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ABSTRACT

We examine whether psychological contract theory can explain users' responses to e-commerce recommendation agents (RAs). Theories of social response to technology, trust in technology, and technology adoption are used to adapt psychological contract theory from the interpersonal domain to user-RA domain. We theorize that a psychological contract breach will cause a negative emotional reaction, called a psychological contract violation, which, via trust and usefulness perceptions, will influence users' intentions to follow an RAs' recommendation. Two studies elicited perceived user-RA mutual obligations, which form the basis for the posited psychological contract. We outline a Study 3 to measure preference strength for these obligations, and a Study 4 to test the effect of breaching these obligations on theorized emotional, cognitive, and behavioral reactions to the RA. Using these studies, insights can be gained about how to design RAs to achieve important business results and avoid negative side effects.

Keywords

Psychological contracts, recommendation agents, obligations, and online decision making.

INTRODUCTION

Recommendation agents (RAs) are software tools provided on electronic-commerce (e-commerce) websites that attempt to understand individual users' preference function implicitly or explicitly and make product recommendations accordingly (Xiao and Benbasat, 2007). The trade press shows increasing interest in the development of RAs by major web vendors. *The New York Times* reported that online movie rental service, Netflix Inc., announced a $1 million for any person who can improve the accuracy of its movie recommendations (Hafner, 2006). The central motivation in these investments is that "[RAs] hold out the promise of making shopping on the internet better not just by finding lower prices but by matching products to the needs of the customers" (Aggarwal and Vaidyanathan, 2003, p.159). But, use of RAs to provide recommendations is not entirely without risk. Unfulfilled promises by an RA may cause negative consequences not only for the RA but also for the web vendor associated with the RA. For example, Wal-Mart Inc., the world's largest retailer, was forced to permanently remove a movie recommending RA from its website when the RA provided customers with incorrect and offensive recommendations (Flynn, 2006). Moreover, incorrect or misleading recommendations provided by RAs may also result in a class-action lawsuit against the web vendors (Heckman and Wobbrock, 1999). Therefore, understanding the influence of unfulfilled promises would help researchers, as well as practitioners, design more effective RAs and explain when and why users would follow the recommendations of RA.

The purpose of this research is to investigate whether or not psychological contract theory (Rousseau, 1995), which was developed in the human-human context, can serve as a theoretical base to explain the human-recommendation agent relationship. A vast body consumer research as well information systems (IS) research has examined factors that influence consumer decision making in online shopping environments. A consistent finding is that online RAs have the potential to support and improve the quality of decisions consumers make while searching for and selecting products online as well as to reduce the problems associated with information overload and complexity of online searches (Xiao and Benbasat, 2007). It is also well documented that using a decision aid does not always result in improved decision quality and increased effectiveness (e.g., Lilien, Rangaswamy, Van Bruggen and Starke, 2004). However, the negative influence of unmet obligations—i.e., when an RA fails to deliver what it promised—is still largely ignored. There is strong evidence in the management, organizational behavior, and information systems literature that suggests that when psychological contracts between human and agents are not fulfilled, the consequences are very intense as the reaction is not only attributable to the unmet expectations but also to other beliefs such as codes of conduct and respect for the relationships (Koh, Ang and Straub, 2004; Pavlou and Gefen 2005; Rousseau 1995). Therefore, examining why and how unmet obligations would influence consumer decision making in online stores would help us better understand the human-RA relationship.

In the present research, we first use theory of social response (Moon 2000; Reeves and Nass 1996) to explain how and why psychological contract theory, which has been used to explain inter-personal relationships, can also

be used to better understand user-RA relationships. We then present some of the dimensions along which we believe a psychological contract would exist between a user and an RA. Finally, we develop a theoretical model to explain how and why an online consumer's perception that an RA breached their psychological contract would influence their decision making and key beliefs of trust and usefulness.

This research makes three key contributions to theory and practice. First, this research contributes to the IS literature by examining the system-user relationship, in general, and user-RA relationship, in particular, from the psychological contract theory perspective to understand the role of unfulfilled promises. Second, this research builds upon and extends the current RA literature by explaining the influence of unmet obligations on consumer decision making in online stores using the underpinnings of the psychological contract theory. Finally, this research contributes to the RA literature by identifying the underlying mechanisms that may lead to a psychological contract breach.

