implications of these results for design of systems to enhance disclosure.

2. Theoretical development

Most of the studies in IS information disclosure research, with the exception of Berendt, Günther, and Spiekermann [12], have focused on the cognitive/perceptual realm, with some form of privacy calculus. The model for these studies is depicted on the left side of Fig. 1. The basic idea in these studies is that an individual forms an intention on whether to disclose or not by weighing the benefits against the risks of disclosing personal information. These studies focus on the utilitarian determinants of intention and assume that behavior will follow the individual's behavioral intentions.

Meta-analytic studies have found that the correlation between intent and actual behavior is only of the order of 0.53, and the amount of variation in behavioral intent accounts for ranges between 20% and 30%. Some researchers have found the correlation to be as low as 0.21 and the R^2 to be as low as 0.04 [9,51,89,95]. This casts doubts over the assumption in most IS disclosure work that actual disclosure behavior will follow from intentions to disclose. In fact, even studies that focus on online user behaviors and do not measure the actual behavior acknowledge this limitation and argue that "one with behavioral intention volitionally intends to follow the advice, purchase, and/or share information, *unless something precludes such action*" [66]. It is our contention that in the case of information disclosure, there is

particular resistance to *actually giving up* personal information even after intentions are formed.

Understanding factors that alleviate this resistance could facilitate the design of better information acquisition processes. Once intent is formed one of two basic outcomes occurs — either intent matches behavior or it does not. This study investigates what organizations can do, besides offering explicit benefits (e.g., money or rewards) for their customers, to maximize voluntary individual disclosure behavior. We propose that organizations could leverage social techniques to maximize the probability of disclosure when intent is low and minimize the probability of nondisclosure when intent is high. We will test this claim while accounting for the potential influences studied in prior empirical work. We will also emphasize the part where prior studies have stopped, in the actionable realm of Fig. 1, after intentions are formed.

While the theory of reasoned action (TRA) provides support for our base hypothesis, we use social response theory (SRT) to inform our discussion on actual disclosure. SRT covers the mechanisms organizations can use to influence disclosure. In Fig. 1, TRA and SRT have elements in both the cognitive / perceptual realm and the actionable/behavioral realm. In Fig. 1, TRA is represented as the main chain from beliefs to actual disclosure (thick arrow) while SRT informs the process that can influence actual behavior in the actionable realm.

2.1. Cognitive realm: forming behavioral intentions

While the focus of our study is the relationship between the intention and actual behavior, it is also important to consider how consumer intentions are formed in order to provide a richer view of the nomological network of information disclosure. We consider antecedents to intent to allow comparisons of this work with other works in this area. Although numerous factors contribute to the formation of disclosure intention, consumers' online privacy concerns and trust in a website are two most salient beliefs that consistently receive theoretical and empirical support [48,62–65,98].

We selected privacy and trust because they are two complementary constructs. They are perceptions of how the organization could potentially abuse an individual's personal information (trust) and how the individual will react to this abuse (privacy). Since our primary focus is on the right side (actionable realm) of Fig. 1, we restrict our focus to these two important antecedents. Other relationships that have been studied between antecedents like risk and it trust [63,64] are outside the scope of this study. For more on relationships between trust, risk and the formation of intent the reader is directed to [11,14,22,32,42,46,50,63,75,87,90,92,94,97,101].

2.1.1. Trust in e-vendor

Fueled by the growth of Web technologies, individuals find themselves conducting transactions and disclosing personal information

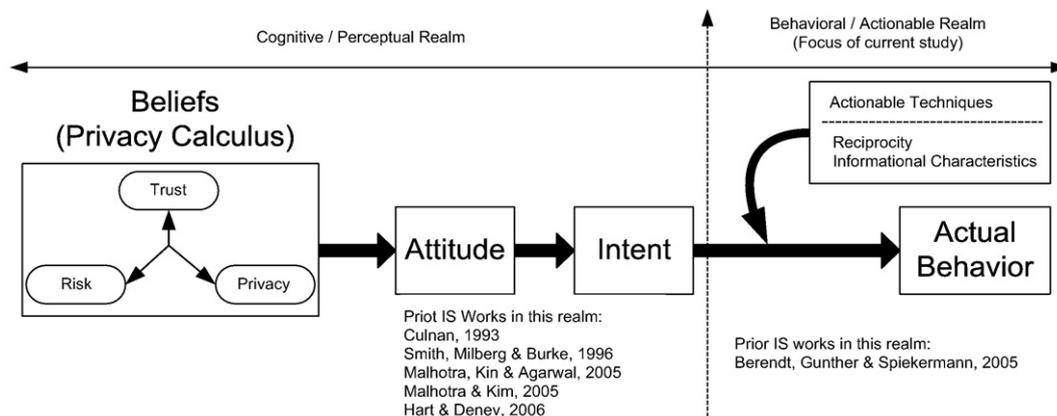


Fig. 1. Nomological model.

in “e-environments”, where uncertainty is considerably larger than traditional brick-and-mortars [45]. This increased uncertainty stems from the spatial and temporal distance between the consumers and e-vendors, resulting with a heightened risk of opportunistic behavior by the vendors [36,65]. Trust in e-vendors is important because it subjectively reduces the risk perceptions of undesired vendor behaviors such as sharing of private information with third parties without the consent of consumers. Therefore, there has been a surge of research focused on the importance of developing and maintaining customer trust in the context of e-commerce [36,38,54,73].

Consistent with prior research, we define trust as “a consumer's assessment or belief that a e-vendor is trustworthy” [36,37]. The trustworthiness of a vendor refers to how a consumer perceives the integrity, ability, predictability, and benevolence of the vendor [37]. Trusting beliefs in e-vendors are expected have a positive influence on trusting intentions of consumers. For example, Malhotra et al. [62] found out a positive relationship between trust in e-vendor and intention to disclose personal information. Other researchers demonstrated similar findings between trust and intention to engage in online transactions with an e-vendor [38,65,73,74]. Therefore, we hypothesize that:

H1. Trust in e-vendor will positively influence intention to disclose personal information to an e-vendor.

2.1.2. Privacy concerns

Privacy concerns refer to consumers' subjective views of fairness within the context of information privacy [62]. Because of the uncertainty related to online transactions, sharing personal information makes the individual vulnerable to loss of privacy, misuse of the information by the vendor, or even the theft of one's identity [24,93]. These privacy concerns have been suggested as one of the biggest obstacles to the adoption of e-commerce [45]. Privacy and e-commerce research consistently emphasizes the negative influence of privacy concerns on disclosure and purchase intentions in online environments [28,30,62]. Therefore, consumers with high privacy concerns are expected to be reluctant to disclose personal and sensitive information to e-vendors.

H2. Information privacy concerns will negatively influence intention to disclose personal information to an e-vendor.

2.2. Actionable realm: the theory of reasoned action

TRA postulates that behavior results from forming an intention to perform a behavior [4,33]. Ideally intent and behavior will match, but this is not always the case as discussed above. While investigating the entire chain of events leading to behavior is important, this study will start where most studies end – with intent. So intentions have already been formed and individuals are past the privacy calculus stage [29]. While some studies have found a very low correlation between behavioral intent and actual behavior, most have found a relationship between them [e.g. 1]. Based on TRA and prior work we expect the following baseline hypothesis to be supported:

H3. (Baseline): There will be a positive relationship between intent to disclose and actual disclosure.

2.3. Social response theory (SRT)

SRT states that people will engage in self disclosing behavior if they are the recipient of a similar disclosure from their partner first [8,17,18,20,23,44,52,69,80,88]. By capitalizing on this tendency, the probability of disclosure can be increased. To do this effectively, the interaction should start with exchanges of less intimate (or less sensitive) information and build up to the exchange of more intimate information [69].

The tendency to disclose in response to a prior disclosure is known as the principle of reciprocity [31,69,70,80,99]. Reciprocity involves feelings of obligation within an individual to divulge something in return when the individual becomes the recipient of something similar, and is one of the guiding forces in human interaction.

There is some evidence that insights from SRT can be used to get individuals to divulge intimate information about themselves to computers. Moon [69] found that individuals were willing to reciprocate with computers in making intimate disclosures. However, we would like to examine this in a more contemporary online setting to see if building a reciprocal relationship with Web site visitors is a viable strategy in getting them to disclose intimate information about themselves. However, building a reciprocal relationship in an online setting is contingent upon (i) individuals relating to the Web site as if it were a social actor (i.e. another individual) where the technology casts a social presence, and (ii) understanding ways in which the individual and the Web site become an interacting dyad in a computer mediated environment, subject to the normal rules of any typical social interaction. Below, we briefly describe SRT in the context of (i) and (ii).

2.4. Web site as a social actor

There are some researchers that argue that a Web site can be conceived of as a valid social actor, characterized in much the same way as any other interpersonal relationship [55,56]. This type of presence has been discussed since the advent of television, with Horton and Wohl [47] observing that even though the relationship between a TV personality and viewer is inherently one-sided, the personality can create a para-social presence by incorporating various social cues into their mannerisms on camera. These include making eye contact with the viewer via the camera, informal speech patterns, and a conversational give and take. Actors on television programs filmed in front of a live audience play to the cameras instead of the audience specifically to create the social presence for the viewer at home. Viewers respond to the social cues or even talk to the screen despite the fact that it is illogical to do so [57,59].

