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The Buck Stops There: The Impact of Perceived Accountability and Control on the Intention to Delegate to Software Agents

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Abstract

Software agents with the ability to recommend actions, aid decision-making, and actually make decisions are becoming increasingly common. In many situations, users now choose whether or not to delegate tasks to these agents. While some research has examined software agents, relatively little is known about the factors that influence the intention to delegate decisions to them. An experiment was used to examine the influence of perceived accountability, extent of control, and trust in the agent on the intention to delegate a travel arrangement decision. Users were more likely to delegate to agents that gave them greater control by requiring them to approve the agent's recommendation before the decision was completed than to agents that performed the task autonomously without intervention after it was delegated. Contrary to expectations, intention to delegate increased as perceived accountability increased. Participants may perceive delegation as a means to shift blame from themselves to the agent and thus mitigate risk resulting from potential negative decision outcomes.

Keywords: Software Agents, delegation, recommendation agent, accountability, trust, control, blame

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INTRODUCTION

Advances in artificial intelligence and other information technologies have led to the development of software agents (SAs) with capabilities beyond those of traditional software applications (Aljukhadar et al., 2012; Benbasat, 2010; Hess et al., 2000; Maes, 1994; Nwana and Ndumu, 1999; Parkes, 2012; Reisen and Hoffrage, 2010; Wang and Benbasat, 2007). SAs may provide recommendations, work autonomously to make decisions and complete tasks without intervention by the user, adapt to changes in their environment, and communicate and work with other agents or users (Featherman and Pavlou, 2003; Hess et al., 2000; Maes, 1995; Milewski and Lewis, 1997; Parkes, 2012; Schiaffino and Amandi, 2009). Due to this additional functionality, the interaction between a user and a SA differs from that of traditional software applications; instead of interacting through direct-manipulation, users must choose whether or not to delegate all or part of a decision to the SA. The SA then completes all or part of the decision-making action autonomously, without human intervention (Hess et al., 2000). The choice to delegate responsibility to a SA is theoretically different than simply using a software application because the principal must decide whether to transfer complete or partial control over the decision outcomes to the SA, and little is known about this process (Dehais et al., 2009; Hexmoor and Battula, 2004).

Delegation to human agents is a crucial business skill for successful managers (Milewski and Lewis, 1997; Yukl and Fu, 1999), but it is not without challenges. Some managers may delegate only undesirable decisions or mundane tasks, which can lead to subordinate dissatisfaction (Axley, 1992; Schriesheim et al., 1998) or managers may choose not to delegate because they perceive that subordinates lack the capability to handle the task (Leana, 1987). Even when capable individuals are available for delegation, a manager may choose to retain responsibility because of risk aversion, desire for control, lack of trust in the subordinate, or incorrect perceptions of a subordinate's ability or willingness to perform a task (Axley, 1992). If managers feel highly accountable for the results of the decision, they may be reluctant to delegate to others and lose control over task outcomes (Axley, 1992).

Our research examines how delegation between a user and a SA is similar to the delegation process between individuals (Castelfranchi and Falcone, 1998; Dickinson, 1998; Milewski and Lewis, 1997). When choosing whether or not to delegate, individuals may be influenced by (1) how accountable they feel for the results of the decision, (2) how much control they have over the agent and (3) how much they trust the agent (Eisenhardt, 1989). These antecedents may affect delegation to SAs in the same way they influence delegation to human agents, or they may not. Our focus is on the extent to which these factors from extant research on delegation to human agents influence the intention to delegate to software agents.

PRIOR RESEARCH AND THEORY

Delegation is the "process of passing on responsibility for a task to a subordinate by giving him/her authority to act on your behalf, but without giving up control, or ultimate accountability" (Milewski and Lewis, 1997, p. 448). Delegation is a process whereby an individual transfers decision-making authority to another (Leana, 1987). More than simply assigning a task, it is also the transfer of some right, obligation, responsibility, power, and so on (Falcone and Castelfranchi, 2001).The delegation process entails the transfer of hands-on control while retaining ultimate responsibility for the decision (Axley, 1992; Chen and Aryee, 2007; Klein et al., 2006).

