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Yuan Li

Columbia College, yli@columbiasc.edu

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INFORMATION TECHNOLOGY ATTACHMENT AND CONTINUANCE

Yuan Li, Division of Business, Mathematics and Sciences, Columbia College, Columbia, S.C., U.S.A., yli@columbiasc.edu

Abstract

An important task in Information Systems research is to understand factors that influence the continuous use of information technology (IT). This study extends the literature by conceptualizing a construct called IT attachment to explain the phenomenon. Drawing upon the attachment theory in developmental and social psychology, it suggests that IT attachment, defined as an affective bond of the IT users to IT, is a determinant of the users' satisfaction with IT and its continuance intention. Factors that influence the development of IT attachment are also analyzed, including IT confirmation, perceived usefulness, perceived ease of use, and IT playfulness.

Keywords: Attachment theory, information technology attachment, IT continuance, expectation-confirmation model.

1 INTRODUCTION

An important task in Information Systems (IS) research is to understand factors that influence the continuous use of information technology (IT) and IT-based services such as e-commerce and social networking sites (Bhattacharjee 2001a; Kim 2011; Ko 2013; Lin et al. 2012; Thong et al. 2006). Correspondingly, theoretical frameworks and constructs are developed or applied to examine IT continuance (Bhattacharjee 2001b; Hong et al. 2006; Kim & Malhotra 2005). These frameworks or constructs deal with the conscious intentions (based on a rational decision-making process from prior use experience), emotions (such as satisfaction), and habits of IT continuance (Ortiz de Guinea & Markus 2009). Nevertheless, as Ortiz de Guinea and Markus notice, the literature overemphasizes the roles of conscious intentions but the importance of emotions and habits, although recognized, have not been sufficiently analyzed. To them, emotions may drive continuing IT use directly (without contributing to the conscious intentions), and the habitual use of IT may be more extensive than simple repetitions of learned behavior; in addition, IT itself may be the most important trigger of automatic IT use (Ortiz de Guinea & Markus 2009, p. 438). They call for research on emotions and habits in IT continuance.

In this study, I respond to the above call by examining the emotional aspect of IT use and studying how it influences IT continuance. Drawing upon the attachment theory in developmental and social psychology (Dykas & Cassidy 2011; Peluso et al. 2004; Shaver & Mikulincer 2010), I suggest that IT users would develop an affective bond (called attachment) with IT through prior use experience, and the affective bond would trigger continuous use of IT in the future. As prior literature examined several instances of user-IT attachment (Goel et al. 2011; Jenkins-Guarnieri et al. 2012; Kim et al. 2013; Lee 2013; Ren et al. 2012; VanMeter & Grisaffe 2013), for consistency purpose, I call it IT attachment, since IT is a key attachment figure in the relationship. I suggest that in order to fully understand IT attachment, we need to treat IT as a social actor (Stein et al. 2013) that is able to arouse emotions of the users, and such emotions will determine a number of psychological and behavioral consequences such as IT satisfaction and IT continuance.

In the following sections, I first provide an overview of the attachment theory and discuss its applications in organizational, behavioral, and IS research. Then I conceptualize the IT attachment construct and discuss its impact on IT continuance. I also examine several antecedent factors of IT attachment. Finally, the implications of the construct for further research are briefly discussed.

2 ATTACHMENT THEORY: AN OVERVIEW

Grounded in the field of developmental psychology (Bowlby 1973), the attachment theory posits that individuals are born with innate behaviors that function to attract and maintain proximity to attachment figures (e.g., the caregivers) to protect against psychological and physical threats when the individuals are in distress (Mikulincer & Shaver 2005; Richards & Schat 2011). The theory was originally developed to explain the emotional and social development of infants, in which the infants develop relationships (called attachment) with primary caregivers (such as the parents) and such relationships influence their personality and behavior in later life stages such as adolescence and adulthood (Dykas & Cassidy 2011). For example, an infant with a secure relationship with parents is more likely to become socially competent than an insecure infant. The theory was later on adopted in research on adult behavior.