Lombard and Ditton [60] reviewed different types of social presence stemming from various disciplinary approaches to researching this phenomenon. For instance, they state that social presence could be conceptualized as medium as an actor, or actor within a medium. When the medium is an actor, the technology itself becomes part of the interacting dyad rather than enabling two distant communicators to interact. Technologies can be programmed to use natural language and interact in real time, so when they fulfill traditional social roles (teller machines) novice and experienced users alike treat the machine as a social entity and the findings seen in human–human interactions are also seen in human–computer interactions [69–71].

When disclosing information to a Web site, equivocality exists in the nature of the social relationships being formed. It is unclear whether the relationship that is formed is with the computer, the Web site or the individuals at the company behind the Web site. Some researchers argue that relationships cannot be formed with technological artifacts due to the fact that they lack such qualities such as consciousness or agency [35]. Others have demonstrated in controlled lab experiments that users anthropomorphize technological artifacts during their interactions with the technology, but afterwards freely admit their behavior was illogical [70].

Wang and Benbasat [103] showed that trust between a Web site and its visitors can be established. While it cannot be determined if the trust relationship is with the humans who programmed the technology or with the technology itself a growing number of studies show that individuals treat technology as a social actor [69,70,72,103].

In terms of this study, we capitalize on an individual's tendency to respond in a like manner to social cues regardless of whom or what extends the social cue. So whether presence is the result of a person feeling a social actor is communicating through a medium or the

medium itself is the source of the communication, we assume that a para-social presence will be established. This sets up the necessary condition for building a reciprocal relationship. Below, we discuss the actionable domain, or what comprises the nature of the reciprocal relationship itself.

2.5. Dyadic conditions

Not everyone has the same level of intention to disclose information. The goal of the organization requesting information is to maximize the probability of disclosure. In essence the organization wants to achieve two complementary goals – maximizing the probability of disclosure when intent is low and minimizing the probability of nondisclosure when intent is high.

We contend that the organization can create or implement conditions to increase disclosure behavior once the individual has formed their initial intention to disclose, which will impact the likelihood of disclosure. We also contend that the limited strength of this relationship demonstrated in prior empirical work [9,51,89,95], leaves room for improvement through social actions. An organization can create conditions amenable to disclosure when intent is low and nondisclosure when intent is high.

Social response theory (SRT) informs a discussion of how reciprocity can influence the intent to actual behavior link. Two important aspects of reciprocity will be borrowed from the SRT. One is the feeling of obligation within an individual to divulge intimate information in return when the individual becomes the recipient of equally intimate information. The other is the conversational sequence, which is the flow of the conversation from less intimate disclosure to highly intimate [69]. The task of collecting data through the reciprocation strategy will involve questions and information exchange. While communication could take many forms, textual communication is appropriate to cast a para-social presence [49,69,81,91].

Traditionally information is collected by simply asking for it. This is the lowest level of interaction (i.e. no reciprocity) and will be referred to as the nondyadic condition (ND). Increasing the details in the request through reciprocity can enrich the interaction and influence disclosure rates [69]. This is achieved through disclosing something similar to what is being requested, this will be referred to as the unreasoned dyadic condition (UD). The richest level of interaction is when something similar is disclosed in addition to a reasoning of why the information is needed or how it will be used, this will be referred to as the reasoned dyadic condition (RD).

This work extends Moon's (2000) earlier work with the inclusion of the reasoned dyadic condition. Her objective was to elicit more detailed disclosure by sharing something similar. We extend her work with the inclusion of the reasoned dyadic condition. Our goal with the reasoned dyadic is twofold; first it serves to reassure those who already intend to share a piece of information that they should continue to intend to share. Second it is an attempt to persuade individuals who may not intend to

share their information to reconsider that decision by giving them a reason why it is needed.

Our contention is that Web sites that provide richer information to their customers will most likely invoke stronger feelings of reciprocity and make it more likely that individuals will decide to disclose to the Web site, provided they follow proper conversational sequence in doing so. It follows that

H4a. The unreasoned dyadic condition (UD) will positively moderate the relationship between intent and probability of disclosure.

H4b. The reasoned dyadic condition (RD) will positively moderate the relationship between intent and probability of disclosure.

H4c. The reasoned dyadic condition will show the stronger moderation effect on the relationship between intent and probability of disclosure.

In sum, we argue from TRA that intent to disclose leads to actual disclosure. From SRT, reciprocity, manifested through a dyadic relationship, and information sequence will both have an impact on how effective the dyadic relationship influences the disclosure process. A summary of the model is provided in Fig. 2, and construct definitions are in Table 1.

3. Research method

In order to manage treatments of various dyadic conditions in a controlled environment, data was collected in an experimental setting. Criteria for participant selection, Web site selection, and construct measurement are described below.

3.1. Participants

The criterion for inclusion in the experiment was established a-priori. Participants needed to be familiar and have experience with typical computer equipment. Also, participants needed to have prior experience and familiarity with the Internet in general. The net effect of these restrictions skews the sample population from the general population to a younger, more highly educated demographic because computer users tend to be younger and better educated than the general population at large [82].

A potential sample frame that met this requirement was undergraduate students at a large US research university. These students were enrolled in a course on business decision making that involved computer usage. While some work has criticized using students as subjects in organizational research [c.f. 39] we contend that students are an entirely appropriate sample for this research for two reasons. First, individual disclosure to an organization is the focus of the study, not the organization itself. Thus participants need not be members of the organization requesting the information. Second, the application of this research has direct implications for e-commerce so participants need to reflect the typical customer segment that engages in e-commerce.

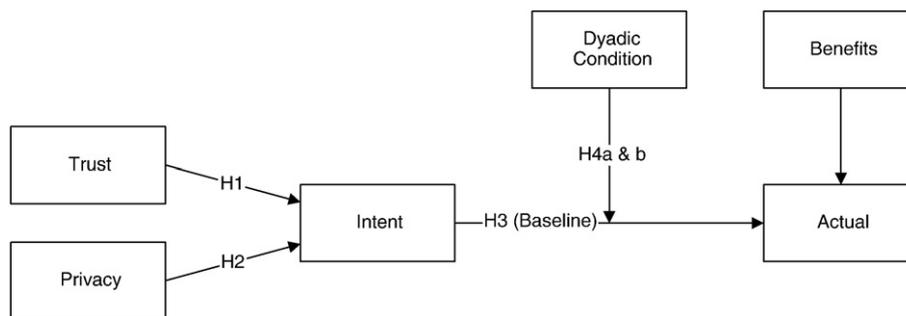


Fig. 2. Research model.

Table 1
Constructs and their definitions.

Construct	Definition
Intent to disclose	Whether an individual plans to disclose (or not) a piece of information
Dyadic relationship	Nondyadic: No information is given to the individual other than simply requesting what is wanted. Unreasoned Dyadic: The organization discloses something similar to the individual first. Reasoned Dyadic: The organization discloses something similar first and as part of the request for information, tells why they want it as well.

Students satisfy this requirement, with some researchers even referring to students as the next generation of e-commerce users [82].

Participants were recruited from a pool of business management students who were predominantly under the age of 25, and were approximately equally distributed along gender lines. Of the 1000 students that were invited, 264 participated in the research, representing a 26.4% raw participation rate. Some of the data was unusable and had to be removed, which reduced the final sample to 236 participants, and a 23.6% final participation rate. Even though the focus of this research is on actual disclosure, to increase the generalizability of the findings, participants needed to display a broad range of levels of intent. Prior work has demonstrated that concerns for privacy and trust in a Web site are related to intent [24,62,93]. The sample exhibits a broad range on intent to disclose to the target site as well as other well established antecedents to intent like privacy concerns and trust. 7-point scales were used and summary statistics and correlations are shown in Table 2.

To receive IRB approval for this study the research team was not allowed to gather any demographic data about the participants. This restriction was placed to protect the anonymity of students during the disclosure process since the study involved two types of deliberate deception. First, students were deceived into thinking they were disclosing to a real website (WebMD) and second they were deceived into thinking that their information was being captured. It was not until a debriefing session after the experiment was completed that student learned that they were not disclosing to the real site and that their information was not being captured.

3.2. Web site selection

Three selection criteria for the test Web site were developed. First, the site needed to be a *real functioning Web site* as opposed to one created by the investigators. While experiments offer the benefit of control to the researchers, control comes at the cost of realism. Prior research involving information sensitivity used a fabricated Web site, but this study did not measure actual disclosure [105]. It was determined that to have participants disclose to an experimentally created Web site undermines reality to an unacceptable degree.

Second, the site needed to have *legitimate reason* to ask for sensitive information. With a commerce site, there is a legitimate need for certain types of information. Purchasing a good or service is a transaction that carries some risk. By exchanging information both parties are legally protected in case of a dispute. When the financial aspects of a transaction are removed, the major impetus for asking for sensitive

information is not present. For example downloading software, the vendor has legitimate business need to ask for e-mail and information pertaining to the downloader's computer. Neither of these pieces of information is particularly sensitive.