Agency theory is the fundamental theory underlying delegation, in which one individual (the principal) delegates work to another (the agent) (Arrow, 1971; Eisenhardt, 1989; Jensen and Meckling, 1976; Wilson, 1968). Agency theory has been the subject of extensive research over the decades since its introduction and has been applied in many disciplines (Eisenhardt, 1989; Pavlou et al., 2007; Vaidyanathan et al., 2012). Agency theory focuses on two primary issues associated with delegation (Eisenhardt, 1989).

First, when the principal delegates a decision to an agent, the risk is now shared between the two, and the two may not have the same attitude toward risk (Eisenhardt, 1989). If the agent fails to complete the decision task appropriately it can have a negative impact on the principal. Thus even though the decision has been delegated to an agent, the principal may be held accountable for the failure of the agent to complete it in an appropriate way. For this reason, the extent to which principals feel that they are accountable is an important factor influencing delegation. Principals may choose not to delegate when they are highly accountable for the outcomes (Jenks and Kelly, 1985; Leana, 1987). This is particularly true if they will have little control over the process once the decision has been delegated (Jenks and Kelly, 1985; Leana, 1987).

Second, the agent and the principal may not share the same goals and it may be difficult for the principal to verify that the agent has made the decision as the principal would desire (Eisenhardt, 1989). The issue is one of the agent's competence and motives – can and will the agent make the decision desired by the principal, even if the principal cannot verify the outcome? For this reason, managers tend to delegate to subordinates who are perceived to be competent and able to handle tasks (Leana, 1986) and have the same goals as the manager and the organization (Leana, 1987; Yukl and Fu, 1999). In short, managers delegate to those they trust (Aggarwal and Mazumdar, 2008; Al-

Natour et al., 2008; Fuller et al., 2007).

Agency theory and research on delegation has focused on human actors (Eisenhardt, 1989; Jenks and Kelly, 1985; Leana, 1987). We know little about the factors that influence delegation to SAs. However, we believe that the best starting point for research on delegation to SAs lies in prior research on delegation to human agents.

In this paper we draw on research with human actors to examine how three factors from human delegation influence the delegation to SAs. We focus on the two fundamental issues from agency theory: accountability and trust in the agent (Eisenhardt, 1989). To this we add a third factor known to influence delegation: the extent of control the principal has over the agent (Jenks and Kelly, 1985; Leana, 1987). The extent of control is not unique to software agents; principals can exert varying levels of control over human agents as well. Extent of control is an important factor in SAs, because they can be built to do many different things (Hess et al., 2000). We begin with a review of SAs and then turn to the two fundamental issues in agency theory: accountability of the principal and trust in the agent.

Software Agents

Software agents are becoming increasingly important (Aljukhadar et al., 2012; Benbasat, 2010; Hosack et al., 2012; Matt et al., 2013; Parkes, 2012). A SA makes a decision or performs a task in a specific domain on behalf of a principal (i.e., a human controlling the agent) (Hess et al., 2000). SAs differ from traditional software applications in that they integrate features and artificial intelligence to assist the principal with decision making and task completion (Xiao and Benbasat, 2007). Although SAs may be defined in many ways, we adopt the definition of Milewski and Lewis (1997) that SAs "act on behalf of users by autonomously carrying out delegated activities made up of multiple sub tasks" (p. 487). SAs are not simply tools, but may be independent agents capable of making decisions without direct manipulation (Hess et al., 2000). Thus, there could be variability in outcomes from tasks over time as the SA adapts to changes to variables involved with sub tasks. Compared with traditional applications, the extended range of functionality, including adaptability, may lead to increases in efficiency and effectiveness for SAs (Gregor and Benbasat, 1999; Jennings, 1999; Maes, 1995; Nwana et al., 1996; Wang and Benbasat, 2007; Wooldridge, 1997).