THEORY

Psychological Contract Theory in User-RA Relationship

Although prior research has studied psychological contracts in inter-personal relationships, we believe that, with appropriate appropriation, the concept can be used to study user-RA relationships. The main idea here is that introduction of many inter-personal constructs to study adoption of technology has called into question the common assumption that technological artifacts are impersonal tools—i.e., they lack any ability for social action (Reeves and Nass, 1996). For example, trust has traditionally been applied primarily in the context of inter-personal relationships. Recently, a rich stream of research has showed that trust between users and technological artifacts help us explain a significant portion of variance in technology adoption decisions (Ba and Pavlou, 2002).

Extant RA literature shows that, unlike generic information technology, the central aim of an RA is to provide personalized advice (Xiao and Benbasat, 2007). Personalized advice is the extent to which the RA understands and represents users' personal needs (Komiak and Benbasat, 2006). This personalization may involve design elements such as designing an RA with a personality similar to the decision-maker's personality (Al-Natour, Benbasat and Cenfetelli, 2008). The overall aim of these e-commerce sites is to personalize RAs so that they present a human face to automated responses (Aggarwal and Vaidyanathan, 2003). According to the theory of social response, humans attribute human like characteristics and social behaviors to technology despite knowing that the technology is not human (Moon, 2000; Reeves and Nass, 1996). This attribution has been explained by mindless behavior that has been observed in a wide variety of social situations. Mindless behavior

occurs as a result of conscious attention to a subset of conscious cues that trigger various scripts based on the past experience. This in turn focuses attention on certain information diverting attention from other, possible relevant, information (Moon, 1996). So, rather than performing behaviors based on the relevant features of the current situations, individuals commit to overly simplistic scripts drawn from the past (Al-Natour et al. 2008). Because, RAs are personalized by the e-commerce websites, when they demonstrate human-like characteristics, users of RA are likely to attribute human-like characteristics and apply social rules to these RAs.

In the context of RA-user relationship, we contend that: (1) users form a relationship with the RA; and (2) this relationship is governed by social rules similar to those that govern social relationships. At the core of any psychological contract is the idea of mutual obligations (Robinson and Morrison, 2000). Next, based on the prior literature, we outline some of the dimensions of this psychological contract in a user-RA relationship.

Psychological Contract with RA

In this research, a psychological contract with an RA is defined as user's-belief about mutual obligations between them and the RA. Prior research has shown that RAs offer a promise of improving the overall shopping experience for their customers (Aggarwal and Vaidyanathan, 2003). RAs make these promises both explicitly (e.g., lowest price by www.pricegrabber.com) and implicitly (e.g., privacy protection by www.yahoo.com). Users believe that the RA would provide them with *accurate and timely information* (Xiao and Benbasat, 2007) so that they can make better product choices with *minimum effort*. Further, users consider RAs to be *altruistic* such that they do not have any vested interest in what users do with the information they provide (e.g., Haubl and Murray, 2006). So, they expect RAs not to act in an opportunistic way, but instead to provide *honest and unbiased* recommendations (e.g., Kramer, 2007). Users also expect RAs to *reduce overall price and product search cost* because the immense product selection often available in online stores makes it almost impossible for users to find the product they desire while respecting their *privacy* concerns. In return, users are obligated to provide *information pertaining to their preferences* (e.g., Haubl and Murray 2006), *attribute levels of their preferences* (Kramer, 2007), and *incur cost* in terms of time spent in waiting for RA to respond in order to receive accurate and effective recommendations. We theorize that because of these mutual obligations in the user-RA relationship, users will develop a psychological contract with an RA.

Hypotheses Development

Trust in an RA is defined as the belief that the RA adheres to a set of principles that user finds acceptable (integrity), cares about the user and acts in his or her interests (benevolence), and has the skills and expertise to perform

effectively (competence, Wang and Benbasat, 2007). Mayer, Davis and Schoorman (1995) argue that both adherence to and acceptability of the principles are required for a trusted agent to be perceived to exhibit integrity. When users perceive a psychological contract breach with an RA, they perceive an inconsistency in what the RA promised and what it actually delivered. As a result, users experience a psychological contract violation, defined as the negative emotional experience resulting from this contract breach, and lose confidence that the RA would adhere to principles that users consider acceptable resulting in a decreased level of trust. Furthermore, in order to exhibit benevolence, the RA is believed to act in the interest of the user rather than the interest of any external entity (e.g., web vendor). If users interact with an RA based on the assumption that the RA would behave in a trustworthy manner, experiences of a psychological contract violation with an RA would force them to consciously question this initial assumption. On the other hand, if users interact with the RA on the assumption that they do not believe that the RA would exhibit trustworthy behavior, a psychological contract violation with RA would confirm their initial belief of low trust.