Third, the site's *content needed to be free* to ensure that the information that is disclosed is voluntary. This gives a truer measure of the effect of the dyadic conditions by minimizing the effects of perceived benefits as much as possible. While we are not naïve enough to think people will disclose sensitive information without regard to benefits, we are interested in organizational strategies beyond benefits can enhance disclosure behavior.

The challenge was therefore to find a free Web site that has a legitimate reason to ask for sensitive information. Prior work involving information sensitivity has used medical information [83]. This meets the legitimate need for sensitive information requirement. Medical information runs the gamut from low sensitivity (have you ever taken an OTC cold medicine?) to highly sensitivity (are you currently on any anti-HIV medications?) and people would reasonably expect a-priori that a medical Web site might ask sensitive questions. Because SRT posits that individuals will disclose information if they receive similar information first [8,17,18,20,23,44,52,69,80,88], the chosen Web site also needs to legitimately provide information – such as an advice giving site.

WebMD.com was selected as the target Web site. It is a Web site that most people have heard of which establishes realism within the experimental design. Most of its content is free, and as a medical Web site, it is reasonable that visitors would have the opportunity to potentially disclose highly sensitive information. Furthermore it offers advice and information about numerous medical maladies and conditions making it an appropriate choice for use in this study.

3.3. Control variables

Despite focusing on voluntary disclosure, the benefits that accrue to the individual from disclosure can impact intent to disclose. Therefore, it could be reflected in intent formation. However, it could also be argued that the actual disclosure behavior might also be influenced by perceived benefits. If this is the case, then control of this factor is necessary in the study. Care is taken to minimize the impact of benefits in the experimental design and site selection. However, since WebMD has an advisory function, a primary benefit of using the site is the usefulness of the information the site provides [25]. To measure benefits, items from TAM were adapted to measure the perceived usefulness of WebMD. Since the focus of the study is to determine the effects of the reciprocal relationship, we use benefits as a control variable and parse out their effects on actual disclosure.

3.4. Information items

The research team developed a list of fifteen items to simulate items that the target Web site would reasonably ask someone who is registering with the Web site. Further, the information items need to be solicited in an order that moves from less intimate to more intimate types of information [5,17,26]. A panel of doctoral students outside the research team evaluated the items on their range of intimacy. These items were then sent to twelve other doctoral students and faculty, again outside the research team, who ranked each item from one (least intimate) to 15 (most intimate). The raters were told to rank these according to how sensitive a particular piece of information was based on if WebMD.com had requested the information, and that there could be no ties in their rankings.

Once the outside raters had completed their rankings, the research team averaged the rankings to determine the final order of presentation. The independent raters' measurements of intimacy were identical across all raters for the extremes of the fifteen items. While items in the middle displayed a little more variation, they were minimal.

Table 2
Descriptive statistics for study constructs.

	Mean	S.D.	(1)	(2)	(3)
Intent (1)	4.08	2.19			
Privacy (2)	4.38	0.84	−0.0860		
Trust (3)	4.99	0.91	0.1315	−0.0540	
Benefits (4)	5.14	1.23	0.1744	−0.1353	0.5142

We calculated Cohen's Kappa for these ranks and the result was 0.83 which shows good agreement [34]. All variations in ratings were within two ranks of each other. This was taken as evidence that the order was stable and that the items escalate in intimacy in an order that would not cause a break down in the reciprocity process. Severe violations, would break down the reciprocity effect we are trying to elicit [8,21,84].

3.5. Measures

The fifteen discrete pieces of information were used to assess intent to disclose. A single item for each piece of information was used for a total of fifteen items. The items were on a seven point Likert scale with “not at all” and “definitely” as the anchors. A single item measure is appropriate when the construct to be measured is narrow and unambiguous to the respondent [85]. The intention items clearly indicated the type of information to be disclosed and the name of the Web site being disclose to instead of asking for general intention to disclose information. Actual disclosure was operationalized as a dichotomous decision. If a participant answered the question, a “1” was recorded; otherwise a “0” was recorded. Responses were validated when appropriate to insure that respondents did not provide false information. For example, if a social security number had less than 9 digits, it was stored as a zero. As part of the instructions participants received, they were told that leaving an item blank is acceptable and they would have the same benefits with regards to site access as someone who did provide the information. Three conditions were developed. The first is the traditional method of requesting for information. Here, no attempt is made to build any sort of relationship; though the information is requested in the same order as it is in the reciprocity conditions. The piece of information is simply requested directly. The second condition uses reciprocity to build a dyadic relationship. This condition matched closely with how reciprocity has historically been used. Prior work has ignored *why* a certain piece of information was requested. The third condition incorporates reciprocity along with why the information is being requested. Appendix A contains the wording of the questions and the requests for information for all three conditions in the order the questions were asked.

Inherent in this experiment are order effects. The principal of reciprocity posits that queries for information need to follow the flow of a normal conversation, starting with innocuous general things and moving to more invasive items as the relationship develops. Prior work has demonstrated that a reciprocal relationship can be established in fifteen items [69]. Further, people in general do not respond to lengthy surveys, or participation drops off due to factors other than the information is too sensitive which further supports the fifteen item limit. People who have purchased items online in the past generally have to provide about fifteen discrete pieces of information to complete the transaction, so prior work, human inclination, and habit all support the fifteen item limit [69,80]. To determine the final order of presentation, the items ranking score was averaged across all raters and then put in numerical order ranging from lowest (least intimate) to highest (most intimate). The ranked order was then reviewed to make sure it flowed like a conversation by the research team.

From the outset, theory dictates that order effects are apparent and should be expected [5,17,69]. Care was taken to arrange the items in

an order that would maximize the likelihood of disclosing the most number of items. While most experiments that anticipate order effects use some sort of design to account for those effects, we do not due to the nature of the dyadic relationship itself being dependent upon the careful arrangement of items.

Other constructs were measured using scales from the literature. To measure trust we used the 11 items to measure trusting beliefs [65]. Trusting beliefs are comprised of benevolence, integrity and competence dimensions. To measure privacy we used 6 items from a global information privacy scale [62]. To measure the perceived benefits of the site, we adapted 4 items from the perceived usefulness scale of the technology acceptance model [25].

3.6. Pilot study

Before the experiment was conducted, we ran a pilot study with 30 individuals. These people were selected at random from the subject population. A member of the research team directed them to the survey Web site where they were instructed to ask any questions or provide any comments about the study. The pilot test accomplished three things. First, we wanted to be certain that the experiment could be completed within 15 min. Subjects are hesitant to participate in a research project when it takes longer than this [27]. Second, we wanted to ensure that certain questions made sense as elicited within the experimental setting. And third, we wanted to observe that the dyadic conditions were being established as expected.

The results of the pilot test demonstrated that the experiment could be completed within time limits. Further, none of the pilot test subjects had issues or problems with the items or item wordings. To evaluate if the dyadic relationship was being established, post-hoc interviews were conducted with all participants. A typical comment from participants in the dyadic condition was, “It [the dyadic condition] made me feel like the company cared about me and my information.” From this the pilot study was considered successful and the experiment was opened up to all participants.

3.7. Procedures

In the typical e-commerce setting, an individual knows a priori that certain pieces of personally identifiable information such as name, address, and credit card number are required in order to complete the transaction and are unavoidable. For the purposes of this research, money is not exchanged, and disclosure is voluntary. The organization is free to ask for any sort of information. Because the individual cannot rely on preconceived notions of what will be asked, intent to disclose is less well formulated and the link between intent and actual behavior would be less stable. We propose that the dyadic relationship can influence this link. Conversely the organization is reliant on the consumer to provide their information because there is no immediate benefit for disclosing information, again suggesting that the intent to behavior link might not be as stable as it might be in other situations.

All subjects proceeded through the same steps in the experiment as shown in Fig. 3. After agreeing to participate, subjects were sent a link to the experiment site. There they completed the general privacy scale and were then directed to WebMD to form an opinion about the site.

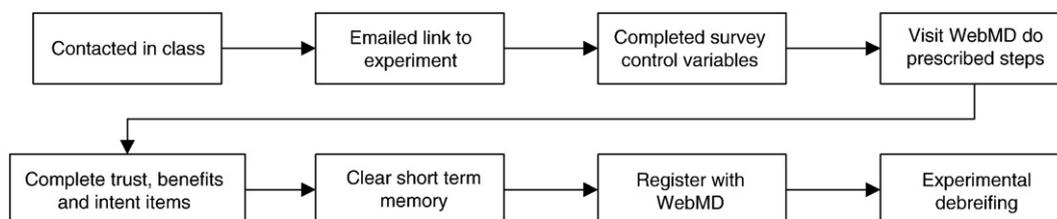


Fig. 3. Experimental steps.

Subjects were given explicit instruction and had to complete several tasks. They searched for information, read several health articles and were encouraged to randomly browse the site once they had completed the prescribed tasks. After completing the prescribed steps and any additional browsing they chose to do subjects then completed the trust, benefits and intent items.