Advanced and properly configured SAs may perform some tasks more aptly than humans (Maes, 1995; Negroponte, 1995; Reisen and Hoffrage, 2010). An agent's ability to work autonomously, quickly, and persistently without rest may alleviate human handling of mundane, tedious, or repetitive tasks. SAs may enable better decision-making for managers by handling complex algorithms and discerning and adapting to complex patterns that humans miss (Häubl and Trifts, 2000; Komiak and Benbasat, 2006). In contrast with human agents, managers do not need to motivate a SA to perform tasks or be concerned about ulterior motives, presuming that the SA has been designed as stated. Recently researchers have begun to examine adoption of and response to a variety of SAs, but as yet have not examined the decision to delegate tasks to SAs and the antecedents to this decision (Chen and Aryee, 2007; Komiak and Benbasat, 2004, 2006; Qiu and Benbasat, 2009; Wang and Benbasat, 2005, 2007).

SAs take many forms and have different features and capabilities which may affect how individuals perceive and interact with a given agent (Hess et al., 2000; Xiao and Benbasat, 2007). For example, a SA may be highly personalized or not (Komiak and Benbasat, 2006), or may be displayed in human form (Qiu and Benbasat, 2009). One fundamental characteristic of a SA that distinguishes it from other software tools is its ability to act autonomously without interaction from the principal (Hess et al., 2000; Milewski and Lewis, 1997). Thus once the task is delegated, the SA has the authority to complete the task without intervention from the principal.

One important characteristic of delegation to a SA is the extent of control the principal has over the agent. Control involves ascertaining whether an action has been successfully executed and dealing with deviations and unforeseen events in order to cope positively with them (Baliga and Jaeger, 1984; Henderson and Lee, 1992; Ouchi, 1979; Ouchi and Maguire, 1975). In one form of SA, the principal gives up control once the decision has been delegated to the agent (Milewski and Lewis, 1997). The advantage of this is that the principal no longer has to be concerned with the decision once it is delegated. The SA completes the decision task and the principal is free to do other work.

However, many principals are unwilling to relinquish complete control to an agent, software or human (Jenks and Kelly, 1985; Leana, 1987). As a result, a form of SA has emerged that provides more control to the principal. With this type of SA, often called a *recommendation agent*, the principal retains final approval over the decision; the SA does not complete the decision task until the principal gives final approval (Benbasat, 2010; Matt et al., 2013; Reisen and Hoffrage, 2010). When principals delegate to this type of SA, they delegate some responsibility to the SA to provide options and guidance, but *not* to make the decision autonomously. Typically, the SA works on the task and provides a small set of recommended options to the principal. The principal then intervenes and approves the preferred option before the SA completes the task. Of course, the principal may approve none of the recommended options and instead choose to reconfigure the task and re-delegate it to the SA or perform it personally. This type of SA is sometimes used for consumer purchases on the Web (e.g., Aksoy et al., 2011; Huang et al., 2011; Lee and Benbasat, 2011; Xiao and Benbasat, 2007).

Research with human agents shows that principals can be reluctant to delegate a decision to an agent for fear of losing control (Leana, 1987). Therefore, we believe that the extent of control over the SA will have an important influence on whether principals choose to delegate to the SA or not. The additional control provided by requiring the principal's approval prior to the completion of the task by the SA should mitigate the fear of losing control. When principals feel they have control of the delegation process and must intervene to ensure the quality of the outputs, they will be more likely to delegate tasks to a SA. Therefore, we predict that principals will be more likely to delegate a task to a SA if the SA provides greater control to the principal by requiring approval of a course of action before completing the task. Thus:

H1: Individuals will have greater initial intention to delegate to a software agent if they have control over its execution by approving a decision prior to task completion.

Perceived Accountability

Perceived accountability is the implicit or explicit expectation that a person's beliefs, actions, or feelings may need to be justified to others (Frink and Klimoski, 2004; Scott and Lyman, 1968; Semin and Manstead, 1983; Tetlock, 1992). Individuals who perceive they are accountable expect an evaluative process with negative or positive consequences to follow task outcomes (Lerner and Tetlock, 1999). It is the perception that one is accountable and the expectation of evaluation that drives behavior rather than actual accountability (Thoms et al., 2002).

