TECHNOLOGY PARADOXES, EMOTIONAL AMBIVALENCE AND USE PATTERNS

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ABSTRACT

Due to the paradoxical nature of information technology (IT), technology users often find themselves confronted with both positive and negative aspects of technology usage (e.g., fulfills needs / creates needs, control / chaos, engaging / disengaging, empowerment / enslavement, freedom / dependence, assimilation / isolation, efficiency / inefficiency, competence / incompetence, and etc.), leading to conflicting evaluations of IT, mixed emotions toward IT, and distinct IT use patterns. This paper proposes a conceptual framework of the emotional and behavioral consequences of IT paradoxes. The framework suggests that technology users' individual differences (i.e., need for cognition, construal level, and tolerance for ambiguity) moderate their feelings of emotional ambivalence (the experience of different emotions of opposite valence) arising from IT paradoxes. Emotional ambivalence, depending on how its underlying opposing emotions are appraised – whether as threat or opportunity and as controllable or not, in turn leads to different coping strategies that then become reflected in certain technology use patterns. The framework also highlights the mediating role of emotional ambivalence in the relationship between IT paradoxes and technology use patterns.

Keywords: Technology Paradoxes, Individual Differences, Emotional Ambivalence, Cognitive Appraisals, Technology Use Patterns

INTRODUCTION

Nowadays, although information technology (IT) has become increasingly prevalent in all aspects of people's daily life, people often find their daily experiences with IT to be ambivalent (Johnson, Bardhi & Dunn, 2008). On the one hand, people enjoy the benefits of new IT; but on the other hand, they are often confused with the complex features of IT. Users' experiences with IT may be paradoxical (Jarvenpaa & Lang, 2005), characterized by conflicting emotions where users are confronted with both positive and negative aspects of technology usage. The notion of technology paradox is not new. In social science, Winner (1994) argues that the same technology that creates positive feelings of intelligence and efficacy can also elicit feelings of stupidity and ineptitude (Winner, 1994). In marketing research, Mick and Fournier describe eight central technology paradoxes – control/chaos, freedom/enslavement, new/obsolete, competence/incompetence, efficiency/inefficiency, fulfills/creates needs, and engaging/disengaging (Mick & Fournier, 1998). In information systems (IS) research, Orlikowski (1991) and Chinn (2001) discuss the paradoxical nature of IT. Jarvenpaa and Lang propose eight paradoxes of mobile technology – empowerment/enslavement, independence/dependence, fulfills/creates needs, competence/incompetence, planning/improvisation, engaging/disengaging, and public/private (Jarvenpaa & Lang, 2005).

IT paradoxes produce conflicting evaluations of IT and elicit mixed emotions (known as emotional ambivalence) toward IT (Mick & Fournier, 1998). Mixed emotions are conflicting emotions occurring simultaneously or sequentially. For example, mobile technology creates a sense of empowerment by enabling users to connect to others anywhere and anytime. However, by allowing others to be able to reach users 24/7 and making it harder for users to create and maintain personal space from others, it also creates a sense of enslavement. The conflict between empowerment and enslavement may give rise to conflicting feelings/emotions about mobile technology.

Emotions have been found to play an important role in IT use (Bagozzi, 2007; Beaudry & Pinsonneault, 2005; Beaudry & Pinsonneault, 2010; Deng & Poole, 2010; Gregor, Lin, Gedeon, Riaz & Zhu, 2014; Ortiz de Guinea & Markus, 2009; Stein, Newell, Wagner & Galliers, 2015; Yin, Bond & Zhang, 2014; Zhang, 2013). In technology acceptance research (e.g., Davis, 1989), the emotion concept has been incorporated in a few empirically validated extensions of technology acceptance model (Venkatesh, 2000). Although cognitive constructs are still the major theoretical considerations in studying IS (information systems) usage behaviors and emotions have generally been regarded as supplement to cognitive constructs, some recent research suggests that those constructs, such as perceived usefulness of IT, which have been once understood as purely cognitive, can be detected at the neuronal level in the brain areas normally associated with emotional activity (Dimoka, 2011; Dimoka, 2012). Prior IS research suggests that an IT event, such as implementation of new IT tools, elicits particular emotions in users depending on how the IT event is appraised – firstly, as an opportunity or a threat to the achievement of user's personal goal; and secondly, as controllable or uncontrollable by users (Bala & Venkatesh, 2016; Beaudry & Pinsonneault, 2010). Based on these two types of cognitive appraisals of the IT event, one of four classes of emotions may be triggered: challenge emotions, achievement emotions, deterrence emotions, or loss emotions (Beaudry & Pinsonneault, 2010). Beaudry and Pinsonneault (2010) also examined the impact of one exemplary emotion (excitement, happiness, anxiety, and anger) per class on IT use and revealed that emotions influence IT use directly or indirectly through their influence on adaptation behaviors or strategies (Beaudry & Pinsonneault, 2005; Beaudry & Pinsonneault, 2010). For example, happiness has a positive direct effect on IT use, whereas anger has a positive indirect effect on IT use through users' seeking social support. The behavior of seeking social support is part of a general disturbance handling strategy that helps to restore emotional stability and minimize perceived threat (Beaudry & Pinsonneault, 2005).

