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DISCRETE EMOTIONS AND TRUST IN SELF-SERVICE TECHNOLOGY

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ABSTRACT

Due to the high degree of uncertainty and risks present in the initial adoption of self-service technologies, trust in technology plays a central role in determining customers' acceptance and adoption of technology. This paper investigates the influence of discrete emotions toward using a self-service technology on trust in the technology. Drawing on the cognitive appraisal theory and affect-as-information theory, this paper formulates a theoretical framework positing that the cognitive appraisals of technology usage outcome's desirability and causal agency are the key determinants of emotions toward using the technology, which in turn influence trust in the technology. This paper provides a new framework to investigate the relationship between emotions and trust in technology and the findings of this research are expected to inform better technology design with the goal of maximizing trust in technology.

Keywords

Self-service technology, trust, cognitive appraisal, discrete emotions

INTRODUCTION

Due to the advancement and proliferation of information and communication technologies in today's world, self-service technology applications have become increasingly prevalent. Self-service technology (SST) is a technology that enables users to produce a service independent of direct service employee involvement (Meuter, Ostrom, Roundtree and Bitner, 2000). There are many different types of self-service technologies such as Internet-based applications including e-commerce and online financial applications, interactive kiosks including hotel check-out kiosk and airline check-in kiosk, and etc. In recent years, more and more innovative self-service technologies are introduced across a variety of industries replacing traditional face-to-face services. While self-service technology can bring the benefits of convenience, perceived control, and flexibility to customers (Meuter et al., 2000; Yen, 2005); however, technological problems such as technology failures, process failures, service design problems, technology design problems, and customer driven failures (Meuter et al., 2000) may inhibit the adoption of self-service technology. The challenge facing self-service technology is about getting consumers to use the technology (Bitner, 2001; Liljander, Gillberg, Gummerus and Riel, 2006).

Due to the high degree of uncertainty and risks present in the initial adoption of most self-service technologies, such as e-commerce, trust in technology plays a central role in determining customers' acceptance and adoption of technology, such as e-commerce systems (Pavlou, 2003). According to Chopra and Wallace's (2003) definition of trust, this paper defines trust as the willingness to rely on a self-service technology, based on confidence that one's trust will lead to positive outcomes. In recent years, much research has been done on trust in ICT (Komiak and Benbasat, 2006; Vance, Elie-Dit-Cosaque and Straub, 2008; Wang and Benbasat, 2005). There is an increased interest in the emotional aspect of trust in technology. Komiak and Benbasat (2006) argue that cognitive beliefs alone are inadequate to explain trusting decisions because these decisions involve both reasoning and feeling. Schwarz's notion of affect-as-information (Schwarz, 1990) suggests that people use emotions as a "how do I feel about it?" heuristic when making evaluations and judgments in a context lacking in relevant information (Schwarz, 1990). This is especially true for the technology trusting decisions made during the initial stage of technology adoption when there is not enough information to reason. In other words, at the initial adoption of new self-service technology, people's decisions of whether to trust the technology are particularly likely to be influenced by their feelings about the technology. This paper aims to expand the existing research on trust in technology by exploring the influence of discrete emotions on trust in self-service technology.

THEORETICAL BACKGROUND

The cognitive appraisal theory is the most dominant theory of emotions in the literature and provides a promising perspective for studying the influence of emotions on trust in the context of self-service technology adoption. The cognitive appraisal theory views emotions as "valenced reactions to events, agents, or objects, with their particular nature being determined by the way in which the eliciting situation is construed" (Ortony, Clore and Collins, 1988, p. 13). It emphasizes that experience of different emotional feelings is determined by how the emotion-eliciting stimulus is interpreted along a number of appraisal dimensions (Scherer, 1993; Smith and Ellsworth, 1985).