People who perceive they are accountable behave differently due to the expectation of evaluation (Kennedy, 1993; Lerner and Tetlock, 1999; Tetlock, 1992). When people feel accountable, they search more diligently for task-relevant information, find more support for decisions, develop stronger justifications for choices, and complete tasks themselves more often, especially decision-making tasks (Davis et al., 2007; Koonce et al., 1995; Scholten et al., 2007; Siegel-Jacobs and Yates, 1996). This increased diligence is motivated by a desire to perform well and can be viewed as a mechanism to mitigate potential negative consequences arising from poor task outcomes.

High levels of perceived accountability may also lead individuals to exert extended effort to justify a decision. Extra effort is made in an attempt to develop excuses to protect the image of the individual should negative results occur (Lerner and Tetlock, 1999). Consequently, individuals will be less likely to delegate to an agent when held accountable for decision outcomes because they forego the opportunity to prepare justification in the event of failure, which could lessen negative consequences (Aggarwal and Mazumdar, 2008).

Some managers may consider delegation to be a mechanism for passing blame in the case of poor task outcomes (Green et al., 2000; Moon and Nass, 1998; Serenko, 2007); however, poor performance by an agent also acts as a signal that the manager is not effectively managing subordinates or carefully selecting individuals capable of performing delegated tasks. Because poor agent performance negatively reflects on the manager, when managers perceive they are accountable for the performance they will be much more careful and less likely to delegate decisions, even to capable and appropriate agents (Green et al., 2000; Moon and Nass, 1998; Serenko, 2007).

When considering delegation to a SA, we also expect that principals will prefer to control and fully understand the decision process by performing the tasks and making the decision themselves so that they can justify actions later. Even with the reporting functionality of some SAs, principals want to know why a decision failed; this can only be fully understood by performing the task themselves. Overall, individuals that perceive they will be held accountable for task outcomes will be more likely choose to perform the decision task rather than delegate the task to a SA.

H2: As perceived accountability increases, intention to delegate to a SA will decrease.

Trust in the Agent

Substantial research on agency theory has examined the relationship between the principal and the agent and the extent to which the principal believes the agent can complete the task and make decisions as promised (i.e., has goals that align with the principal's goals) (Eisenhardt, 1989). This ability to complete the decision task and the integrity of the agent to do what the principal wants are key components of trust (Mayer et al., 1995). Trust has been shown to influence the delegation to human agents (Aggarwal and Mazumdar, 2008; Brower et al., 2000; Whitener et al., 1998). When individuals feel that an agent warrants trust, they become willing to depend upon the agent in situations where risk is involved (Mayer et al., 1995), thus increasing the likelihood that they will delegate to that agent. The trusting principal does this because of perceptions about the ability, integrity and benevolence of the other (McKnight et al., 2002).

Research in information systems has shown that trust has a strong influence on the usage of information technologies and SA in particular (Hosack et al., 2012; Kim et al., 2008; Parkes, 2012; Pavlou, 2003). Trust also increases the likelihood that a user will adopt recommendation agents (Komiak and Benbasat, 2006; Parkes, 2012). Therefore:

H3: As trust in the agent increases, intention to delegate to a SA will increase.

METHODOLOGY

Two independent variables, extent of control and accountability, were manipulated in a laboratory experiment to test the hypotheses. The experimental data collection followed two pilot tests in which the tasks and scales were refined.

Participants

Graduate business students (N = 94) at a large public university participated in the research study and were randomly assigned to treatments. Participants ranged from 21 to 44 years old with an average age of 27. There were 39 males and 55 females in the sample

Task

The task was scenario-based and designed with a context suitable for the participants. The participants, graduate students in a twelve-month program, interview throughout the year and often make travel arrangements as part of the recruiting process. They are concerned about charging travel expenses and receiving reimbursement from potential employers. The scenarios we developed matched this context; participants were asked to decide whether or not to delegate travel arrangements for a job interview to a SA.