Although a number of studies were conducted to investigate the effects of uniform emotions on IT use, few of them examined the relationship between mixed emotions and IT use. Stein et al. (2015) found that while users respond to uniform emotions with clear adaptation strategies, they cope with mixed emotions by combining different adaptation behaviors. Due to the limited research on IT paradoxes, there is a lack of good understanding of the consequences of IT paradoxes. Recognizing the paradoxical nature of IT, this paper examines its unique characteristics and proposes a theoretical framework of the emotional and behavioral consequences of IT paradoxes. Integrating the technology paradox and mixed emotion research, cognitive appraisal and coping theories, and research on emotions and coping strategies in the IS field, the proposed framework focuses on the following research questions: How do IT paradoxes elicit emotional ambivalence in users? Who are likely to experience emotional ambivalence arising from IT paradoxes? How do users cope with emotional ambivalence in response to IT paradoxes? The framework suggests the moderating effects of IT users' individual differences on the impact of IT paradoxes on users'

feelings of emotional ambivalence as well as the mediating role of emotional ambivalence in the relationship between IT paradoxes and users' technology usage patterns.

THEORETICAL BACKGROUND

Paradoxes of Technology

"Paradox maintains that something is both X and not-X at the same time" (Mick & Fournier, 1998, p. 125). The idea of technology paradox has been noted in different disciplines. In marketing literature, Mick and Fournier (1998) indicate that consumers' response to technology is paradoxical and propose eight paradoxes of technology : control/chaos, freedom/enslavement, new/obsolete, competence/incompetence, efficiency/inefficiency, fulfills/creates needs, assimilation/isolation, and engaging/disengaging (P1-P8 shown in Table 1). They define these paradoxes around the idea that "polar opposite conditions can simultaneously exist, or at least can be potentiated, in the same thing" (Mick & Fournier, 1998, p. 124).

Table 1. Definitions of Technology Paradoxes Proposed by Mick and Fournier (1998), Jarvenpaa and Lang (2005) and Awad and Krishnan (2006)

Technology Paradox	Definition
P1: Control/Chaos	Technology can facilitate regulation or order, and technology can lead to upheaval or disorder.
P2: Freedom/Enslavement	Technology can facilitate independence or fewer restrictions, and technology can lead to dependence or more restrictions.
P3: New/Obsolete	New technologies provide the user with the most recently developed benefits of scientific knowledge, and new technologies are already or soon to be outmoded as they reach the marketplace.
P4: Competence/Incompetence	Technology can facilitate feelings of intelligence or efficacy, and technology can lead to feelings of ignorance and ineptitude.
P5: Efficiency/Inefficiency	Technology can facilitate less effort or time spent in certain activities, and technology can lead to more effort or time in certain activities.
P6: Fulfills/Creates Needs	Technology can facilitate the fulfillment of needs or desires, and technology can lead to development or awareness of needs or desires previously unrealized.
P7: Assimilation/Isolation	Technology can facilitate human togetherness, and technology can lead to human separation.

P8: Engaging/Disengaging	Technology can facilitate involvement, flow, or activity, and technology can lead to disconnection, disruption, or passivity.
P9: Independence/Dependence	Mobile technology enables users' connectivity independent of time and space, and mobile technology at the same time creates users' dependence on mobile technology for connectivity.
P10: Planning/Improvisation	Mobile technology can serve as an effective planning tool, and mobile technology allows users to make less preparation and improvise more.
P11: Public/Private	Mobile technology provides a personal tool for private communication, and mobile technology ends up generating more private calls in public areas and intefereing with others' privacy.
P12: Illusion/Disillusion	People may hold unrealistic expectations about mobile service performance fed by commercials and marketing. In practice, after using the new mobile devices, they may feel the service performance is quite inadequate and become disappointed about the mobile services.
P13: Personalization/Privacy	Data storage and processing technologies allow companies to provide personalized services tailored to individual customers based on knowledge about their preferences and behaviors. But personalization raises privacy concerns to customers about disclosing their personal information.

Adopted from Mick and Fournier (1998), Jarvenpaa and Lang (2005) and Awad and Krishnan (2006)

In the IS field, Jarvenpaa and Lang (2005) extend Mick and Fournier's work and suggest eight paradoxes of mobile technology: empowerment/enslavement, independence/dependence, fulfills/creates needs, competence/incompetence, planning/improvisation, engaging/disengaging, and public/private (Jarvenpaa & Lang, 2005). While some of Jarvenpaa and Lang's technology paradoxes overlap with Mick and Fournier's, they discover some paradoxes unique to mobile technology, such as independence/dependence, planning/improvisation, public/private, and illusion/disillusion paradoxes (P9-P12 shown in Table 1). The empowerment/enslavement paradox suggests that the ability to remain connected 24/7 afforded by mobile technology can lead to convenience and empowerment while simultaneously creating challenges of establishing and maintaining appropriate usage boundaries. Mobile technology allows individuals to be in contact with others virtually any time and anywhere. However, the same technology can cause an expectation that individuals must be in contact, regardless of the situation. The independence/dependence paradox considers that mobile technology enables users' connectivity