As the measures of attachment, several attachment styles (or patterns) have been developed and examined for their impacts on individual behavior. Four attachment patterns appeared in early literature, including secure attachment, anxious-avoidant attachment, anxious-resistant (or ambivalent) attachment, and disorganized (or disoriented) attachment; of these patterns, the last three are insecure types and are associated with distress (Peluso et al. 2004). Recently, researchers put focus on two main dimensions of

attachment, including anxiety and avoidance (Peluso et al. 2009; Richards & Schat 2011). The first dimension, attachment anxiety, reflects the degree to which a person worries that a partner will not be available or adequately responsive in times of need. The second dimension, attachment avoidance, reflects the extent to which a person distrusts his or her relationship partners' goodwill and strives to maintain autonomy and emotional distance from the partner. People who score low on both dimensions are considered secure in attachment, or securely attached (Davidovitz et al. 2007). This two-dimensional measure of attachment gained popularity in further research (Almakias & Weiss 2012; Davidovitz et al. 2007; Wright et al. 2014). It differs from the four-pattern typology in that it focuses on the degree (or quantity) of attachment while the latter focuses on its organizations or kinds. Richard and Schat (2011) show that attachment anxiety and avoidance have negative impacts on personality traits (such as emotional stability, extraversion, and agreeableness) and organizational citizenship behavior and positive impacts on intention to quit a job.

A very important factor that determines the development of attachment is the attachment figure, interpreted as a secure base from which a person can explore the world (Bretherton 1992). The attachment figure is not necessarily a human being (such as a parent or a leader) but can also be a group, an institution, an object, a place, and even a symbolic personage such as God (Davidovitz et al. 2007; Lewicka 2011; Morgan 2010; Tzou & Lu 2009). Bowlby (1973; also see Richards & Schat 2011) suggests that different attachments arise from early experiences of the availability and responsiveness of attachment figures: if a caregiver responds to the infant's needs promptly and appropriately (neither too much nor too little), a secure parental attachment can be formed; on the other hand, if the caregiver responds too much (over care) or too little (less care), then anxious-avoidant attachment would be developed. In addition to the psychological and social processes, the neurobiological process also plays a role in attachment development, as the infant relies on the sensory organs to collect and process information (Morgan 2010; Shaver & Mikulincer 2010). Once the attachment is established, it may be sustained via the mere existence of the attachment figure. It should be noted that a person may develop multiple attachments in the same environment, each corresponding to an attachment figure (Paulssen 2009).

2.1 Attachment theory in organizational and behavioral research

Attachment exists not only in infants but also in adults, and therefore the attachment theory is applied in organizational and behavioral research to examine interpersonal relationships and their impacts on human behavior (Richards & Schat 2011). An example is the study on leader-follower relationship, called leader-follower attachment (Davidovitz et al. 2007; Keller & Cacioppe 2001). Based on the typology of attachments, Keller and Cacioppe (2001) explore the attachment styles of leaders and followers and examine how they match or mismatch. For instance, they argue that a secure leader trying to build a relationship with an anxious-ambivalent follower may become overwhelmed with the follower's incessant need for attention and reassurance of worth, and therefore may come to view this follower as a burden and withdraw further emotional support; likewise, a secure leader trying to build a relationship with an avoidant follower may become frustrated by the follower's cool self-reliance and therefore may intensify his or her efforts to win over this follower. They assert that understanding leaders' and followers' attachment styles helps to understand their expectations and improve leadership performance; unfortunately, they did not empirically test the assertions. Davidovitz et al (2007) then examine the impact of leaders' attachment style on leadership-related mental representations and followers' performance and mental health. They find that leaders' attachment anxiety is associated with more self-serving leadership motives and poorer leadership qualities in task-oriented situations, and attachment anxiety also predicted followers' poorer instrumental functioning; leaders' attachment avoidance is negatively associated with pro-social motives to lead, with the failure to act as a security provider, and with followers' poorer socio-emotional functioning and poorer long-range mental health. In other words, leaders' attachment styles influence followers' psychological status and behavioral outcomes.