After these items were assessed, all participants completed ten simple math problems. Since short term memory contains approximately 7 ± 2 pieces of information, this allowed the subject's short term memory to be cleared before they were asked to disclose information [13,67]. This step was included to prevent subjects from having thoughts such as, "I just said my intentions to disclose my name was a 7, I better disclose my name." This step was included to minimize any cognitive dissonance a subject might have felt by saying they highly intended to disclose a piece of information and then they choosing not to when the time came. The goal was not to have subjects forget their intent, but instead to forget the numeric value they assigned to their intent. Using math problems to clear short term memory has a long tradition in psychological research [76]. Finally, the participants were told they had the opportunity to register with WebMD.com and to complete the information that followed, provided they felt comfortable sharing a piece of information that they would have access to the site regardless of whether they disclosed the information or not. To participants it "appeared" that they were actually disclosing information to WebMD. All data collection was conducted online as to maintain the perception that subjects were disclosing to a real website.

According to TRA, if the behavior is not under the participant's volitional control then intent is not as effective in predicting behavior [33]. It is crucial to this study that participants feel their behavior is completely voluntary. Participants were told that they were free to disclose whatever information they felt comfortable with. Since the benefits of disclosing information (membership within the Web site community) could unduly influence an individual to disclose, participants were clearly told that any and all benefits concerning the site would be available whether they disclosed any information or not.

4. Results

Analyzing the data presented certain challenges as we had a multi-level model with a dichotomous outcome variable. For further details about multi-level logistic models the reader is directed toward the following resources [3,10,19,58,86,96,107,108]. We used logistic modeling to analyze the dichotomous outcome variable, and we had to use a technique that addressed the repeated and nested nature of the data. To analyze the data, we used the GLIMMIX procedure in SAS 9.13.

Prior to hypothesis testing, the data was analyzed to check for mean differences in intent between the dyadic conditions. If the groups differ on intent, then differences in disclosure would be suspect due to groups having different levels of intent before they even experienced the treatment conditions. Analyzing this as a mixed model yielded no mean differences in intent among the three dyadic conditions $F_{(2, 3304)} = 0.80, p = 0.4512$.

4.1. Hypothesis testing

Descriptive statistics and construct correlations are shown in Table 2. Hypothesis H1 predicts a positive relationship between trust and intent. Hypothesis H2 predicts a negative relationship between privacy and intent. Both trust and privacy are at the website X individual unit of analysis. Intent is at the website X individual X information unit of analysis so to address correlated error terms we analyzed this hypothesis using a multi-level technique. Both hypotheses are supported in the expected direction and the results are shown in Table 3. Intentions to disclose increase the more an indi-

Table 3
Regression results for Hypotheses H1 and H2.

	β	SE_{β}	t	p
Constant	4.08	0.07	–	–
Trust	0.31	0.07	4.20	<0.0001
Privacy	–0.21	0.08	–2.61	0.0091
Pseudo R^2	0.08			
N	3304			

vidual trusts the site conversely as privacy concerns increase intentions are diminished.

The baseline hypothesis posits that intent will be positively related to actual behavior after controlling for benefits, privacy and trust. This follows from TRA, and was tested by running a logistic mixed model. The results were significant ($F_{(1, 3295)} = 37.54, p < 0.0001$) indicating that the baseline hypothesis (H3) is supported.

Since we distinguish between the order of information items, with early items being less intimate, we tested whether early and late order effects (as a third factor) differentially impacts this relationship. A three way interaction (controlling for benefits, privacy and trust) between intent, dyadic condition, and order effects was significant $F_{(2, 3295)} = 3.92, p = 0.0199$. This justifies the splitting of the data into early and later disclosure. An early disclosure item was one of the first eight items, while late disclosure items were among the final seven items. As can be seen in Table 4 the rates of disclosure across the early and late items differ greatly. The data was split into early items and later items and reanalyzed. Again, the intent to actual relationship is clearly supported when information is requested early in the disclosure process ($F_{(1, 1643)} = 77.14, p < 0.0001$) or later in the disclosure process ($F_{(1, 1413)} = 327.70, p < 0.0001$). The effect of intent at initial disclosure exchanges was in the expected direction ($\beta = 0.79$), as was the effect of intent at latter stages in the disclosure process ($\beta = 0.64$). The relationship between intent and actual disclosure is positive and significant indicating robust support for the baseline hypothesis.

To investigate the relationship between intent and dyadic condition, another mixed level logistic regression was conducted. Early in the disclosure process, the interaction between intent and dyadic condition is not significant ($F_{(2, 1649)} = 2.76, p = 0.0633$). Furthermore, there is no difference between dyadic conditions ($F_{(2, 1649)} = 2.17, p = 0.1146$). This indicates that the dyadic relationship has not been established to the point where it would have an effect on disclosure. This is understandable, since prior work has demonstrated that it takes approximately fifteen exchanges to establish a reciprocal relationship [69].

Once the number of exchanges increases to the point that the dyadic relationship has had time to be established, we see an interaction between intent and dyadic condition, ($F_{(2, 1413)} = 3.48, p = 0.0311$) which indicates that the probability of disclosure depends on the dyadic condition and an individual's intention to disclose. Further we also see a significant effect for the dyadic condition ($F_{(2, 1413)} = 3.97, p = 0.0190$).

To test H4a, the reasoned dyadic condition was removed and the interaction between intent and the unreasoned dyadic condition was tested using only the final eight pieces of information. The interaction was not significant ($F_{(1, 940)} = 0.08, p = 0.7800$) nor was the main effects for dyadic condition ($F_{(1, 940)} = 0.01, p = 0.9072$) indicating that the unreasoned dyadic condition is not effective in impacting the probability of disclosure in comparison to the baseline condition. The same procedure was used to test H4b except this time the unreasoned

Table 4
Percentage of disclosure across conditions.

Condition	Early (first 8 pieces)	Late (last 7 pieces)
Nondyadic	70%	29%
Unreasoned dyadic	67%	32%
Reasoned dyadic	69%	35%

dyadic condition was removed. This interaction was significant ($F_{(1, 964)} = 4.74, p = 0.0296$) as was the main effect for dyadic condition ($F_{(1, 964)} = 6.25, p = 0.0126$) thereby indicating the condition moderates the intent to actual relationship and a difference between the nondyadic and reasoned dyadic condition exists for the more sensitive pieces of information.

Table 2 shows the means, standard deviations and correlations among the continuous variables while Table 5 presents the results of these analyses. As shown in Table 5, intent to disclose significantly predicted actual disclosure, regardless of dyadic condition. When investigating the slope of intent, the nondyadic and unreasoned dyadic conditions are essentially equivalent, while the reasoned dyadic is noticeably greater. This indicates that as intent is increasing, the probability of disclosure is increasing faster than it is for the other two conditions. To demonstrate the differences between conditions, the predicted values for each condition are calculated and plotted. By converting the predicted values into the probability form, they can be plotted and easily interpreted, and the differences between conditions easily seen. There is no traditional R^2 measure as in OLS regression. Instead a pseudo R^2 was calculated where the increase in the fit of the full model was compared to an intercept only model [19].

Fig. 4 shows the predicted probability plot. The solid lines are the predicted values, and a 95% confidence interval around each predicted line was also plotted as shown by the dashed lines. Where the confidence intervals overlap, the dyadic conditions can be considered equivalent, whereas where there is no overlap, there is a significant difference between conditions. Across all levels of intent, the UD and ND conditions are equivalent since the confidence intervals for each curve overlap. The plot for the RD is particularly interesting which initially has a lower probability of disclosure, but then as intent increases, it becomes equivalent to the other two, and when intent is high, it has a significantly higher probability of disclosure. This is indicative that the RD has the strongest moderation effect, thereby supporting Hypothesis 4c.

Lastly instead of looking at the graphs in terms of the probability of disclosing as intent increases we can look at the probability of disclosure as the sensitivity of the information requested increases. It is a given that the likelihood of an individual disclosing their credit card number will be less than the likelihood of disclosing their gender so all three curves in Fig. 5 will have a negative slope. These curves demonstrate that across all conditions the likelihood of disclosure diminishes, but it diminishes less for the reasoned dyadic condition. The likelihood of disclosure in the nondyadic condition for the most sensitive piece of information is 0.55 while the probability of disclosure in the reasoned dyadic condition for the same piece of information is 0.71 which means an individual is 16% more likely to disclose in the reasoned dyadic condition.

5. Discussion

This paper addresses how the probability of disclosing information can be improved in voluntary settings. The study draws upon the

Table 5
Regression results for final 8 pieces of information.

	Nondyadic		Unreasoned dyadic		Reasoned dyadic	
	β	SE_{β}	β	SE_{β}	β	SE_{β}
Constant	-2.77	0.12	-3.16	1.17	-3.07	1.1
Intent	0.59	0.07	0.63	0.06	0.78	0.07
Benefits	-0.38	0.1	-0.01	0.14	0.13	0.14
Trust	0.52	0.23	0.25	0.19	0.35	0.23
Privacy	0.01	0.14	0.44	0.19	0.06	0.15
F	89.98*		93.02*		113.43*	
Pseudo R^2	0.452		0.373		0.509	
N	560		511		546	

Values flagged with * are significant at $p < 0.0001$.