The cognitive appraisal theorists identified a number of cognitive appraisal dimensions that are important in distinguishing different emotions (Ellsworth and Smith, 1988; Frijda, 1993; Izard, 1992; Lazarus, 1991; Smith and Ellsworth, 1985). The most important cognitive appraisal dimension of emotions is the appraisal of outcome desirability, which refers to the appraisal of how desirable or undesirable an event's outcome is perceived to be. It accounts for the majority of variance in emotions and determines the valence of emotions by distinguishing between positive and negative emotions (Ellsworth, 1994; Ruth, Brunel and Otnes, 2002; Smith and Ellsworth, 1985). For example, positive emotions, such as happiness, gratitude, and pride, result from perceived desirable outcomes; while negative emotions, such as disappointment, anger, and shame, are caused by perceived undesirable outcomes. Another important appraisal dimension of emotion identified by prior work is the appraisal of agency, which is concerned with whom or what (i.e. oneself, another person or thing, or the general circumstances) is perceived to be the cause of an outcome. The appraisal of agency is most important in differentiating among discrete emotions of the same valence (Ellsworth and Smith, 1988; Ruth, Brunel and Otnes, 2002). For example, the emotions of anger, shame, and disappointment are all negative in valence, but they differ in terms of the appraisal of agency. Anger results from highly perceived other agency; shame is a result of highly perceived self agency; and disappointment is caused by highly perceived circumstance agency. In the context of self-service technology adoption, when evaluating an undesirable technology usage outcome, people are likely to feel angry if they perceive others such as the technology to be the cause of the undesirable outcome, feel shameful if they perceive themselves to be responsible for the undesirable outcome, and feel disappointed if they attribute the undesirable outcome to general circumstances such as bad luck or chance. Likewise, the emotions of gratitude, pride, and happiness, while all being positive emotions, are respectively characterized by high other agency, high self agency, and high circumstance agency. When assessing a desirable technology usage outcome, people feel gratitude when they attribute the desirable outcome to the technology, feel proud if they perceive themselves to have caused the desirable outcome, and feel happy when the desirable outcome is attributed to general circumstances such as good luck or chance.

Consistent with the affect-as-information theory (Schwarz, 1990), it has been well established that emotions influence people's decision-making and judgments (Lerner and Keltner, 2000; Lewis and Barrett, 2009), such as social judgment (Keltner, Ellsworth and Edwards, 1993), risk perception (Lerner and Keltner, 2000, 2001), and attribution (Lerner, Goldberg and Tetlock, 1998). Schwarz and Clore's study (1983) suggests that people tend to rely on their emotions as easily accessible information to judge new objects. People experiencing negative emotions may refer to their negative feelings as a sign that they dislike a new object; on the contrary, feelings of positive emotions may be taken as a sign of liking a new object. The impact of emotions even goes beyond the influence of affective valence. More recent research findings highlight the differential influence of discrete emotions with the same valence on cognition (DeSteno, Petty, Rucker, Wegener and Braverman, 2004; Griskevicius, Shiota and Neufeld, 2010; Lerner and Keltner, 2000).

THEORETICAL FRAMEWORK AND HYPOTHESES

Drawing on the cognitive appraisal theory (Ellsworth and Smith, 1988; Frijda, 1993; Izard, 1992; Lazarus, 1991; Smith and Ellsworth, 1985) and affect-as-information theory (Schwarz, 1990), this paper formulates a theoretical framework to explore the relationships between cognitive appraisal, discrete emotions, and trust in the context of self-service technology adoption (Figure 1). The appraisals of technology usage outcome's desirability and causal agency are proposed to be the key determinants of discrete emotions toward using the technology, which in turn influence trust in the technology.

User's discrete emotion toward a self-service technology plays a central role in the proposed framework. It refers to a specific affective reaction or feeling toward using a self-service technology beyond positive and negative affect. According to the cognitive appraisal theory (Ellsworth and Smith, 1988; Frijda, 1993; Izard, 1992; Lazarus, 1991; Smith and Ellsworth, 1985), this paper suggests that discrete emotions toward using a self-service technology result from cognitive appraisals of technology usage outcome's desirability and causal agency. Hence, hypotheses 1-6 are proposed as follows.