Paulssen (2009) studies the impact of customers' attachment orientations on business-to-business relationships. He finds that customers who are securely attached in their personal relationships experience higher levels of satisfaction, trust, and repurchase intent in their business-to-business relationships; meanwhile, their business attachment orientations, measured by security and closeness, also positively influence satisfaction, trust, and repurchase intent. The attachment theory is also applied to study academic and career self-efficacy in students. As Wright et al (2014) find, students who are more securely attached perceive greater social supports and fewer career barriers and have higher self-efficacy in both academic and career domains. In their study, the attachment was measured with two dimensions, attachment anxiety and attachment avoidance. Using the same two dimensions, Almakias and Weiss (2012) study the impact of attachment style on ultimatum game behavior (i.e., negotiations). They find that anxiously attached proposers make high offers to responders in order to avoid the rejection of the offers, and those proposers also show a tendency to accept more offers in order to be appreciated; on the other hand, avoidant players make low offers as a protection from getting hurt of being rejected.

Overall, the above studies highlight the values of attachment theory is examining interpersonal relationships and their impacts on psychological and behavioral consequences. This theory has been recently applied in IS research, summarized as follows.

2.2 Attachment theory in IS research

The attachment theory is adopted in the IS literature to address IT use. For example, in a study on online community success, Ren et al (2012) examine the development of group membership attachment in the online community, which resides at two levels: bond-based attachment to individuals in the community, and identity-based attachment to the group in the community. They show that the membership attachment drives the willingness to help the group, participations, retention, and willingness to help individual members in the community. A couple of studies then examine the impact of attachment styles on the use of social networking sites (SNS). First, Jenkins-Guarnieri et al (2012) find that of the two attachment styles, attachment avoidance has a negative impact on interpersonal competency of emotional support in Facebook, and attachment anxiety has a negative impact on initiating relationships in Facebook; interestingly, none of the attachment styles is associated with Facebook use. The second study addresses the building of social capital in SNS, as Lee (2013) finds that avoidance attachment is a negative predictor of social capital, and social capital of the subjects appears to be greatest under conditions of low anxiety attachment coupled with low avoidance attachment. In both studies, attachment styles are treated as personality traits as the attachment figures are not necessarily related to the SNS.

While the above organizational and IS studies all use human beings (either individuals or groups) as attachment figures, others have used alternative types of attachment figures. In a study on fashion technology acceptance, for example, Tzou and Lu (2009) examine the roles of brand attachment. They argue that brand attachment is created after a consumer becomes aware of the brand, perceives the brand to be attractive, feels confident about the brand, and then takes the brand into account at the time of purchase. They find that brand attachment has a positive impact on ergonomic and aesthetic perceptions of the fashion technologies, and aesthetic facet is the vital determinant to acceptance intention; interestingly, perceived usefulness and perceived ease of use of the technologies, although being influenced by brand attachment, do not predict intentions to use. In another study on users' intentions to return to virtual worlds (such as Second Life), Goel et al (2011) suggest that the intentions are triggered by users' perception of the virtual world as a place in which they have meaningful experiences, and such perception is called place attachment. They show that place attachment, operationalized as cognitive absorption in the virtual world, is driven by social awareness, location awareness, and task awareness.

A couple of studies start to examine the attachment between IT and users. First, Kim et al (2013) examine smartphone user attachment to mobile applications and its antecedents and consequences. They find that self-connection and social connection of smartphone users have a strong impact on smartphone application attachment, which in turn influences the word-of-mouth for the application, self-efficacy, and

also life satisfaction. In the second study, Choi (2013) adopts the brand attachment concept (Park et al. 2010) to the IS domain to exam the attachment to web browser. They find that visual aesthetics, personalization and relative performance have positive impacts on the attachment to the browser, which then positively influences online community participation intention of the users.

While the above studies adopted the attachment theory to address IT use, there are a number of limitations. First, the attachment construct is either devoid of the IT artifacts (such as online community group attachment, brand attachment, place attachment, and attachment styles of SNS users) or is too narrow in scope (such as mobile application attachment and attachment to web browser). A generalizable IT attachment construct has not been proposed. Second, factors that influence the development of IT attachment have not been sufficiently analyzed, leaving questions of how to moderate IT attachment. Third and most importantly, the impact of IT attachment on IT continuance is not sufficiently analyzed. In the next section, I introduce the IT attachment construct to address the issues.