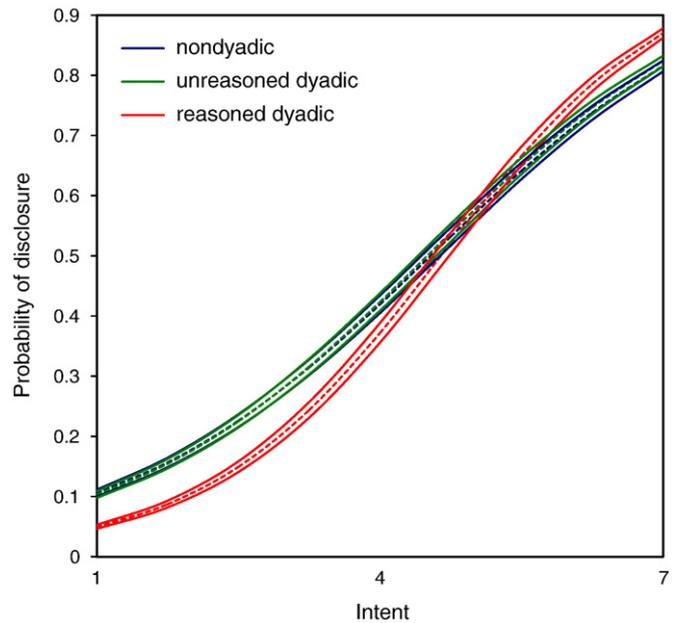


Fig. 4. Probability plot of the three experimental conditions.

theory of reasoned action and social response theory and proposes that disclosure should flow bi-directionally instead of solely from individual to the organization.

5.1. Key findings and insights

Consistent with TRA, the results demonstrated a strong positive link between disclosure intent and disclosure behavior. More interestingly, the proposed interaction between intent and a dyadic condition was also supported. Individuals who had a high intent to disclose were much more likely to actually disclose information when exposed to the reasoned dyadic condition. Since there were no differences between dyadic conditions based on intent, the fact that predicted disclosure is significantly higher for high levels of intent in the reasoned dyadic condition (see Fig. 4) is viewed as evidence that the reasoned dyadic condition is minimizing nondisclosure when intention to disclose was high. Unfortunately, the data also shows that the reasoned dyadic condition did not increase the incidence of

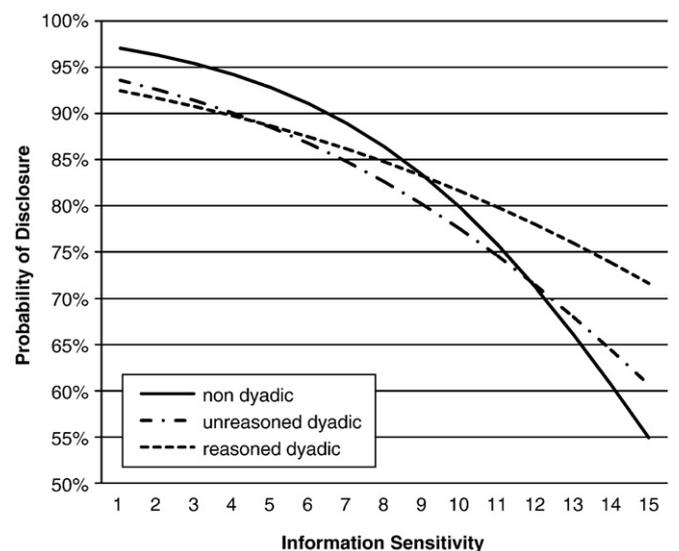


Fig. 5. Likelihood of disclosure as sensitivity increases.

disclosure when intention to disclose was low. What we observe from the data is that the probability of disclosure increases at a higher rate as the intention to disclose increases for the reasoned dyadic over the other two conditions.

The concept of para-social presence helps explain these results [55]. The relationship between an individual and the Web site can be characterized in much the same way as traditional inter-personal relationships. The reasoned dyadic condition created a pleasant experience for the individual. It simulated politeness, reciprocity, and provided reasoning for the data collection. In doing so, it closed the distance between the social actors (Web site and individual), gradually following the rules of conversation. The results demonstrate that this condition was effective in increasing the probability of disclosure.

5.2. Implications for research and practice

This study offers several avenues for future research. Instead of viewing presence in terms of richness [15,16], the social actor view needs to be further investigated. Incorporating the strength of the para-social presence into the disclosure model would be a logical extension. Where this study leveraged para-social presence to create the dyadic conditions in a completely textual manner, future work can utilize other media including human simulations (avatars) to enrich the users' involvement in the relationship. As web technologies mature, richer media can be implemented in a cost effective manner [78,79].

Prior research has demonstrated that individuals will disclose more sensitive information in an online setting than a paper based setting regardless of how the information is requested [41]. This tendency combined with the findings in support of the theory of social response forms a powerful technique an organization can use to encourage disclosure. These findings have direct implications to how information collection systems are developed. When more intimate information is needed, is building a dyadic relationship worth the effort it takes in developing that new system? This research suggests that this might be the case, but further research is needed to examine the trade-offs and effectiveness of such investments for various points on the intent curve.

The reasoned dyadic condition can function as a central path to attitude change according to the Elaboration Likelihood Model [77]. By sharing *why* the information is needed the organization can get individuals to change their attitude about disclosing information. In our study intent was formed prior to exposure to the reasoned dyadic condition, but if an individual were to return to the site disclosure might increase. This would require a longitudinal design and is another avenue for future work.

Lastly, this study focused on the impact of disclosing more intimate information. While privacy has a long history in IS research [24,29,93], the intimacy, or sensitivity, of a particular piece of information has been largely ignored. Perhaps one of the reasons sensitivity is understudied in IS research is in the difficulty in the conceptualization of the construct. Sensitivity is a separate and distinct construct from privacy [68,83,100]. While privacy concerns can influence an individual's intentions to disclose [24,62,93], the effects of sensitivity are seen once the disclosure process has begun. There are opportunities for future research to further develop dimensions of sensitivity and map them into the nomological network surrounding information disclosure. Testing relationships under various settings can yield insight into boundary conditions for dyadic conditions with respect to information sensitivity and context.

Lastly, this study investigated purely voluntary disclosure, which is atypical in today's online world. When the organization offers benefits to disclosure, will the dyadic relationship still be effective? Can benefits be offered to work synergistically with feelings of reciprocity? These again provide fertile ground for future investigation.

In designing systems for information collection, managers need to be mindful of exactly what type of information they need. In general,

incidence of disclosure decreases as the questions get more intimate. Organizations need to carefully determine what is required and take steps to make sure that more intimate pieces of information are requested through a process of building a dyadic relationship. By requesting more intimate information later in the process, it allows for the dyadic relationship to develop. As shown in Fig. 4, building a dyadic relationship has its greatest benefit for people who already have a higher intent to disclose. In reality most of the individuals who voluntarily disclose information would be those with high levels of intent – and dyadic conditioning can further facilitate disclosure.

We would caution that a dyadic relationship is not a magic bullet that will solve an organization's information needs. Individuals need to want to disclose or intend to disclose. Our results show that when intent is low, people will have low probability of disclosure. A reciprocal relationship could be established, though this is no more effective than not building a dyadic relationship. Curiously, when intent is low, individuals in the reasoned dyadic condition are significantly less likely to disclose. The probability of disclosure behavior will also increase at a higher rate for reasoned dyadic than the other conditions. This suggests that it might help individuals who are uncertain about their intention disclose. The results also suggest that when individuals have their minds set about not disclosing, manipulation is unlikely to convince them otherwise and investments in such systems may not be fruitful.

Intent formation was not explicitly studied – but is a critical antecedent to disclosure. Organizations should work to impact beliefs and attitudes toward disclosure by building trust, and alleviating privacy concerns [62,93]. Organizations use methods such as privacy statements to help alleviate customer concerns and build trust. Traditionally, these statements are placed in a separate section on the organization's Web site. By implementing systems that form dyadic relationships, it might be useful to address customer concerns as part of the collection process itself.

Recent studies in electronic commerce demonstrate that the low social presence of online environments may be problematic [43,75]. These studies see social presence as concerned with “warmth”, where a medium conveys a feeling of human contact, sociability, and sensitivity. Looking at social presence from this perspective, most online stores exhibit little emotional or social appeal compared to offline shopping environments, which encompass a wide range of emotions involving social interactions between humans through multiple sensory channels [43]. Web sites can infuse human warmth and sociability by providing services such as personalization and rich interaction to increase shopping behavior and customer loyalty. The results of this study suggest that enhancing social presence can also positively affect information disclosure process. Creating a reciprocal relationship in which the Web site acts as a social actor and shares information with individuals increases the social presence of the Web site. This in turn helps individuals build trust through the perception that the Web site is displaying a sense of personal, sociable, and sensitive human contact [75], leading to higher probability of disclosure behavior.