independent of time and space but at the same time it creates users' dependence on mobile technology for connectivity. The dependence on total connectivity coexists with the independence of time and space. With mobile technology, people get so used to being always connected independent of time and space that it's difficult for them to break the "always on" habit. The fulfills/creates needs paradox refers to the ability of mobile technology to facilitate the fulfillment of needs or desires versus its ability to promote the development or awareness of new needs or desires. On the one hand, mobile technology can help fulfill needs related to time constraints or location convenience, like the ability to offer location-based services. On the other hand, collecting individuals' location data creates a new need for privacy. The competence/incompetence paradox represents the ability of mobile technology to facilitate feelings of efficacy versus its ability to induce feelings of incompetence. Users of mobile technology acquire new competencies as they are able to do things anytime and anywhere. But these technology-enabled competencies tend to be limited in scope and may in turn cause incompetence at a higher level. For example, the new competence of being connected anytime and anywhere may disturb one's concentration and reduce one's ability to concentrate on one task at a time. The planning/improvisation paradox addresses the ability of mobile technology to serve as an effective planning tool for activities versus its ability to allow users to make less preparation and improvise more. Mobile technology enables efficient scheduling for better coordination and planning of work and social activities. As mobile technology makes it easier to plan on the spot, users can improvise social and work arrangements, updating flexibly and responding rapidly, with a minimum of forward planning or preparation required. However, too much improvisation may lead to disorganization and chaos. The engaging/disengaging paradox involves the ability of mobile technology to facilitate involvement, flow, or activity versus its ability to lead to disconnection, disruption, or passivity. Mobile technology allows users to engage in a wider variety of virtual communication activities. Yet mobile technology can also cause people to become less involved in and disengage from face-to-face activities, leading to detrimental family life and social interaction. The public/private paradox arises from having private communication in public spaces. Mobile technology provides a personal tool for private communication. However, freed from spatial and temporal constraints, private calls are increasingly made in public areas, where it is quite easy for other people to follow the complete conversation. This can interfere with one's privacy, create unwanted noise hindrance and disturb other people's activities. The illusion/disillusion paradox is concerned with whether users' expectations about mobile service performance are met when acquiring new mobile devices. People may hold unrealistic expectations about mobile service performance fed by commercials and marketing. But after using the new mobile devices, they may feel the service performance is quite inadequate and become disappointed about the mobile services. For example, mobile devices sometimes jam; batteries may run down quickly; video conversations are nearly impossible due to slow Internet connections, and etc.

Awad and Krishnan (2006) come up with personalization/privacy paradox (P13 shown in Table 1). Recent advances in data storage and processing technologies allow companies to have greater access to personal information about their customers and provide personalized services tailored to individual customers based on knowledge about their preferences and behaviors. However, personalization raises privacy concerns to customers about disclosing their personal information. Customers prefer to divulge as little information as possible because of the privacy invasion risk (Culnan & Bies, 2003; Sheng, Nah & Siau, 2008). As personalization benefits coincide with

privacy risk, consumers face a dilemma between seeking personalization benefits and avoiding privacy risks (Awad & Krishnan, 2006; Sutanto, Palme, Tan & Phang, 2013).

Emotions

Mixed Emotions

Lowrey and Otnes (1994) imply that mixed emotions are an outcome of experiencing paradox. Mixed emotions are also described as mixed feelings (Kahneman, 1992) or emotional ambivalence (Fong, 2006). Mixed emotions occur when an individual simultaneously experiences conflicting emotions, which involve holding both positive and negative emotional evaluations simultaneously. When the intrapsychic conflict of a technology paradox results in opposing emotional judgments about the technology, mixed emotions involving both positive and negative emotions will arise.

Traditionally, positive and negative emotions have been viewed as two opposite ends of a continuum and thus are considered to be negatively correlated or mutually exclusive (Russell, 1979). This view implies that people have limited ability to experience conflicting mixed emotions (Russell, 1980; Watson & Tellegen, 1985). However, more recent research suggests that individuals can simultaneously experience different emotions of opposite valence (Cacioppo, Gardner & Berntson, 1997). Positive affect and negative affect can be better represented as two independent constructs (Brehm & Miron, 2006) rather than diametric opposites of a continuum and have been found to activate different sections of the brain (Henriques & Davidson, 1990). Thus, it has been argued that individual's affect system is not constrained to a bipolar processing continuum, but rather it has a flexible structure integrating two separate systems with different operating characteristics for processing positivity and negativity (Norris, Gollan, Berntson & Cacioppo, 2011). Larsen, McGraw and Cacioppo (2001) suggest that mixed emotions are more likely to occur in situations containing both pleasant and unpleasant aspects. The experiences of mixed emotion have been found to occur in a variety of contexts, including the context of IT usage. Stein et al. (2015) argue that various cues within an IT event may interact and produce mixed affective responses in users. Thus, IT paradoxes can be considered complex stimuli involving conflicting cues that may elicit mixed emotions with opposing valences.