The scenarios described a new SA application available to students that would search for viable travel options, make a decision about the best option, book the travel arrangements, and record the expenses to an account associated with the university and employers. The SA could handle the multi-task objectives for participants if they were willing to delegate the task to the SA over the course of the year. Students would provide travel details (travel dates, smoking/non-smoking requirements, dietary restrictions) as well as preferences, such as times of departure and arrival, use of taxis, rental cars, personal cars, airport shuttles, and so on. In the scenarios, the SA was described as having characteristics typifying intelligent agents and was even given a human name, TARA, to personify the agent and increase anthropomorphism. Participants were told the SA could learn and adapt to unforeseen events, implying variability of outcomes. The description helped convey that TARA was an intelligent agent rather than a traditional, direct manipulation application like Expedia or Travelocity.

Measures

The objective of this study was to assess the impact of perceptions of control, accountability, and trust in the SA on the individual choice to delegate to a SA.

Extent of Control

The extent of control was a binary variable (high, low) and was manipulated in the scenarios by changing text stating whether the user had to approve the SA decision or not. In the low control treatment, the text depicting the delegation agent indicated that once the user decided to delegate, the SA would autonomously make a decision without intervention; the SA would make the travel arrangements using the parameters specified by the user. In the high control treatment, the text indicated that before the SA would complete the task, the user would be presented with a recommended choice and several options. Only after the user approved the recommended choice (or another option) would the SA complete the task.

Perceived Accountability

It is an individual's *perception* of accountability rather than actual accountability that drives behavior (Thoms et al., 2002). Different people may have very different perceptions of accountability in the same situation. We therefore manipulated text about accountability in the scenario and then measured each participant's perceived accountability. The scenario text about accountability was manipulated by changing the manner in which the university and recruiting companies would monitor and evaluate the travel arrangements that were made and the expectation that participants might be required to explain and justify their travel arrangements. Individual perceptions of accountability have been measured in previous research using single yes/no questions about whether participants believed they would have to explain, justify and defend a task outcome (e.g., Sedikides et al., 2002); however, it has been suggested that accountability is inherent in nearly all situations and should be measured with Likert-type scale items to overcome reliability problems (Tetlock, 1999). Since no measures were found to assess perceived accountability in this manner, we developed a ten item scale to assess perceived accountability (Cronbach's alpha = .72). The items in this scale can be found in the Appendix.

Trust in the SA

Several studies have measured trust in various types of information technologies, but there was no generalized scale for trust in a SA. We modified the wording of items from McNight, Choudhury, and Kacmar's (2002) measure of trust to create a three item scale (Cronbach's alpha = .88) to assess trust in the agent. The items are listed in the Appendix.

Dependent Variable

Delegation has typically been measured in prior research using behavioral observations; however, our interest was in the intention to delegate so this approach was not appropriate for our research. Because we did not find an intention to delegate scale, we created three scale items (Cronbach's alpha = .93) modeled after the three items for behavioral intention to use a system created by Venkatesh et al. (2003) using our definition of delegation as a guide. These items are listed in the Appendix.

Control Variables

The SA the participants evaluated was an Internet-based travel arrangements agent. There is some evidence that the principal's own ability to effectively complete the decision task can influence delegation (Leana, 1986). Therefore, we included two control variables designed to assess an individual's ability to make travel decisions and comfort in using the Internet.

Travel Competence

Travel competence is an individual's perception that they can make the travel arrangement decision. No appropriate measures of travel competence existed, so we created a five item scale (Cronbach's alpha = .77) that assessed participants perceived competency in completing the travel task by adapting items from the travel skill items developed by O'Connor and Siomkos (1994). These items are listed in the Appendix.