Overall, building relationships with the consumer will be beneficial for the organization. The key to e-commerce is repeated interactions, and while the focus of this study is on non-monetary settings, the implication is that by building the relationship with the consumer, eventually there will be a financial transaction between the organization and the individual.

5.3. Study limitations

This study contains some noteworthy limitations that also provide opportunities for future research. First, we used a real website (WebMD) as our target in the experiment. One drawback to using an established site is that we needed to have reasonable assurance that there was limited prior exposure to the website as that might influence intention formation. The age range of our sample is from 19 to 22 years

old, and informal interviews with potential subjects during the pilot and actual study indicated that all had heard of WebMD, but that they had not visited the site. Further assurance was provided through Nielsen Net Media which reports that the typical WebMD user is over 40, hence our sample is not likely to frequent WebMD [6,7]. Therefore, while we did not formally control for prior WebMD exposure is a limitation, we do not believe that it unduly impacted our results. A second limitation is (it can be argued) that intent is formed iteratively across the disclosure process as the shared social history develops. This study took place over the course of about 15 min so intent should not change significantly. Further it would disrupt the dyadic condition to collect intent prior to each request for information, and collecting intent pre and post manipulation does not make theoretical sense in that the individual has already disclosed the information. Unless something about the respondent changes (a highly unlikely scenario in a 15 minute time frame) the intentions to subsequently disclose are not of concern. Furthermore we are interested in the effects of the dyadic conditions not subsequent information disclosure.

We selected fifteen pieces of information that a Web site might legitimately ask if someone were registering with the site. The items were based on common sense, and are assumed to cover a wide range of information. However, these items are not a definitive list of what organizations should ask to elicit disclosure. Every organization's information needs differ and this might affect the generalizability of our findings – even though medical information reflects higher levels of intimacy. Since more invasive information equates to a lower probability of disclosure, then when a relationship is developed with less invasive information (e.g., non medical site), then arguably the results should be even better than what we observed.

Our initial foray into using reciprocal relationships for eliciting greater disclosure offers some interesting opportunities for future work

as well. As with any cross sectional design, we were unable to investigate how the relationship impacted subsequent visits to the site. Do the feelings of reciprocity last or is every visit akin to a first time visit where the dyadic relationship will have to be re-established. Other work could investigate how the establishment of the dyadic relationship impact subsequent beliefs and attitudes toward disclosure.

6. Conclusion

With the economics of customization changing, organizations need customer information as a critical input to their product and service development processes. Despite the greater need, consumers realize the benefit of their personal information and are ever more reluctant to freely disclose. By capitalizing on an individual's inherent tendency to socially orient themselves toward another, this study demonstrates that intimate information can be effectively solicited by organizations. People are biologically wired to respond in kind to polite social advances provided those advances follow socially acceptable guidelines.

We tread new ground by studying the oft assumed relationship between intent and actual disclosure decision behavior. We show that building a dyadic relationship is an effective way for organizations to collect what is needed. However, it is important to note that these elicitation processes must be conducted within the context of a socially responsible organization that respects individual privacy and privacy laws. We see these dyadic processes for information solicitation as a catalyst and part of a broader approach to building relationships with customers in an increasingly digital environment. We hope that this study will spawn further investigations into relationships between intention, disclosure behavior, and social relationships through information technology.

Appendix A. Question wording to form the dyadic relationships

Reasoned dyadic condition	Unreasoned dyadic condition	No dyadic condition
WebMD collects gender information since many medical issues are gender specific.	WebMD is a company that is 51% female	The first question concerns gender.
<i>What is your gender?</i> As we age certain health issues become more common. Our website contains information about many medical conditions that become more common as people age.	WebMD was "born" in 1996. We've been online for 9 years.	Next is a question about your birthday
<i>When is your birthday?</i> We personalize our website for our users. What is your full name? We offer daily health newsletters to our users.	Our CEO is Kevin Cameron We can be contacted at jmeyer@webmd.com	The next question concerns your name Now we are going to ask you about your e-mail address
<i>What is your e-mail address?</i> We offer several free online courses. To tailor the course content to our users	All of our message boards are monitored by real physicians who all have eight years of medical school.	Next is a question about your education level
<i>What is the highest grade you have completed?</i> To better understand work related health issues	WebMD employs over 5000 people in all types of positions	Now we are going to ask you a question about your job
<i>What is your profession?</i> To better understand weight related health issues	The probability of certain types of medical conditions increases with increasing weight	The next question is about your weight
<i>How much do you weigh?</i> Certain areas of the country are more prone to certain health conditions due to environmental factors such as long winters.	Our main offices are in Elmwood Park, NJ but we have many other offices around the country	Up next is a question about where you live
<i>What is your postal address?</i> We collect demographic information to understand our customers better	Our stock price has ranged between \$6.50 and \$10.00 in the last year	Now we are going to ask about your income
<i>What is your annual income?</i> The probability of certain types of medical conditions increases if others in your family also have them.	At WebMD, many of our employees have family members with high blood pressure.	The next question deals with family health issues

Appendix A (continued)

Reasoned dyadic condition	Unreasoned dyadic condition	No dyadic condition
<i>Which of the following health conditions run in your immediate family?</i>		
We have been hired by several health insurance providers to see if their clients are WebMD users	The health benefits we provide are through Blue Cross/Blue Shield	Now we are going to ask about your insurance provider
<i>What company provides your health insurance?</i>		
The website provides information about what to expect if you enroll in a clinical trial	Several of our WebMD employees have participated in clinical research trials	The next question is about being in a clinical trial
<i>Are you interested in participating in a clinical research trial?</i>		
For optimal health, people should see a general practitioner at least once a year.	Over 90% of our employees see a general practitioner at least once a year	Next is a question about when you have seen a doctor
<i>How long has it been since you have seen a doctor?</i>		
Portions of the website have content that users need to be over 18 to access. For age verification purposes.	WebMD has a revolving line of credit with CitiBank for day to day operating expenses	The next question is about your credit card
<i>What is your credit card number?</i>		
WebMD can access health records of its customers which improves the diagnostic information about our customers.	Our Employer Identification Number is 45-8237591	The final question is about your social security number
<i>What is your social security number?</i>		