Emotions are subjective and differ depending on individual characteristics. The literature on emotions suggests that individual difference factors play important roles in the experience of emotions and subsequent behavioral responses (Krohne, 2003). Thus, individuals' experiences of mixed emotions in response to technology paradox may vary dependent on their individual difference factors. When an individual experiences certain IT paradoxes, he/she may feel mixed emotions with or without one dominant emotion. If the individual is able to resolve the conflicts arising from IT paradoxes, then one emotion will often be dominant over the other and attenuate the feeling of mixed emotions. If the individual is not able to resolve the conflicts and holds contradictory evaluations of IT, then intense mixed emotions may occur with no dominant emotion. In other words, to experience strong mixed emotions, the individual must be aware of the duality of the situation in which no dominant evaluation of IT exists, and they must feel internal friction and stress associated with emotional ambivalence. It is this recognition of an intrapsychic conflict that results in strong mixed emotions or emotional ambivalence. Thus, individual difference factors (i.e., need for cognition, construal level, and tolerance for ambiguity) that influence

individuals' ability to process information and handle conflicts may account for the extent of mixed emotions or emotional ambivalence that individuals experience as a result of IT paradoxes.

Cognitive Appraisal and Coping Theories

Since mixed emotions involve both pleasant and unpleasant feelings occurring simultaneously, they are ambiguous and complex, and thus cannot be explained by basic emotion theory or dimension theory. The Cognitive Appraisal Theory (CAT), which posits emotions as outcomes of different combinations of appraisals, provides an appropriate theoretical framework for understanding the occurrence of mixed emotions. The CAT 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 & 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 (Folkman & Moskowitz, 2004; Frijda, 1986; Lazarus, 1966; Lazarus, 1991; Lazarus & Folkman, 1984; Ortony et al., 1988; Roseman, 1984; Roseman, 1991; Scherer, 1988; Smith & Ellsworth, 1985).

Lazarus and Folkman (1984) proposes a two-stage cognitive appraisal process of emotions – primary appraisal and secondary appraisal. During primary appraisal, people evaluate the potential consequences of a particular event and its personal importance and relevance. During this stage, people ask the question of what is personally at stake in this situation. Some individuals may view the event as an opportunity for personal gain or growth, while others may regard the same event as a threat of potential loss or damage (Bhattacherjee, Davis, Connolly & Hikmet, 2017). During secondary appraisal, people assess what coping options are available to respond to the situation. They determine the level of control (high or low) they have over the event and what they feel they can do about it given the coping resources at their disposal. During this stage, people ask the question of what they can do about this situation.

Following cognitive appraisals, the individual engages in coping behaviors to deal with the emotion-eliciting event. Coping behaviors refer to "cognitive and behavioral efforts exerted to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person" (Lazarus & Folkman, 1984, p. 141). Internal demands arise from individuals' personal desires or expectations such as a need for achievement, accomplishment, or internalized performance standards, while external demands are imposed by the external environment, such as social pressure or job requirements. Internal and/or external demands will become disruptive events when exceeding one's resources to manage them. According to the coping theory, individuals engage in the specific coping behaviors that can best restore their personal well-being (Lazarus & Folkman, 1984). Appraisal is central to coping because it involves the assessment of the situation in terms of its expected consequences and personal significance and what can be done about it in light of the resources available at one's disposal. Appraisal influences people's coping responses that in turn influence situational outcomes (Kessler, 1998; Lazarus & Folkman, 1984; McRae, 1984). Folkman and Lazarus' stress and coping model (1988) suggests that people cope with their emotions mainly through two different types of strategies: problem-focused and emotion-focused coping strategies. The problem-focused coping strategy is directed at reducing demands from the external environment or increasing personal resources to meet external demands, while the emotion-focused coping strategy is focused on regulating or

controlling emotional responses to stressful situations. In general, if individuals appraise emotion-eliciting events as positive (primary appraisal) and/or when they feel they have control over the situations (secondary appraisal), they tend to employ problem-focused coping responses, for instance, by manipulating the external environment and/or changing themselves to cope with the demands from the environment (Lazarus & Folkman, 1984). The problem-focused coping may include planning, seeking information, using instrumental support, acquiring new skills or knowledge to handle the event, and etc. On the contrary, if the situations are perceived as negative or outside of the individuals' control, then emotion-focused coping behaviors tend to be more prevalent (Lazarus & Folkman, 1984). The emotion-focused coping involves altering one's perception and emotion about an event without affecting the emotion-eliciting situation at hand, based on the assumption that any attempt to change the external environment will likely be futile and only lead to more frustration and distress. Such coping strategy may include adjusting one's expectation of the event, wishful thinking in terms of maintaining hope and optimism that the event will be reversed, positive thinking in terms of selectively processing information about the event to make oneself feel better, seeking emotional support, emotional venting, being in denial, or withdrawing from or avoiding the event (Folkman, Lazarus, Dunkel-Schetter, Delongis & Gruen, 1986; Lazarus & Folkman, 1984). Coping research suggests that emotion-focused behaviors have traditionally been associated with suboptimal coping adjustments, while problem-focused behaviors have been linked to more positive results (Carver, Scheier & Weintraub, 1989; Causey & Dubow, 1992; Ebata & Moos, 1991; Endler & Parker, 1990). For example, while such emotion-focused behaviors as avoidance or withdrawal are potentially helpful for regulating emotional response, they are not likely to generate external positive outcomes.