Hypothesis 1: The appraisal of self-service technology usage outcomes as desirable, technology-caused will lead to a greater feeling of gratitude than feelings of other emotions (e.g., pride, happiness, anger, shame, and disappointment) toward using the technology.

Hypothesis 2: The appraisal of self-service technology usage outcomes as desirable, self-caused will lead to a greater feeling of pride than feelings of other emotions (e.g., gratitude, happiness, anger, shame, and disappointment) toward using the technology.

Hypothesis 3: The appraisal of self-service technology usage outcomes as desirable, circumstance-caused will lead to a greater feeling of happiness than feelings of other emotions (e.g., pride, gratitude, anger, shame, and disappointment) toward using the technology.

Hypothesis 4: The appraisal of self-service technology usage outcomes as undesirable, technology-caused will lead to a greater feeling of anger than feelings of other emotions (e.g., pride, gratitude, happiness, shame, and disappointment) toward using the technology.

Hypothesis 5: The appraisal of self-service technology usage outcomes as undesirable, self-caused will lead to a greater feeling of shame than feelings of other emotions (e.g., pride, gratitude, happiness, anger, and disappointment) toward using the technology.

Hypothesis 6: The appraisal of self-service technology usage outcomes as undesirable, circumstance-caused will lead to a greater feeling of disappointment than feelings of other emotions (e.g., pride, gratitude, happiness, anger, and shame) toward using the technology.

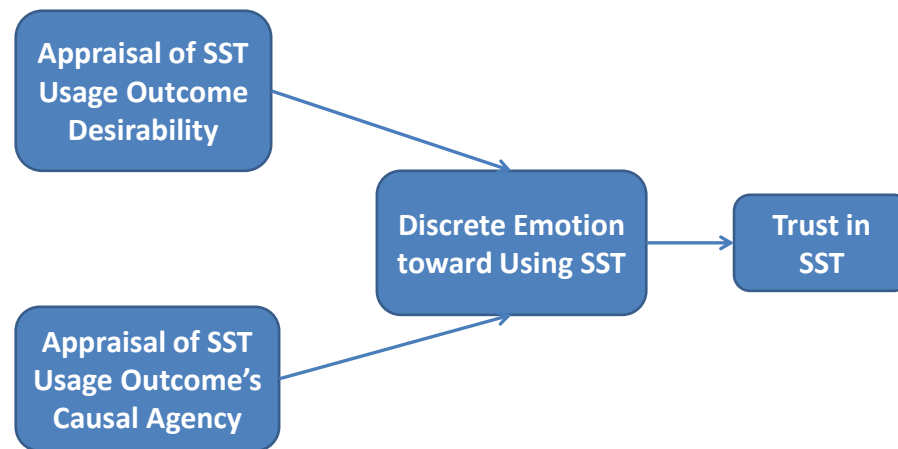


Figure 1. Research Model of Cognitive Appraisals of SST Usage Outcome's Desirability and Causal Agency, Discrete Emotion Toward using SST, and Trust in SST

Consistent with the affect-as-information theory (Schwarz, 1990), it is expected that emotions toward using a self-service technology will influence trust in the technology in the same direction of the emotion-evoking cognitive appraisals. Hence, hypotheses 7-8 are proposed below.

Hypothesis 7: Increased feeling of positive emotions (i.e., gratitude, pride, and happiness) resulting from appraising technology usage outcomes as desirable will increase trust in self-service technology.

Hypothesis 8: Increased feeling of negative emotions (i.e., anger, shame, and disappointment) resulting from appraising technology usage outcomes as undesirable will decrease trust in self-service technology.

The influence of emotions on trust is not limited only to the influence of valence. The appraisal of technology usage outcome's causal agency will cause the emotions of the same valence to have differential influences on trust in the technology. It is reasonable to expect that the emotions resulting from attributing the technology usage outcomes to the technology will have a greater influence on trust in the technology than emotions resulting from attributing the outcomes to self or general circumstances. This suggests hypotheses 9, 9a, and 9b as follows.