3 IT ATTACHMENT: A CONCEPTUALIZATION

3.1. Development of the concept

As the above introduction implies, there are three indispensable elements in an attachment relationship: the subject, the attachment figure, and the attachment of the subject to the attachment figure. In this study, of course, the subject is the IT user, and the attachment figure is the IT artifact. Importantly, to understand the long-term relationship between IT and users, it is necessary to move beyond a technical view of IT and treat it as an actor in the social network with users (Stein et al. 2013). This is because the IT artifact can provide benefits that are comparable to those provided by a human caregiver: it can provide emotional – such as satisfaction (Bhattacharjee 2001b) – and instrumental resources to the users; it can support their creativity, initiative, and autonomy, such as personal innovativeness in IT (Agarwal & Prasad 1998); it can enhance their self-efficacy and support their desires to take on new challenges and acquire new skills (Couse & Chen 2010); and it can encourage their personal growth (Davidovitz et al. 2007). Some evidences were found in the use of tablet computers by young children (Couse & Chen 2010). These benefits or consequences of IT attachment will be discussed later in this section. In short, the IT artifact can be a responsive caregiver that provides users a platform for personal growth and development (Davidovitz et al. 2007).

The third element, which is at the core of the study, is the attachment of the IT users to IT. Although examples such as mobile applications attachment were discussed in literature, it is still worth to verify whether the attachment theory is applicable to the user-IT relationship. Generally speaking, an attachment relationship must fulfill three criteria (Davidovitz et al. 2007): maintenance of proximity (i.e., the subject is near an attachment figure, especially in times of stress or need), provision of a safe haven (i.e., an attachment figure can relieve the subject's distress and provide comfort, encouragement, and support), and provision of a secure base (i.e., an attachment figure sustains a subject's exploration, risk taking, and self-development). Explained in another way, the proximity criterion suggests that the subject must be able to feel the existence of the attachment figure, especially when needed; the safe-haven criterion suggests that the attachment figure must be able to respond to the need of the subject and provide relief and comfort when needed, which addresses the problem of attachment avoidance (i.e., isolation); and finally, the secure-base criterion suggests that the subject must feel comfortable to leave the attachment figure and explore unknown areas, which addresses the problem of attachment anxiety (i.e., clinginess). Apparently the user-IT relationship conforms to the first criterion, since IT has become a ubiquitous technology that is readily available to users. The second criterion is also met, since a positive experience with IT (i.e., confirmation) can result in enjoyment (Thong et al. 2006) and intimacy (Lee & Kwon 2011) with IT, which contribute to a good feeling with IT. For the third criterion, studies on personal

innovativeness of IT suggest that people who are confident with their IT skills are willing to explore new use of IT (Agarwal & Prasad 1998). Therefore, we conclude that IT attachment exists in IT-user relationship.

Similar to other types of attachment relationships (Davidovitz et al. 2007), I suggest that the IT attachment construct consists of two dimensions: IT attachment anxiety and IT attachment avoidance. IT attachment anxiety refers to the situation that the user feels uncomfortable without IT, or the fear of separation from IT. This happens when IT use is fun and playful, and it becomes habitual and autonomous (Ortiz de Guinea & Markus 2009). IT attachment avoidance refers to the situation that the user feels unconformable with IT. This happens when the use of IT is frustrating and uncertain, so that the user tries to avoid IT. Apparently, the two dimensions are opposite to attachment, and some scholars tend to use “attachment insecurity” to describe the construct it measures (Davidovitz et al. 2007). In other words, a secured IT attachment means low IT attachment anxiety and low IT attachment avoidance. The conceptual structure of the construct is shown in Figure 1.