Another well-known categorization of coping behaviors specifies the approach coping vs. the avoidance coping. Approach coping behaviors are oriented toward the sources of the emotional responses, while avoidance coping behaviors are oriented away from them (Roth & Cohen, 1986). Ebata and Moos (1991) describe the approach coping strategies as "cognitive attempts to change ways of thinking about the problem and behavioral attempts to resolve events by dealing directly with the problem or its aftermath" (Ebata & Moos, 1991, p. 34). In contrast, avoidance coping strategies are described as "cognitive attempts to deny or minimize threat, and behavioral attempts to get away from or avoid confronting the situation …" (Ebata and Moos, 1991, p. 34), and include avoidance/withdrawal or distancing.

Prior research has found that approach-oriented coping produces better adjustment outcomes than avoidance-oriented coping (Billings & Moos, 1981; Folkman & Lazarus, 1980). In the IS field, Beaudry and Pinsonneault (2005) make a similar argument based on their findings that IT users achieved improved performance benefits by engaging in approach-oriented behaviors such as deeper use of IT sparked by positive reappraisal of IT and that users who committed avoidance-oriented behaviors by minimizing their learning of IT and consequently engaging in superficial use of IT produced few performance benefits.

All problem-focused coping strategies are approach-oriented, because they involve the direct confrontation and management of the sources of emotions. However, the emotion-focused coping strategies can be either approach-oriented or avoidance-oriented. The approach-oriented emotion-focused coping such as seeking social support from others or reappraising the emotion-eliciting event in a positive light is generally considered as an adaptive emotion regulation strategy, whereas

the avoidance-oriented emotion-focused coping such as distancing from or avoiding the stress-evoking event is viewed as being maladaptive (Folkman & Lazarus, 1985; Holahan & Moos, 1987).

Emotions and Coping Strategies in IS Research

In IS Research, it has been suggested that individuals evaluate an IT event along two appraisal dimensions: first, to determine whether the new IT constitutes a threat or an opportunity to the achievement of individuals' personal goals (primary appraisal); and second, to assess the extent of control individuals have over the expected outcomes of IT implementation (secondary appraisal) (Beaudry & Pinsonneault, 2010). Depending on an individual's appraisals of IT event, he/she may experience one of four classes of emotions: challenge emotions (e.g., excitement, hope), triggered by appraisals of opportunity and high control; achievement emotions (e.g., happiness, relief), evoked by appraisals of opportunity and low control; deterrence emotions (anxiety, distress), activated by appraisals of threat and high control; and loss emotions (anger, frustration), aroused by appraisals of threat and low control (Beaudry & Pinsonneault, 2010).

Beaudry and Pinsonneault's coping model of user adaptation (CMUA) postulates four adaptation strategies (Beaudry & Pinsonneault, 2005) in response to IT event-elicited emotions. CMUA involves 3 stages. First, an IT user engages in primary appraisal as he/she assesses whether the IT event constitutes an opportunity or a threat. Second, the user engages in secondary appraisal by assessing his/her degree of control over his/her environment. And finally, based on the primary and secondary appraisals, the user engages in various adaptation behaviors to deal with the IT event. Such adaptation behaviors may be problem-focused or emotion-focused. The problem-focused adaptation behaviors are oriented toward modifying any of the three contextual elements related to IT usage: the IT-enabled work task (work adaptation), the individual IT user (self adaptation), or the IT itself (technology adaptation). In contrast, the emotion-focused adaptation behaviors are directed at only the IT user himself/herself and focus on restoring the user's internal emotional stability rather than changing the external environment. CMUA identifies four high-level coping strategies that are characterized by various combinations of problem-focused and emotion-focused adaptation behaviors in response to the emotional outcomes of primary and secondary appraisals: 1) benefits maximizing (e.g., taking full advantage of the opportunities offered by an IT to maximize personal benefits) in response to challenge emotions, 2) benefits satisficing (e.g., being satisfied with the limited benefits an IT offers) in response to achievement emotions, 3) disturbance handling (e.g., restoration of personal emotional stability and minimization of the perceived negative consequences associated with an IT) in response to deterrence emotions, and 4) self-preservation (e.g., restoration of emotional stability, with little or no impact on individuals' performance at work using an IT) in response to loss emotions (Beaudry & Pinsonneault, 2005; Beaudry & Pinsonneault, 2010). The first two strategies of benefits maximizing and benefits satisficing, are adopted when the individual views the IT event as an opportunity. Both strategies involve little or limited emotion-focused adaptation behaviors as there is no or little need for restoring emotional stability. If such an individual perceives himself/herself to have control over the work environment, he/she is likely to engage in problem-focused adaptation behaviors such as work adaptation, technology adaptation and self adaptation (Fadel, 2011) that allow him/her to derive maximum advantage from the functionalities/capabilities offered by the IT, which is termed as benefits maximizing. On the contrary, if the individual has little control over his/her work environment, he/she is likely to engage in limited problem-focused

or emotion-focused adaptation behaviors by employing the benefits satisficing strategy wherein he/she passively accepts the benefits offered by the IT without proactively adapting to it. The next two adaptation strategies of disturbance handling and self-preservation are employed when the individual views the IT event as a threat. If such an individual perceives himself/herself to have a high degree of control over his/her work environment, he/she will likely engage in both problem-focused adaption behaviors to mitigate the potential harm derived from the IT usage and emotion-focused adaptation behaviors to minimize perceived negative consequences and restore emotional stability. Such an adaptation strategy is termed as disturbance handling. In contrast, if the individual has limited control over his/her work environment, he/she may have to adopt the self-preservation strategy by relying solely on emotion-focused adaptation behaviors to restore emotional stability since there is very little he/she can do to alter his/her environment.