Internet Comfort

To assess the participant's comfort level with working on the Internet, we created a five item scale (Cronbach's alpha = .71) by adapting items from several scales designed to measure both Internet capability and Internet comfort (Durndell and Haag, 2002; Morahan-Martin and Schumacher, 2007; Schumacher and Morahan-Martin, 2001). The scale items are listed in the Appendix.

Procedures

Participants first answered demographic questions, and completed the travel competence and Internet comfort scales. Next, participants read one of the scenarios describing the SA and completed a questionnaire assessing their perceptions of accountability, trust in the agent, and intention to delegate the task to the SA. The time needed to complete the experiment ranged from 20-30 minutes.

RESULTS

Because the data came from a single questionnaire, we first assessed possible common method variance using Harman's single-factor method (Podsakoff et al., 2003). In this test, the results from an exploratory factor analysis are used to examine if a single factor is responsible for excessive variance due the use of a common method. In our analysis, the first extracted factor explained 19% of the variance and no factor dominated, indicating that our data did not exhibit bias due to the use of a common method. The data were analyzed using a general liner model in SPSS. The results are summarized in Table 1.

Hypothesis 1 proposed that individuals would be more likely to delegate to a SA when they had greater control. As anticipated, the results showed that exposure to the SA providing greater control (i.e., the recommendation agent) was associated with greater intention to delegate; $F(1,88) = 12.383$, $p = .001$ (see Table 1). H1 was supported.

Hypothesis 2 proposed that principals who perceived a higher level of accountability would have less intention to delegate to the SA than those who perceived a lower level of accountability. The analysis indicated a significant relationship, but in the opposite direction than expected; $F(1,88) = 9.565$, $p = .003$ (see Table 1). The results demonstrated that individuals who felt high levels of accountability had *greater* intention to delegate. H2 was not supported.

Hypothesis 3 proposed that as trust in the SA increased, individuals would be more likely to delegate to the agent. As expected, there was a significant relationship between trust in the SA and intention to delegate, $F(1,88) = 67.419$, $p = .001$, such that higher levels of trust were associated with greater delegation intention. H3 was supported.

We also examined two control variables. We found no significant relationship between travel competence and intention to delegate, $F(1,88) = .039$, $p = .845$, and no relationship between Internet comfort and intention to delegate, $F(1,88) = 1.217$, $p = .273$.

Table 1. Statistical Results for Intention to Delegate

Factor	Beta	F	P-value	Eta-Squared
H1: Extent of Control	.637	12.38	.001	.096
H2: Perceived Accountability	.319	9.57	.003	.076
H3: Trust In the Agent	.833	67.42	.001	.328
Control: Travel Competence	-.018	0.04	.845	.006
Control: Internet Comfort	-.126	1.22	.273	.021

DISCUSSION

The results suggest that the intention to delegate to a SA differs from the intention to delegate to an individual. We first explore these results and then discuss their implications for both research and practice.

The primary finding of interest is that the relationship between perceived accountability and intention to delegate was significant, but in the opposite direction from what was predicted. Following the management literature we proposed that as perceived accountability increased individuals would have less intention to delegate (Aggarwal and Mazumdar, 2008; Jenks and Kelly, 1985). However, the results indicated the opposite: as perceived accountability increased, individuals had more intention to delegate. Thus delegation to a SA appears to be a different process than delegation to a human.

One plausible explanation may come from the perspective of assigning blame. Individuals may be more willing to "pass the buck" to the SA as a means of reducing accountability and potential negative consequences (Green et al., 2000; Moon and Nass, 1998; Serenko, 2007; Villena et al., 2009). By delegating to a SA, an individual can create distance in the event of a negative outcome with less guilt than when blaming another individual. This is supported by organizational-level research that examined blame and consequences when errors were attributable to technology instead of a human; when the error was technology-oriented, there was less attribution of blame to the organization (Naquin and Kurtzberg, 2004).