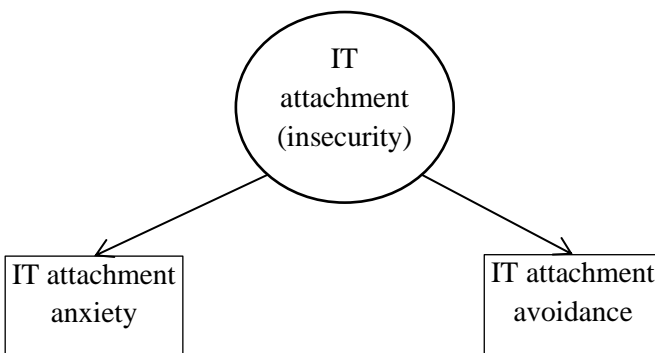


Figure 1. Conceptual structure of IT attachment

It should be noted that IT attachment anxiety is different from computer anxiety, as the latter refers to the anxiety about the implications of computer use such as the loss of important data or fear of other possible mistakes (Sievert et al. 1988; Thatcher & Perrewé 2002). Such a negative feeling or experience with IT suggests that computer anxiety may be associated with IT attachment avoidance. In addition, how IT attachment relates to technology addiction should also be investigated. Turel et al. (2011) define technology addiction as a psychological state of maladaptive dependency on the use of a technology to such a degree that typical behavioral addiction symptoms, such as negative emotions caused by withdrawal, arise. The definition implies that technology addiction may be associated with IT attachment anxiety; their specific relationship should therefore be investigated as well.

It should also be noted that IT attachment, like other psychological phenomena such as computer playfulness (Webster & Martocchio 1992), may be analyzed as either a trait or a state. A trait refers to a comparatively stable characteristic of individuals that is relatively invariant to situational stimuli; a state, on the other hand, refers to an affective or cognitive episode that is experienced in the short run and fluctuates over time (Webster & Martocchio 1992, p.203). While the conceptualization of IT attachment does not exclude its being analyzed as a personal state at a particular point of time or in a given context, such as the attachment to specific IT artifact (mobile device, web browser, SNS, etc.), the current study focuses on its relatively stable aspect and treats it as a personal difference factor that encompasses a person’s overall experience with IT and guides his/her future use of IT across contexts.

3.2. The influence of IT attachment on IT continuance

For the rest of the section, I discuss the impact of IT attachment on IT continuance intentions, and also the impacts of several antecedents on IT attachment. Their relationships are illustrated in Figure 2.

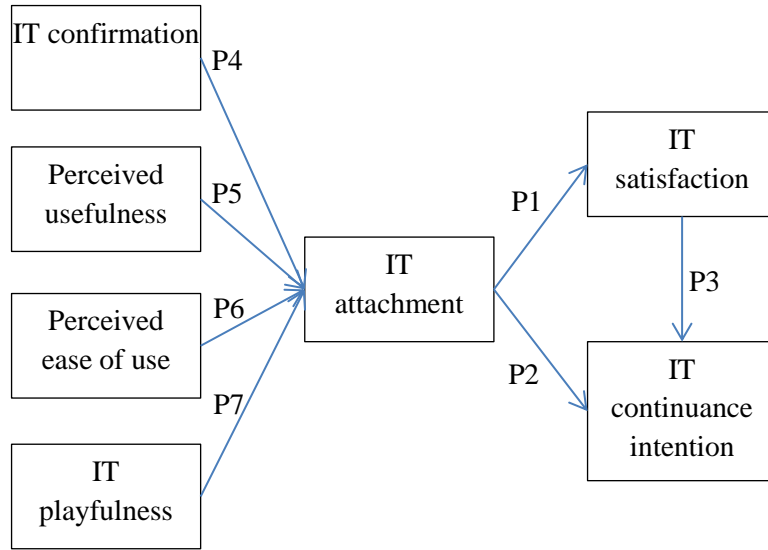


Figure 2. Antecedents and consequences of IT attachment

There are a number of psychological and behavioral consequences of IT attachment. In this study, I focus on IT continuance intentions. As mentioned in the beginning section, a critical topic in IS research is to understand factors that influence the continuous use of IT. A popular framework is the expectation-confirmation model of IT continuance (ECM-IT), which consists of three antecedents of continuous intentions: IT confirmation, perceived usefulness (PU) of IT, and IT satisfaction (Bhattacharjee 2001b). Later on, perceived ease of use (PEOU) of IT is added to the framework (Thong et al. 2006). This framework suggests that prior use experiences, such as IT confirmation, PU and PEOU, influence user IT satisfaction, and the satisfaction then influences IT continuance intentions. As the prior use experience helps to develop an overall perception of IT and its relationship with users, I suggest that IT attachment would function as a summative indicator of the prior experiences, and it influences IT satisfaction and IT continuance intentions directly. First, IT attachment represents a close tie or affective bond between IT and users. It provides the benefits such as safe haven and secure base in IT use. These benefits help to strengthen user satisfaction with IT. Second, when the attachment to IT is established, IT use may become habitual and autonomous, which may bypass the emotional perceptions and directly influences IT use (Ortiz de Guinea & Markus 2009). Therefore, I propose:

Proposition 1: IT attachment is positively associated with IT satisfaction.