THEORETICAL FRAMEWORK AND PROPOSITIONS

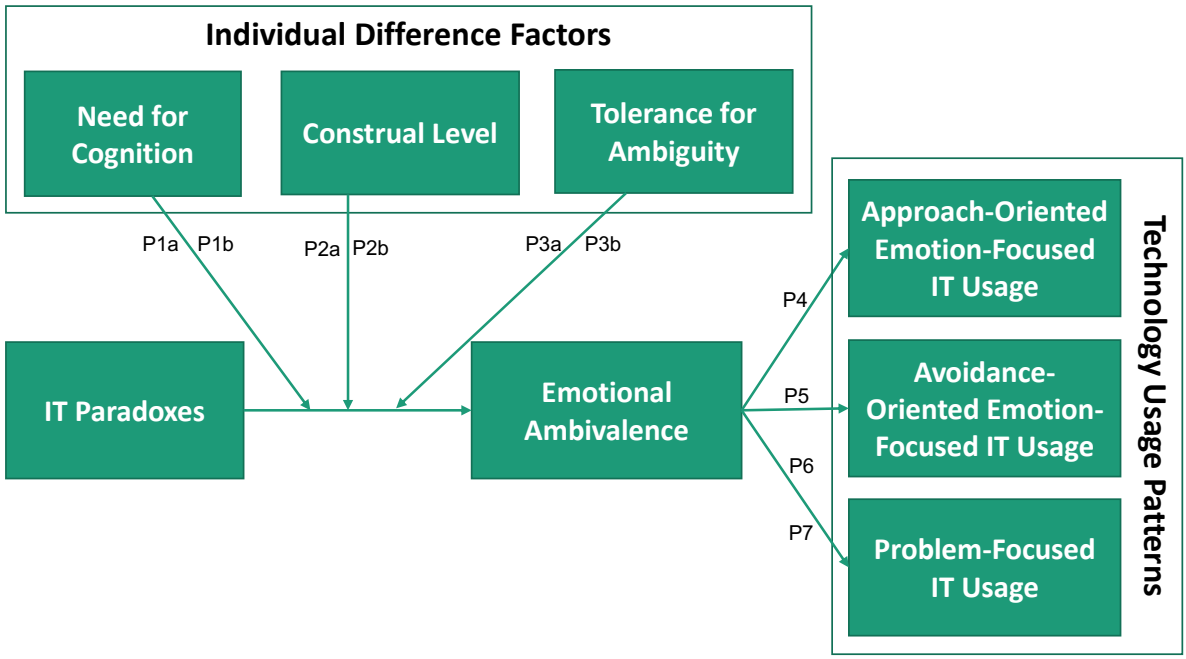
Drawing on the technology paradox and mixed emotion research, cognitive appraisal and coping theories, and research on emotions and coping strategies in the IS field, this paper proposes a theoretical framework of the emotional and behavioral consequences of IT paradoxes (Figure 1). The framework focuses on the moderating effects of IT users' individual differences (i.e., need for cognition, construal level, and tolerance for ambiguity) on the impact of IT paradoxes on users' feelings of emotional ambivalence as well as the mediating role of emotional ambivalence in the relationship between IT paradoxes and users' technology usage patterns (i.e., problem-focused IT usage behaviors, approach-oriented emotion-focused IT usage behaviors, and avoidance-oriented emotion-focused IT usage behaviors).

Due to the subjective nature of emotional experiences, IT paradoxes will lead to strong feelings of emotional ambivalence only if individuals perceive conflicts arising from IT paradoxes and hold contradictory evaluations of IT. The perceptions of conflicts are formed through continuous sense making and involve the development of multiple perspectives, which are related to individuals' information-processing abilities. One individual difference factor influencing one's information-processing ability is need for cognition, which is defined as an individual's "tendency to engage in and enjoy effortful cognitive endeavors" (Cacioppo, Petty & Kao, 1984, p. 48). Individuals who are high in need for cognition are naturally inclined to engage in deep reflection and "seek, acquire, think about, and reflect back on information to make sense of stimuli, relationships and events in their world" (Cacioppo, Petty, Feinstein & Jarvis, 1996, p. 198). In contrast, individuals low in need for cognition do not enjoy thinking and try to avoid unnecessary thought activity. Hence, they are less likely to use cognitive elaboration when processing information and are more likely to engage in effort-reducing heuristics (Dole & Sinatra, 1998; Nowlis, Kahn & Dhar, 2002). Therefore, the IT users low in need for cognition are more likely to rely on simple cues and stereotypes when making judgments about IT (Haugtvedt, Petty & Cacioppo, 1992), whereas those high in need for cognition are more likely to fully consider all relevant information about IT usage. This study proposes that a stronger need to cognitively engage in IT usage events will make individuals more likely to engage in deep reflection about the impacts of IT usage and make conflicting evaluations about IT. Thus, the need for cognition moderates the relationship between IT paradoxes and emotional ambivalence, and the following propositions are suggested.

Proposition 1a: Individuals that are high in need for cognition are more likely to experience emotional ambivalence from IT paradoxes.

Proposition 1b: Individuals that are low in need for cognition are less likely to experience emotional ambivalence from IT paradoxes.