It is possible that people realize negative consequences can be more easily shifted away from themselves in situations when the technology fails by transferring associated responsibility to the technology (Chu and Rouse, 1979). This is a possible negative consequence of technology development where errors and bugs in applications are commonplace. Thus while the failure of a human subordinate to successfully perform a task reflects poorly on a manager, the failure of a SA to successfully complete a task may be viewed as the failure of the technology, its designer, or its maintainer instead of the principal. The technology provides a scapegoat that can be blamed readily and without complaint.

The other finding of interest is that the level of control influenced the likelihood of delegation. When the SA autonomously made the decision and completed the task without intervention, participants were less likely to delegate than when the SA stopped for decision approval from the user before completing the task. Thus although SAs can be designed to run autonomously to task completion, this may not be a good design strategy for the majority of users. Our results also suggest that participants were comfortable delegating to SAs; even though they had no experience with this SA, over 80% indicated they would delegate travel arrangements.

We found support for the hypothesis that trust in the SA influences intention to delegate. This has been shown for one type of SA in past research (Komiak and Benbasat, 2006), so it is less surprising, but it is good to confirm this relationship for the SAs studied in this research.

Implications for Research

Our results suggest that delegation to a SA is fundamentally different than delegation to a human agent. The role accountability plays in the delegation process for SA technology is rich in opportunity for future research. The relationship between perceived accountability and intention to delegate is intriguing because the relationship is

significant and opposite from what was expected based on delegation to human agents. This study is an initial examination into how delegation to a SA application is different from delegation to another person; however, more research should closely examine the dynamics of delegating to SA applications.

We believe the most likely of the possible explanations for the positive relationship between accountability and intent to delegate is that people look for means to pass or share blame when task outcomes are not desirable (Friedman, 1995; Moon and Nass, 1998). Research using agency theory has found that principals are more likely to delegate to a human agent when they anticipate a negative outcome because this enables them to shift some of the blame to the agent (Bartling and Fischbacher, 2012). The key factor in delegation to human agents is the anticipation of a negative outcome. Did our participants consciously or subconsciously anticipate a negative outcome as perceived accountability increased? Perhaps participants perceiving higher accountability anticipated negative appraisals and thus chose to use the SA to pass the blame. Likewise, participants who felt lower accountability might have had lower expectations of a negative evaluation and thus felt no need to shift blame to the SA. More research is required to determine if this explanation is a primary cause of the positive relationship between perceived accountability and intention to delegate to a SA.

Research should also examine individual perceptions of responsibility when delegating to a SA. Does a person who delegates to a SA expect fewer negative consequences because part of the accountability or blame is passed to the SA? Does the audience holding the person accountable also perceive a difference in accountability when the person delegates to a SA? The principal may be using the SA to deflect blame, but this strategy may not be an effective one especially over time. Those holding the principal accountable may consider the principal more at fault than if they had delegated to a human because of the perception that the SA does not make errors.

This study has implications for the design of SAs. Although it is possible to design a SA to make decisions and complete tasks autonomously without intervention from the user, this may not be what users want. Our research suggests that users are more likely to delegate to a SA when they have the opportunity to (or more precisely, are required to) intervene and approve the SA's decision recommendations before the SA completes the task. Differences in the agents and their role in the delegation process should be explored further. In particular, it would be valuable to understand which characteristics of agents are more influential during the various stages of the delegation process (Xiao and Benbasat, 2007). Since SAs differ in their ability to provide monitoring and control functionality, future research should also examine how SAs and their features influence delegation throughout the process. More research is needed to identify the ideal balance between the extent of control and the likelihood of delegation.

Additional research should also examine how these relationships change over time as experience with the technology increases. Familiarity with a SA may lead to significant changes in the relationships between extent of control, trust, and accountability, and subsequently, the intention to delegate (Komiak and Benbasat, 2006). Information technology has been touted as a more reliable and credible information source than humans (Tseng and Fogg, 1999) and some individuals may rely on it to a greater extent than they should (e.g., Parasuraman et al., 1993; Parasuraman and Riley, 1997; Riley, 1996). As the principal experiences successes and failures with a SA over time, the relationships in our model may change so that the user becomes more comfortable with lower levels of control. However, this remains an empirical question.