Proposition 2: IT attachment is positively associated with IT continuance intention.

The impact of IT satisfaction on IT continuance intention has been widely studied in prior literature, it is therefore not belabored:

Proposition 3: IT satisfaction is positively associated with IT continuance intention.

In terms of the antecedents to IT attachment, I suggest that IT confirmation, PU, PEOU, and playfulness each have a positive impact on IT attachment. First, IT confirmation means that the performance expectations of using IT match the performance outcomes; in other words, a person's needs of using IT are matched by the IT functions and outcomes. When this happens, according to the attachment theory, an affective bond would development between IT and the user. On the other hand, if IT confirmation does not happen, the use may lose faith with IT and search for other means to fulfill the needs, so that IT attachment would not happen or become weakened. Therefore, I propose:

Proposition 4: IT satisfaction is positively associated with IT attachment.

Both PU and PEOU, according to the ECM-IT model and also the technology acceptance model (Davis et al. 1989), have positive influence on the attitude toward IT. PU means that the IT provides utilities to the users, and PEOU means the use of IT is effortless. Since an important criterion of attachment is that the attachment figure can relieve the subject's distress and provide comfort, encouragement, and support, it suggests that PU and PEOU can both enhance IT attachment. For PU, it means IT provides supports to the user to accomplish tasks; for PEOU, it means that the use of IT is not stressful but comfortable. Therefore, both are positively associated with IT attachment. I propose:

Proposition 5: Perceived usefulness of IT is positively associated with IT attachment.

Proposition 6: Perceived ease of use of IT is positively associated with IT attachment.

Finally, I suggest that IT playfulness (Agarwal & Prasad 1998; Webster & Martocchio 1992) would also play a role in IT attachment development. While the other three antecedents, namely IT confirmation, PU and PEOU, are all cognitive factors that contribute to a rational judgment on IT, IT playfulness, referring to the enjoyment that the user perceives when interacting with IT, would contribute to the emotional aspect of IT use. When IT use is perceived to be playful, the user would feel less concerned or frustrated, so that the attachment avoidance level would be low (and the attachment security would be high). On the other hand, if the IT is not playful, the user would not develop a sense of attachment anxiety, so that the attachment security would be low as the IT is separable. Therefore, the impacts of playfulness on both dimensions of IT attachment suggest that it has an association with the latter. I propose:

Proposition 7: IT playfulness is positively associated with IT attachment.

4 CONCLUDING REMARKS

In this paper, I develop a construct called IT attachment to examine the affective bond between IT users and IT artifacts, and use this construct to examine users' IT continuance intentions. Drawing upon the attachment theory, I suggest that user-IT attachment would develop from prior IT use. This construct contains two dimensions: anxiety and avoidance. Only a status of low anxiety and low avoidance is considered secured in IT attachment. Although a few examples of attachment relationships, such as mobile application attachment, were examined in literature, the new construct helps to address some of the limitations such as lack of IT artifacts and lack of generalizability. I then discuss the impact of IT attachment on IT continuance, and also the roles of several antecedents to IT attachment.

This study helps to understand the emotions of IT use and their impact on IT continuance. As Ortiz de Guinea and Markus (2009) argue, although emotions are found to have an impact on IT continuance, their roles are not sufficiently analyzed. This study therefore extends the literature in two aspects. First, it theorizes the IT attachment construct, providing insights into an important aspect in IT-based emotions. Second, it uses the construct to extend literature on IT continuance, providing new directions in this area of research.

A task in future research would be to develop a scale to measure IT attachment. Although scales are available in existing literature, they are mostly based on human-to-human attachments, but human-to-IT attachment was not measured. Secondly, empirical research is needed to verify the propositions in this study. Finally, the impact of IT attachment on other human-computer relations could also be explored.

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