Figure 1. Theoretical Framework of IT Paradoxes, Emotional Ambivalence and Usage Patterns



Another individual difference factor affecting people's information-processing ability is construal level. The construal level theory (CLT) posits that people may construe information in memory at an abstract, high level or at a concrete, low level (Trope & Liberman, 2003). High level construals are superordinate and decontextualized, and thus lead to a more generalized understanding of actions and events. Conversely, low-level construals are subordinate and contextualized, reflecting a focus on the details or specifics of actions and events. It has been suggested that people who organize conflicting ideas at a decontextualized superordinate level process the ideas more inclusively, thus rendering them less conflicting and more coherent (Abelson, 1959). Therefore, people with a high-level construal use fewer and broader categories to classify different stimuli than those with a low-level construal (Liberman, Sagristano & Trope, 2002). Thus, I argue that the tendency of IT users with high level construals to process conflicting cues of IT more inclusively may lead them to more likely resolve the conflicts arising from IT paradoxes and hence experience less mixed emotion/emotional ambivalence. This suggests the moderating role of contrual level in the relationship between IT paradoxes and emotional ambivalence and leads to the following propositions.

Proposition 2a: Individuals that are high in construal level are less likely to experience emotional ambivalence from IT paradoxes.

> Proposition 2b: Individuals that are low in construal level are more likely to experience emotional ambivalence from IT paradoxes.

Tolerance for ambiguity, an individual's ability to process and interpret vague or unstructured information, is another individual difference factor relevant for people's information-processing ability. Tolerance for ambiguity specifically pertains to the manner in which an individual perceives and processes information about ambiguous or unfamiliar situations (Furnham & Ribchester, 1995). Individuals who are low in tolerance for ambiguity try to avoid or quickly stop processing paradoxical information (Vernon, 1970) and thus are more likely to perceive ambiguous situations as strictly black or white (Bhushan & Amal, 1986). On the contrary, people with a high tolerance for ambiguity continuously seek all relevant information about the ambiguous situations and make judgements based on a larger set of information (Grenier, Barrette & Ladouceur, 2005; Vernon, 1970) than those with a low tolerance for ambiguity. Therefore, IT users high in tolerance for ambiguity are more likely to recognize conflicting cues arising from IT paradoxes. So, tolearance for ambiguity has a moderating effect on the relationship between IT paradoxes and emotional ambivalence. And the following propositions are suggested.

> Proposition 3a: Individuals that are high in tolerance for ambiguity are more likely to experience emotional ambivalence from IT paradoxes.

> Proposition 3b: Individuals that are low in tolerance for ambiguity are less likely to experience emotional ambivalence from IT paradoxes.

Emotional ambivalence results from a primary appraisal involving both opportunity and threat elements. On the one hand, such an appraisal evokes feelings of stress and anxiety; and on the other hand, it may be characterized by positive feelings such as hope, eagerness or enjoyment. For example, an IT user may enjoy the IT benefits in improving his/her efficiency in task performance while simultaneously feeling a degree of stress associated with devoting more time and effort troubleshooting the system. In such a situation, if IT users perceive a high control over the situation, they tend to proactively cope with the situation and engage in both problem-focused and approach-oriented emotion-focused IT usage behaviors. This argument is in line with Stein et al.'s observation that IT users cope with mixed emotions by combining different adaptation behaviors (Stein et al., 2015). Problem-focused IT usage behaviors involve adapting the work processes to fit with the technology (work adaptation), modifying the functionalities or features of IT to support one's work (technology adaptation) or improving one's ability, skills and knowledge to use the technology (self adaptation) (Fadel, 2011); while approach-oriented emotion-focused IT usage behaviors include seeking social support and undertaking positive reappraisal of IT (Fadel, 2011). In contrast, if users have little or no control over the situation, they may undertake little problem-focused behavior and are likely to engage in avoidance-oriented emotion-focused IT usage behaviors, such as wishful thing, avoiding and distancing from the technology, because little can be done to change the situation. Hence, the following are proposed:

> Proposition 4: The experience of emotional ambivalence toward IT along with the appraisal of having high control over IT use will be positively associated with approach-oriented emotion-focused IT usage behaviors (e.g., seeking social support and positive reappraisal).

Proposition 5: The experience of emotional ambivalence toward IT along with the appraisal of having low control over IT use will be positively associated with avoidance-oriented emotion-focused IT usage behaviors (e.g., avoidance, wishful thinking and distancing).

Proposition 6: The experience of emotional ambivalence toward IT along with the appraisal of having high control over IT use will be positively associated with problem-focused IT usage behaviors (e.g., work adaptation, technology adaptation and self adaptation).

Proposition 7: The experience of emotional ambivalence toward IT along with the appraisal of having low control over IT use will be negatively associated with problem-focused IT usage behaviors.