Hypothesis 9: The emotions resulting from appraising self-service technology usage outcomes as technology-caused will have a greater influence on trust in the technology than the same-valenced emotions resulting from appraising technology usage outcomes as self-caused or circumstance-caused.

Hypothesis 9a: Increased feeling of gratitude toward using self-service technology will increase trust in the technology more than increased feelings of pride or happiness.

Hypothesis 9b: Increased feeling of anger toward using self-service technology will decrease trust in the technology more than increased feelings of shame or disappointment.

RESEARCH DESIGN

This research will consist of two studies using two independent samples of participants. The first study will be an experimental vignette study that involves self-service technology usage scenarios leading to different user emotions. It will be a 2 x 3 between subject factorial design that manipulates the appraisals of technology usage outcome's desirability and

causal agency and measures their impacts on the emotions toward using the technology and trust in the technology. The respondents will be given different versions of similar vignettes, where sentences are inserted or removed to manipulate the factors under study (Wason, Polonsky and Hyman, 2002). The experimental study allows manipulation of the cognitive appraisal dimensions of interest while controlling possible effects of irrelevant factors, however it is limited in external validity.

The second study will be a critical incident survey (Daft, 1987) regarding respondents' past self-service technology usage experience. It is intended to enhance the external validity of the first experimental study. This study will employ a quasi-experimental field design, which asks respondents to recall a self-service technology usage situation that triggered a particular emotion of interest along with its related cognitive appraisals and consequence for trust in the technology.

The participants of these two studies will be college students from a southeastern university in the USA. They will voluntarily participate in this study in exchange for extra course credit. We will employ student participants for three reasons. First, given the large sample size required for this study, students provide an accessible sample. Second, since students represent a large population of self-service technology users, their emotional responses and trusting intention toward self-service technologies will provide valuable insight into the research questions of this research. Third, there is little reason to believe that student emotional response mechanisms will differ from those of other groups of people, since human emotions are generally regarded as basic physiological and mental states that result from collecting sensory information and transmitting it to cognitive and behavioral systems (Panksepp, 1992).

All of the measurement items will be adapted and revised from the reliable, validated measurement scales of the previous research. Smith and Ellsworth's (1985) measures of cognitive appraisal dimensions and emotions will be adopted to measure the cognitive appraisals of technology usage outcomes and discrete emotions toward using a self-service technology. The measurement scales of trust in a self-service technology will be adapted from McKnight, Kacmar and Choudhury's measure of trusting intention (2004).

EXPECTED CONTRIBUTIONS

The expected contributions of this paper are three-fold. First, this research provides a new framework to investigate the relationship between emotions and trust in technology. Prior IS research on the impact of emotions adopts the valence-based approach, which only focuses on the impact of overall positivity and negativity of different emotional experiences but ignores all the specific elements present in the different emotions of the same valence. This paper goes beyond mere valence of emotions and emphasizes the idiosyncratic elements of specific emotions. It proposes that the impact of emotions on trust in technology is better understood using a cognitive appraisal approach, which assumes different emotions of the same valence may have distinctive effects on trust. Second, this research places a strong focus on the causes of discrete emotions toward a self-service technology and their subsequent effects on trust in the technology. It advances our understanding of the influence of users' cognitive appraisals of technology usage outcomes on their emotions and trust in technology. Finally, the insights into the cognitive appraisals patterns underlying different emotional experiences during human-technology interaction can be used to formulate specific technology design goals to maximize trust in technology. Specifically, self-service technology can be designed with the intention to activate or prevent activation of certain cognitive appraisals. For example, designing a technology with the goal to elicit gratitude involves designing for desirable outcomes and other agency. Designing with the goal to prevent anger is designing to avoid undesirable outcomes and other agency.

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