Further evidence that a psychological contract violation with an RA undermines trust in an RA is available in the automation failure literature. Using cognitive psychology literature, Madhavan, Wiegmann and Lacson (2006) show that information that contradicts individuals' cognitive schemas is likely to be well remembered and play an unduly large role in information processing. When users perceive a psychological contract breach with an RA, they believe that the RA failed to fulfill its obligations of providing honest and effective recommendations. This failure of the RA would cause users to rely more on their own knowledge to make effective decisions and distrust the available RA.

H1: Psychological contract violation with RA will decrease users' trust in RA.

Much prior research in technology acceptance literature has shown that perceived usefulness (e.g., Davis 1989) is one of the most dominant variables in predicting intentions to perform a behavior. Result demonstrability, defined as "tangibility of the results of using innovation" (Moore and Benbasat 1991, p. 203), is known to be a key antecedent of perceived usefulness (Venkatesh and Davis, 2000). If the system fails to produce effective job relevant results, users are likely to have low perceived usefulness of the system (Venkatesh and Davis, 2000. Similarly, Lilien et al. (2004) show that if users of a DSS fail to recognize the intrinsic quality of the DSS or the value of recommendations it generates, they are likely to be less satisfied. Because perceptions of a psychological contract violation with an RA involve user perceptions that the RA is not faithfully fulfilling their obligations of providing effective recommendations, psychological

contract violation is expected to reduce perceived usefulness of RA.

H2: Psychological contract violation with RA will decrease users' perceived usefulness of RA.

When the users perceive a psychological contract breach with RA, they are predicted to experience feelings of injustice and betrayal (Rousseau, 1995). In a user-RA interaction, user has an obligation to expend effort and provide information about the product characteristics and/or preferences while the RA has an obligation to use this information fully to develop effective recommendations. Because users seek to maintain equity between cost and benefits in exchange relationships, with the feelings of injustice and betrayal in case of psychological contract violation (Robinson and Morrison, 2000), they are likely to recoup the costs by reducing their obligations and decreasing their intentions to use RA and accept its recommendations.

H3: Psychological contract violation with RA will decrease users' intentions to purchase recommended products.

According to the technology acceptance literature, more useful technologies are employed more readily (Davis, 1989). Also, the higher the customer's trusting beliefs of an RA, the more likely they are willing to consider following their advice (Wang and Benbasat 2007). Therefore, consistent with prior studies (e.g., Davis, 1989), we hypothesize that:

H4: Trust in RA will increase users' intentions to purchase recommended products.

H5: Perceived usefulness of RA will increase users' intentions to purchase recommended products.

METHOD

In this research, we conducted four studies based on Koh et al. (2004) and Robinson and Morrison (2000). In the first and second studies (results shown), we identified psychological contract obligations in user-RA relationship. In the next two studies (data not available yet), we determined the most important perceived obligations in the user-RA relationship and the effect of unfulfilled obligations on consumer decision making in online environments.

Study 1: Method

We did not have an a-priori list of obligations, because this was, to the best of our knowledge, first study to identify obligations in user-RA relationship or system-user relationship. In this study, interviews were used to identify what are the psychological contract obligations in a user-RA relationship. In this study, we elicited beliefs about mutual obligations involved in psychological contract with RA using open-ended questions. For an initial list of participants, several doctoral and graduate students in two major North American universities were

contacted. The main criterion for selecting interviewees was that they should have at least one year for experience using a recommendation agent such as www.pricegrabber.com or www.mysimon.com.

In total, we interviewed eighteen students. The average age of the interviewees was 29 (S.D. = 2.87). Twenty-one percent were women. The average computer experience was 7.6 years (S.D. = 1.32) and the average experience with RA was 2.3 years (S.D. = 0.43). Following Robinson and Morrison (2000), we probed the interviewees to describe the mutual obligations in their relationship with the RA—i.e., what were the promises that they believe RA has towards them and what were the obligations that interviewees, as the user of RA, have towards the RA. We took extensive field notes at each interview session. These notes were examined in detail for components representing mutual obligations in the user-RA relationship. All the authors then discussed these components and categorized them into major user-RA obligations.