In this study, we used a task in which the SA made travel arrangement decisions. Task type, importance, and complexity may also influence intention to delegate. A principal must perceive that the agent is capable of completing the task. However, individuals may not be able to accurately assess whether a SA is capable of handling a task. While technology continually advances, some individuals may perceive the technology capable of handling only simple tasks such as searching, sorting, comparing, organizing and reporting. Individuals may believe that more complex decision-making tasks, requiring higher levels of reasoning, are beyond a SA's capability. These perceptions may influence the intentions to delegate higher complexity decision tasks to SAs. Further research is needed to determine what tasks people perceive SAs are capable of handling.

Implications for Practice

The current research provides insight for the practitioner both from a designer and user perspective. Designers of SAs should incorporate features into the technology to support increased user control if they want to increase the likelihood that the SA is adopted. When delegating the task of making and enacting a decision to a SA, a control mechanism that allows/requires a final approval from the user before the SA completes the task will increase the likelihood that users will choose to use the SA.

When organizations adopt SAs, they should be cognizant that employees may gain performance benefits from the use of the SAs, but they may also be motivated to use SAs to reduce potential negative consequences when there are suboptimal decision outcomes. This may be the case when individuals feel highly accountable for outcomes. Users may feel they can reap the efficiency and effectiveness benefits gained from using a SA while blaming the SA for any negative consequences. Users may even assume that blame will be transferred to the technology and be surprised

when they are ultimately held accountable. It would be prudent for parties holding the user accountable to emphasize that both process and outcome are important and make it clear that the user is ultimately responsible for decisions, especially when there are control mechanisms that help prevent errors from occurring.

The current research suggests that with increased accountability individuals will be more likely to delegate to SAs. However, potential misuse in the form of over-reliance on SAs may occur. In particular, when individuals are in a situation of high accountability, they may rely on the SA rather than use their own abilities. Managers should take care not to overuse the technology in situations where it is inappropriate. Those holding users accountable should encourage them to be aware of situations in which delegation to the SA is not warranted.

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APPENDIX

Measurement Items

Construct	Items
Intention to Delegate	I plan to have TARA* act on my behalf and make travel arrangements for me.
	I intend to have TARA handle the travel task for me.
	I choose to utilize TARA for making travel arrangements for me.
Perceived Accountability	I believe others will evaluate my travel arrangements.
	I may need to defend the travel arrangements that are made.
	The process used to choose my travel arrangements will need to be explained
	The costs of the travel arrangements will need to be justifiable.
	The travel arrangements will be reviewed.
	I believe others will review the travel expenses.
	I will need to justify the process used in making travel arrangements.
	I may need to provide a good reason for the travel arrangements that are made.
	It is possible that justification of the travel decision process will be requested.
	The expenses of the travel will be checked.
Trust in the Software Agent	I believe TARA would act in an appropriate manner in doing this task.
	Given this context, TARA would be reliable.
	Given this scenario, I believe TARA would act in my best interest to complete this task.
Travel Competence	I have experience making travel arrangements.
	I am competent in making travel arrangements.
	I have the skills necessary for making travel reservations.
	I have the knowledge to complete the task of making travel arrangements.
	The process of hunting and deciding on travel arrangements is fun.
Internet Comfort	I feel assured that legal and technological structures adequately protect me from problems on the Internet.
	I feel confident that encryption and other technological advances on the Internet make it safe for me to do business there.
	I am comfortable using the Internet to transact business.
	In general, the Internet is now a robust and safe environment in which to transact business.
	The Internet has enough safeguards to make me feel comfortable using it to transact personal business.

* TARA was the name given to the agent.

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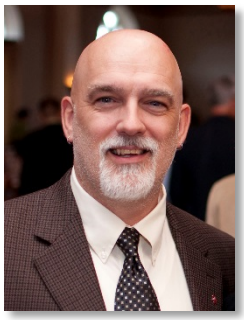

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