RESEARCH DESIGN

Sample and Data Collection

To test the proposed research model and its associated propositions, a web-based survey will be conducted to investigate the presence of paradoxes associated with the use of smartphones and their emotional and behavioral consequences for the smartphone users. The participants for this study will be the faculty, staff and students at a southeast university in the USA. To solicit participation, an email invitation will be sent to all faculty, staff and students at the university. Interested participants may click on the link in the email invitation to be directed to the survey website. A screening question will be included at the beginning of the survey to determine whether the respondent has used a smartphone. The survey website will be designed in such a way that only those who have used smartphones will be able to proceed with the survey. To encourage participation, prizes (Amazon.com Gift Cards) will be provided by means of a lucky draw. The survey will not reveal the research purpose of identifying the presence of technology paradoxes to the participants. Instead, it will merely mention that the study addresses the use of smartphones. Respondents will be asked to respond to all survey questions related to the presence of technology paradoxes, their needs for cognition, construal levels, tolerance for ambiguity, feelings of emotional ambivalence toward smartphones, perceived levels of control over smartphones, smartphone usage behaviors, and etc.

Since data will be collected from a sample of university faculty, staff and students, the results of the proposed study may not be applicable to other populations. However, all university faculty, staff and students are smartphone users, and the proposed study is designed to study their emotional and behavioral responses that are considered primitive and instinctive for all human beings, the use of faculty, staff and student sample should not present a serious threat to the validity of this study.

Measures

The survey instrument will be developed by incorporating and adapting existing valid and reliable scales where appropriate. The measurement scales of IT paradoxes will be developed to capture the presence of the technological paradoxes identified by Mick and Fournier (1988), Jarvenpaa and Lang (2005) and Awad and Krishnan (2006). For each IT paradox, two questions representing

the antagonism associated with that paradox will be asked. All the questions related to IT paradoxes will be interspersed in such a way that the opposing evaluations relating to a certain paradox would not be placed together or in close proximity, in order to disguise the purpose of the research. Furthermore, during the data collection process, the word paradox will not be used nor will any other term that may suggest the participants should tell their paradoxical or ambiguous experiences arising from the use of smartphones. The individual difference variables will be measured using the need for cognition scale (Ailawadi, Neslin & Gedenk, 2001), the behavioral identification scale for construal level (Vallacher & Wegner, 1989), and the tolerance for ambiguity scale (McLain, 1993). The measurement scale of perceived control over technology will be adapted from the work of Major et al. (Major et al., 1998). The emotional ambivalence will be measured using the bivariate evaluations and ambivalence measures (Cacioppo, Gardner & Berntson, 1997). The measurement scales of different IT usage behaviors – problem-focused IT usage behaviors, approach-oriented emotion-focused IT usage behaviors and avoidance-oriented emotion-focused IT usage behaviors will be adopted from Fadel's work (Fadel, 2011). Additionally, the participants' age and prior experience with smartphones will be measured as control variables.

ANTICIPATED OUTCOMES AND IMPLICATIONS

This study proposes a theoretical framework of the emotional and behavioral consequences of IT paradoxes. Drawing on the technology paradox and mixed emotion research, cognitive appraisal and coping theories, and IS research on emotions and coping strategies, the framework suggests that IT users' individual differences (need for cognition, construal level and tolerance for ambiguity) moderate the impact of IT paradoxes on users' feeling of emotional ambivalence which in turn mediates the relationship between IT paradoxes and people's IT usage behaviors. Previous IS research on emotions has primarily examined the antecedents of uniform emotions and their effects on IT adaptation behaviors (Beaudry & Pinsonneault, 2005, Beaudry & Pinsonneault, 2010). However, there is a lack of research investigating the role of mixed emotions in IT usage. This research further expands beyond the existing IS research on emotions in examining the relationship between mixed emotions/emotional ambivalence and IT usage behaviors. This paper also provides guidance to better predict and influence IT users' technology usage behaviors from the experience of IT paradoxes. For example, when a user experiences emotional ambivalence toward IT, improving his/her perceived control over IT through providing technical support, training and education may lead him/her to engage in approach-oriented emotion-focused and problem-focused IT usage behaviors.

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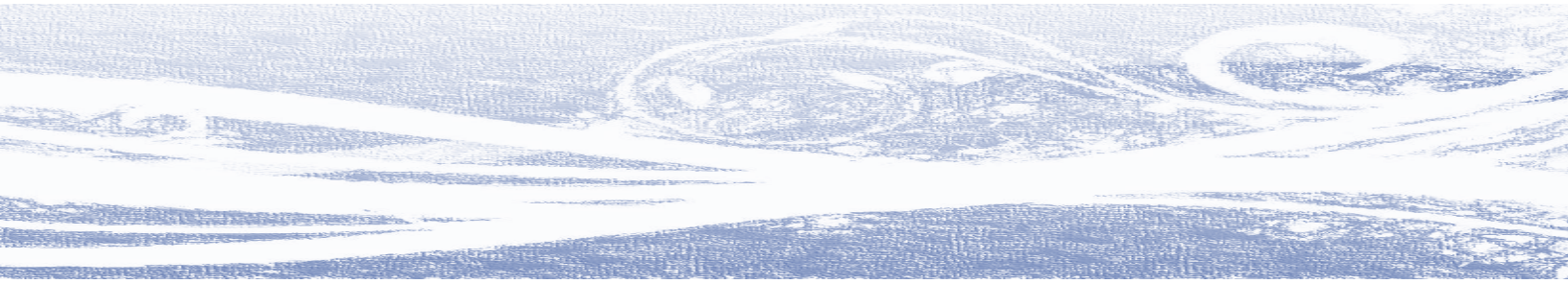

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