References

- Abraham, P. Sheeran, Acting on intentions: the role of anticipated regret, *British Journal of Social Psychology* 42 (2003) 495–511.
- Adomavicus, A. Tuzhilin, Personalization technologies: a process-oriented perspective, *Communications of the ACM* 48 (10) (2005) 83–90.
- L.S. Aiken, S.G. West, *Multiple Regression: Testing and Interpreting Interactions*, Sage, Thousand Oaks, CA, 1991.
- I. Ajzen, M. Fishbein, *Understanding Attitudes and Predicting Social Behavior*, Prentice-Hall, Englewood Cliffs, NJ, 1980.
- I. Altman, D.A. Taylor, *Social Penetration: The Development of Interpersonal Relationships*, Holt, Rinehart & Winston, New York, NY, 1973.
- Pew Internet's WWW User Survey Retrieved Nov. 30, 2005, from: <http://www.pewinternet.org/trends/demographicsofInternetUsers.htm>, 2005.
- WebMD website traffic. Retrieved Mar. 23, 2008, from: <http://www.nielsen-netratings.com/>, 2007.
- R.L. Archer, Role of personality and the social situation, in: G.J. Chelune (Ed.), *Self-Disclosure: Origins, Patterns and Implications of Openness in Interpersonal Relationships*, Jossey-Bass, San Francisco, 1979, pp. 28–58.
- C.J. Armitage, M. Conner, Efficacy of the theory of planned behavior: a meta-analytic review, *British Journal of Social Psychology* 40 (4) (2001) 471–499.
- G.A. Ballinger, Using generalized estimating equations for longitudinal data analysis, *Organizational Research Methods* 7 (2) (2004) 127–150.
- Y. Bart, V. Shankar, F. Sultan, G.L. Urban, Are the drivers and role of online trust the same for all web sites and consumers? A large-scale exploratory empirical study, *Journal of Marketing* 69 (4) (2005) 133–152.
- B. Berendt, O. Günther, S. Spiekermann, Privacy in e-commerce: stated preferences vs. actual behavior, *Communications of the ACM* 48 (4) (2005) 101–106.
- R. Brener, An experimental investigation of memory span, *Journal of Experimental Psychology* 26 (1940) 467–482.
- O.B. Büttner, A.S. Göritz, Perceived trustworthiness of online shops, *Journal of Consumer Behaviour* 7 (1) (2008) 35–50.
- K. Burke, L. Chidambaram, How much bandwidth is enough? A longitudinal examination of media characteristics and group outcomes, *MIS Quarterly* 23 (4) (1999) 557–580.
- P.J. Carlson, G.B. Davis, An investigation of media selection among directors and managers: from "self" to "other" orientation, *MIS Quarterly* 22 (3) (1998) 335–362.
- A.L. Chaikin, V.J. Derlega, Variables affecting the appropriateness of self-disclosure, *Journal of Consulting and Clinical Psychology* 42 (1974) 588–593.
- R.B. Cialdini, *Influence: Science and Practice*, HarperCollins, New York, NY, 1993.
- J. Cohen, P. Cohen, S.G. West, L.S. Aiken, *Applied Multiple Regression/Correlation for the Behavioral Sciences*, 3rd ed. Lawrence Erlbaum Associates, Mahwah, NJ, 2003.
- N.B. Cohn, D.S. Strassberg, Self-disclosure reciprocity among preadolescents, *Personality and Social Psychology Bulletin* 9 (1) (1983) 97–102.
- N.L. Collins, L.C. Miller, Self-disclosure and liking: a meta-analytic review, *Psychological Bulletin* 116 (3) (1994) 457–475.
- C.L. Corritore, B. Kracher, S. Wiedenbeck, On-line trust: concepts, evolving themes, a model, *International Journal of Human-Computer Studies* 58 (6) (2003) 737–758.
- P.C. Cozby, Self-disclosure: a literature review, *Psychological Bulletin* 79 (1973) 73–91.
- M.J. Culnan, "How did they get my name?": an exploratory investigation of consumer attitudes toward secondary information use, *MIS Quarterly* 17 (3) (1993) 341–363.
- F.D. Davis, Perceived usefulness, perceived ease of use, and user acceptance of information technology, *MIS Quarterly* 13 (3) (1989) 319–340.
- V.J. Derlega, J. Grzelak, in: G.J. Chelune (Ed.), *Self-Disclosure: Origins, Patterns and Implications of Openness in Interpersonal Relationships*, Jossey-Bass, San Francisco, 1979, pp. 151–176.
- D.A. Dillman, *Mail and Internet Surveys: The Tailored Design Method*, John Wiley and Sons, Inc., New York, 2000.
- T. Dinev, P. Hart, Internet privacy concerns and social awareness as determinants of intention to transact, *International Journal of Electronic Commerce* 10 (2) (2005) 7–29.
- T. Dinev, P. Hart, An extended privacy calculus model for e-commerce transactions, *Information Systems Research* 17 (1) (2006) 61–80.
- T. Dinev, P. Hart, Internet privacy concerns and beliefs about government surveillance – an empirical investigation, *Journal of Strategic Information Systems* 17 (3) (2008) 214–233.
- A.H. Eagley, S. Chaiken, *The Psychology of Attitudes*, Harcourt, Brace & Jovanovich, Fort Worth, TX, 1993.
- C.C. Eckel, R.K. Wilson, Is trust a risky decision? *Journal of Economic Behavior & Organization* 55 (4) (2004) 447–465.
- M. Fishbein, I. Ajzen, *Belief, Attitude, Intention, and Behavior: An Introduction to Theory and Research*, Addison-Wesley, Reading, MA, 1975.
- J.L. Fleiss, *Statistical Methods for Rates and Proportions*, Vol. 2nd, Wiley & Sons, New York, NY, 1983.
- B. Friedman, P.H.J. Kahn, D.C. Howe, Trust online, *Communications of the ACM* 43 (12) (2000) 34–40.
- D. Gefen, D.W. Straub, E-commerce: the role of familiarity and trust, *Omega: The International Journal of Management Science* 28 (6) (2000) 725–737.
- D. Gefen, D.W. Straub, Consumer trust in B2C e-commerce and the importance of social presence: experiments in e-products and e-services, *Omega: The International Journal of Management Science* 32 (6) (2004) 407–424.
- D. Gefen, E. Karahanna, D.W. Straub, Trust and TAM in online shopping: an integrated model, *MIS Quarterly* 27 (1) (2003) 51–90.
- M.E. Gordon, L.A. Slade, N. Schmitt, The "science of the sophomore" revisited: from conjecture to empiricism, *Academy of Management Review* 11 (1) (1986) 191–207.
- J.I. Hagel, J.F. Rayport, The coming battle for customer information, *Harvard Business Review* 75 (1) (1997) 53–65.
- R.C. Hanna, B. Weinberg, R.P. Dant, P.D. Berger, Do internet-based surveys increase personal self-disclosure? *Database Marketing & Customer Strategy Management* 12 (3) (2005) 342–356.
- S. Harridge-March, Can the building of trust overcome consumer perceived risk online? *Marketing Intelligence & Planning* 24 (7) (2006) 746–761.
- K. Hassanein, M. Head, The impact of infusing social presence in the web interface: an investigation across product types, *International Journal of Electronic Commerce* 10 (2) (2005) 31–55.
- C.T. Hill, D.E. Stull, Disclosure reciprocity: conceptual and measurement issues, *Social Psychology Quarterly* 45 (4) (1982) 238–244.
- D.L. Hoffman, T.P. Novak, M. Peralta, Building consumer trust online, *Communications of the ACM* 42 (4) (1999) 80–85.
- M. Horst, M.t. Kuttischreuter, J.M. Gutteling, Perceived usefulness, personal experiences, risk perception and trust as determinants of adoption of e-government services in The Netherlands, *Computers in Human Behavior* 23 (4) (2007) 1838–1852.
- D. Horton, R.R. Wohl, Mass communication and para-social interaction: observations on intimacy at a distance, *Psychiatry* 19 (3) (1956) 215–229.
- K.L. Hui, H.H. Teo, T.S.Y. Lee, The value of privacy assurance: an exploratory field experiment, *MIS Quarterly* 31 (1) (2007) 19–33.
- E. Karahanna, D.W. Straub, The psychological origins of perceived usefulness and ease-of-use, *Information & Management* 35 (4) (1999) 237–250.
- D.J. Kim, D.L. Ferrin, H.R. Rao, A trust-based consumer decision-making model in electronic commerce: the role of trust, perceived risk, and their antecedents, *Decision Support Systems* 44 (2) (2008) 544–564.
- S.S. Kim, N.K. Malhotra, Predicting system usage from intention and past use: scale issues in the predictors, *Decision Sciences* 36 (1) (2005) 187–196.
- C.L. Kleinke, Effects of personal evaluations, in: G.J. Chelune (Ed.), *Self-Disclosure: Origins, Patterns and Implications of Openness in Interpersonal Relationships*, Jossey-Bass, San Francisco, CA, 1979, pp. 59–79.
- B. Kogut, U. Zander, Knowledge of the firm and the evolutionary theory of the multinational corporation, *Journal of International Business Studies* 24 (4) (1993) 625–645.