Study 1: Results

Our study 1 interviews identified six user obligations towards RA and nine RA obligations towards user. Examples of perceived user obligations towards RA are: (1) I should provide accurate information regarding the products I need; and (2) I should spend time in providing my product preferences. Example of perceived RA obligations towards user are: (1) RA should find me products that best fit my needs; and (2) RA should find me lowest price for products that best fit my needs

Study 2: Method

In study 2, we surveyed undergraduate students at major North American university. For the initial list of participants we enlisted students from two IS courses. Prior research suggests that individuals' priorities, assumptions about future events, and understanding of the alternatives is influenced by their functional background, prior training, and experiences. Therefore, these courses were selected because students in these courses belong to many different majors and are at different stages of their curriculum. One of the authors showed four different RAs (i.e., AMZON, PRICEGRABBER, MYSIMON, and YAHOO). The choice of these RAs were based on the criterion that all three types of RAs (i.e., collaborative filtering, content filtering, and hybrid filtering) should be presented (Xiao and Benbasat, 2007).

The survey was presented to participants in two steps. First, a survey with open-ended questions was handed out where students were required to indicate mutual obligations in their relationship with the RA—i.e., what were the promises that they believe an RA has towards them and what were the obligations that interviewees, as the user of RA, have towards the RA. Second, participants were asked to indicate the extent to which the RA was obligated to provide a set of items to them. The

first set of instructions read, "Please indicate the extent to which you believe the RA will be obligated to owe you, based on an implicit or explicit promise or understanding, the following:….." The second set of instructions read, "Please indicate the extent to which you believe that you are obligated to owe the RA the following:….." Participants were provided with a seven-point Likert-type scale, ranging from "not at all obligated" to "very obligated" along with a list of obligations drawn from study 1. Thus, a high score indicated high perceived obligation, and a low score indicated low perceived obligation in the user-RA relationship.

In total, thirty-eight participants across two classes were surveyed that included five different majors. We had five freshmen, seven sophomore, fifteen juniors, and eleven seniors in our sample. Thirty-five percent were women. The average computer experience was 3.4 years (S.D. = 0.64) and the average experience with RA was 1.4 years (S.D. = 0.76).

Study 2: Results

Based on the open-ended responses, as we did for study 1, we compiled a list of the most commonly reported obligations. Interestingly, all the obligations determined in study 1 were also reported by participants in their open-ended responses along with some additional obligations. Some of the additional user obligations towards RA are: (1) Don't just rely on RA judgment and use own knowledge; and (2) Only one request at a time. Some of the additional RA obligations towards user are: (1) Not act as an online pushy salesman; and (2) Recommendations are provided within acceptable time; Moreover, we found that all the obligations determined in study 1 were considered as high perceived obligations in the user-RA relationship as the all obligations received an average score of over 6 with S.D. less than 1.

Study 3 (Data not available yet)

The central aim of study 3 will be to assess a list of high perceived obligations in user-RA relationship. We will use student participants from undergraduate as well as graduate classes in a major North American university. Questionnaire for this study will be similar to study 2 where two sets of questions asked participants to indicate their preference for obligations (user to RA and RA to user) from the set of items provided that will be provided to them. Combination of obligations elicited from study 1 and 2 will be provided to the participants for this study.

Study 4 (Data not available yet)

In study 4, using student participants, we will assess effects of unfulfilled obligations by an RA. Measurement items would be based on existing scales. A measure of psychological contract breach would be constructed using most important dimensions of psychological contract determined in study 3.

A questionnaire with different vignettes will be used to measure the influence of psychological contract breach on usefulness in RA, trust in RA, and intentions to purchase recommended products. Vignettes have been used in much prior IS research (e.g., Lamb and Kling, 2003). This approach concentrates on the hypothetical scenarios where impartial spectators (i.e., participants in the study) are questioned. Seven different types of vignettes will be created ranging from very unfair treatment (i.e., where no obligation is met) to very fair treatment (i.e., where all the obligations are met).

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