- [54] M. Koufaris, W. Hampton-Sosa, The development of initial trust in an online company by new customers, *Information & Management* 41 (3) (2004) 377–397.
- [55] N. Kumar, I. Benbasat, Para-social presence and communication capabilities of a web site, *e-Service Journal* 1 (3) (2002) 5–24.
- [56] N. Kumar, I. Benbasat, Para-social presence: a re-conceptualization of 'social presence' to capture the relationship between a web site and her visitors, 35th Hawaii International Conference on System Sciences, IEEE Computer Society, Waikoloa, Hawaii, 2002.
- [57] D. Lemish, The rules of viewing television in public places, *Journal of Broadcasting* 26 (4) (1982) 757–781.
- [58] K.-Y. Liang, S.L. Zeger, Longitudinal data analysis using generalized linear models, *Biometrika* 73 (1) (1986) 13–22.
- [59] M. Lombard, Direct responses to people on the screen: television and personal space, *Communication Research* 22 (3) (1995) 288–324.
- [60] M. Lombard, T. Ditton, At the heart of it all: the concept of presence, *Journal of Computer Mediated Communication* 3 (2) (1997) article 4.
- [61] G.S. Lynn, New product team learning: developing and profiting from your knowledge capital, *California Management Review* 40 (4) (1998) 74–93.
- [62] N.K. Malhotra, S.S. Kim, J. Agarwal, Internet Users' Information Privacy Concerns (IUIPC): the construct, the scale, and a causal model, *Information Systems Research* 15 (4) (2004) 336–355.
- [63] R.C. Mayer, J.H. Davis, F.D. Schoorman, An integrative model of organizational trust, *Academy of Management Review* 20 (3) (1995) 709–734.
- [64] D.H. McKnight, N.L. Chervany, What trust means in e-commerce customer relationships: an interdisciplinary conceptual typology, *International Journal of Electronic Commerce* 6 (2) (2002) 35–59.
- [65] D.H. McKnight, V. Choudhury, C. Kacmar, Developing and validating trust measures for e-commerce: an integrative typology, *Information Systems Research* 13 (3) (2002) 334–359.
- [66] H. McKnight, V. Choudhury, C. Kacmar, The impact of initial consumer trust on intentions to transact with a web site: a trust building model, *The Journal of Strategic Information Systems* 11 (3–4) (2002) 297–323.
- [67] G.A. Miller, The magical number seven plus or minus two, *Psychological Review* 63 (1956) 81–97.
- [68] G.R. Milne, M.E. Gordon, Direct mail privacy-efficiency trade-offs within an implied social contract framework, *Journal of Public Policy and Marketing* 12 (2) (1993) 206–215.
- [69] Y. Moon, Intimate exchanges: using computers to elicit self-disclosure from consumers, *Journal of Consumer Research* 26 (4) (2000) 323–339.
- [70] C. Nass, Y. Moon, Machines and mindlessness: social responses to computers, *Journal of Social Issues* 56 (1) (2000) 81–103.
- [71] C. Nass, J. Steur, Voices, boxes and sources of messages: computers and social actors, *Human Communications Research* 19 (4) (1994) 504–527.
- [72] C. Nass, Y. Moon, B.J. Fogg, B. Reeves, D.C. Dryer, Can computer personalities be human personalities? *International Journal of Human-Computer Studies* 43 (2) (1995) 223–239.
- [73] P.A. Pavlou, Consumer acceptance of electronic commerce: integrating trust and risk with the technology acceptance model, *International Journal of Electronic Commerce* 7 (3) (2003) 101–134.
- [74] P.A. Pavlou, M. Fygenson, Understanding and prediction electronic commerce adoption: an extension of the theory of planned behavior, *MIS Quarterly* 30 (1) (2006) 115–143.
- [75] P.A. Pavlou, D. Gefen, Building effective online marketplaces with institution-based trust, *Information Systems Research* 15 (1) (2004) 37–59.
- [76] L.R. Peterson, M.J. Peterson, Short-term retention of individual verbal items, *Journal of Experimental Psychology* 58 (3) (1959) 193–198.
- [77] R.E. Petty, J.T. Cacioppo, Communication and Persuasion: Central and Peripheral Routes to Attitude Change, Springer-Verlag, New York, NY, 1986.
- [78] L. Qiu, I. Benbasat, Online consumer trust and live help interfaces: the effects of text-to-speech voice and three-dimensional avatars, *International Journal of Human-Computer Interaction* 19 (1) (2005) 75–94.
- [79] L. Qiu, I. Benbasat, An investigation into the effects of text-to-speech voice and 3D avatars on the perception of presence and flow of live help in electronic commerce, *ACM Transactions of Computer-Human Interaction* 12 (4) (2005) 329–355.
- [80] B. Reeves, C.I. Nass, *The Media Equation*, CSLI Publications, Stanford, CA, 1996.
- [81] R.E. Rice, D. Case, Electronic message systems in the university: a description of use and utility, *Journal of Communication* 33 (1) (1983) 131–152.
- [82] N.J. Rifon, R. LaRose, S.M. Choi, Your privacy is sealed: effects of web privacy seals on trust and personal disclosures, *The Journal of Consumer Affairs* 39 (2) (2005) 339–362.
- [83] A.J. Rohm, G.R. Milne, Just what the doctor ordered: the role of information sensitivity and trust in reducing medical information privacy concern, *Journal of Business Research* 57 (2004) 1000–1011.
- [84] Z. Rubin, Disclosing oneself to a stranger: reciprocity and its limits, *Journal of Experimental Social Psychology* 11 (3) (1975) 233–260.
- [85] P.R. Sackett, J.R. Larson, Research strategies and tactics in industrial and organizational psychology, in: M.D. Dunnette, L.M. Hough (Eds.), *Handbook of Industrial and Organizational Psychology*, Consulting Psychologists Press, Palo Alto, CA, 1990, pp. 419–489.
- [86] O. Schabenberger, *Introducing the GLIMMIX Procedure for Generalized Linear Mixed Models*, SAS Users Group International (SUGI), Philadelphia, PA, 2005.
- [87] A.E. Schlosser, T.B. White, S.M. Lloyd, Converting web site visitors into buyers: how web site investment increases consumer trusting beliefs and online purchase intentions, *Journal of Marketing* 70 (2) (2006) 133–148.
- [88] D.R. Shaffer, M.M. Tomarelli, When public and private self-foci clash: self-consciousness and self-disclosure reciprocity during the acquaintance process, *Journal of Personality and Social Psychology* 56 (5) (1989) 765–776.
- [89] P. Sheeran, Intention-behavior relations: a conceptual and empirical review, in: W. Stroebe, M. Hewstone (Eds.), *European Review of Social Psychology*, Wiley, Chichester, UK, 2002, pp. 1–36.
- [90] B.H. Sheppard, D.M. Sherman, The grammars of trust: a model and general implications, *Academy of Management Review* 23 (3) (1998) 422–437.
- [91] J. Sherblom, Direction, function, and signature in electronic mail, *Journal of Business Communication* 25 (4) (1988) 39–54.
- [92] B. Simpson, T. McGrimmon, Trust and embedded markets: a multi-method investigation of consumer transactions, *Social Networks* 30 (1) (2008) 1–15.
- [93] H.J. Smith, S.J. Milberg, S.J. Burke, Information privacy: measuring individuals' concerns about organizational practices, *MIS Quarterly* 20 (2) (1996) 167–196.
- [94] J. Song, F. Zahedi, Trust in health infomediaries, *Decision Support Systems* 43 (2) (2007) 390–407.
- [95] S.R. Sutton, Predicting and explaining intentions and behavior: how well are we doing? *Journal of Applied Social Psychology* 28 (1998) 1317–1338.
- [96] B. Tabachnick, L.S. Fidell, *Using Multivariate Statistics* 4th Edition, Allyn & Bacon, Needham Heights, MA, 2001.
- [97] Y.-H. Tan, W. Thoen, Formal aspects of a generic model of trust for electronic commerce, *Decision Support Systems* 33 (3) (2002) 233–246.
- [98] Z. Tang, Y. Hu, M. Smith, Gaining trust through online privacy protection: self-regulation, mandatory standards, or caveat emptor, *Journal of Management Information Systems* 24 (4) (2008) 153–173.
- [99] D.A. Taylor, Motivational bases, in: G.J. Chelune (Ed.), *Self-Disclosure: Origins, Patterns and Implications of Openness in Interpersonal Relationships*, Jossey-Bass, San Francisco, CA, 1979.
- [100] E.D. Thompson, M.L. Kaarst-Brown, Sensitive information: a review and research agenda, *Journal of the American Society for Information Science and Technology* 56 (3) (2005) 245–257.
- [101] J. Turov, M. Hennessy, Internet privacy and institutional trust: insights from a national survey, *New Media & Society* 9 (2) (2007) 300–318.
- [102] J. Vijayan, FTC charges firms over web breaches, *Computerworld* 38 (47) (2004) 1, 16.
- [103] W. Wang, I. Benbasat, Trust in and adoption of online recommendation agents, *Journal of the Association for Information Systems* 6 (3) (2005) 72–101.
- [104] T.L. Webb, P. Sheeran, Does changing behavioral intentions engender behavior change? A meta-analysis of the experimental evidence, *Psychological Bulletin* 132 (2) (2006) 249–268.
- [105] T.B. White, Consumer disclosure and disclosure avoidance: a motivational framework, *Journal of Consumer Psychology* 14 (1&2) (2004) 41–51.
- [106] A.W. Wicker, Attitudes versus actions: the relationship of verbal and overt behavioral responses to attitude objects, *Journal of Social Issues* 25 (1969) 41–78.
- [107] S.L. Zeger, K.-Y. Liang, Longitudinal data analysis for discrete and continuous outcomes, *Biometrics* 42 (1) (1986) 121–130.
- [108] S.L. Zeger, K.-Y. Liang, P.S. Albert, Models for longitudinal data: a generalized estimating equation approach, *Biometrics* 44 (4) (1988) 1049–1060.

J. Christopher Zimmer is a Visiting Assistant Professor at Le Moyne College in Syracuse, NY. His current research interests include information sourcing, knowledge management, and individual differences in information technology (IT). He has presented his research at national and international conferences, and his work has appeared in such journals as the *Journal of Management Information Systems* and *IEEE Transactions on Engineering Management*.

Riza Ergun Arsal is a PhD candidate in the Department of Management at Clemson University. His research interests include individual adoption and use of information technologies, and behavioral issues in online settings. His work has been accepted into journals such as *IEEE Transactions on Engineering Management* and the *Journal of Organizational and End User Computing*. His work has also been presented at conferences such as Americas Conference on Information Systems (AMCIS).

Mohammad Al-Marzouq is an Assistant Professor in the department of Quantitative Methods and Information Systems at Kuwait University. He is a graduate of the Information Systems track of the Management PhD at Clemson University. His research focus is on privacy issues related to technology, project management, and knowledge management. Recently, his research has been targeting the Free/Libre and Open Source phenomenon.

DeWayne Moore is Professor of Psychology at Clemson University. His interests are in quantitative methods, measurement and scale construction, and cognitive aging. He has (co-) authored over 50 articles appearing in such journals as *Educational and Psychological Measurement*, *Journal of Occupational Health Psychology*, *Psychophysiology*, *Journal of Personality*, *Human Learning and Performance*, *Journal of Gerontology*, and *Experimental Aging Research* among others.

Varun Grover is the William S. Lee (Duke Energy) Distinguished Professor of Information Systems at Clemson University. He has published extensively in the information systems field, with over 200 publications in refereed journals. Seven recent articles have ranked him among the top four researchers based on publications in the top six Information Systems journals in the past decade. Dr. Grover is Senior Editor for *MIS Quarterly*, the *Journal of the AIS* and *Database*. He is currently working in the areas of IT value, system politics and process transformation and recently released his third book (with M. Lynne Markus) on process change.