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Vidhya Mellarkod
Texas Tech University, vidhya.mellarkod@ttu.edu

Radha Appan
Texas Tech University, radha.appan@ttu.edu

Glenn J. Browne
Texas Tech University, gbrowne@ba.ttu.edu

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Vidhya Mellarkod
Texas Tech University
vidhya.mellarkod@ttu.edu

Radha Appan
Texas Tech University
radha.appan@ttu.edu

Glenn J. Browne
Texas Tech University
gbrowne@ba.ttu.edu

ABSTRACT

Counterfactual thoughts (CFTs) are imagined alternatives to an actual event, and are pervasive in our daily lives. It is not unusual for one to think of what might have been if only a few subtle details of the past had been different. CFTs often arise from disconfirmation of expectations. Such thoughts have been proposed to influence satisfaction, disappointment and continuance intentions in the fields of marketing and psychology. However, the traditional expectation-disconfirmation theory (EDT), often employed to study satisfaction and continuance intentions has failed to recognize the role of CFTs. Accordingly, this study presents a conceptual model and empirically examines the moderating role of CFTs in the relationship between expectation disconfirmation and satisfaction, and the effect of CFTs on disappointment and IS continuance intentions. Results strongly support the hypothesized role of CFTs. This study contributes to a better conceptualization of the post-implementation user cognition and EDT, which has been traditionally used to examine user satisfaction and continuance intentions.

Keywords

IS implementation, counterfactual thoughts, satisfaction, disappointment, continuance intention

INTRODUCTION

If only … If only I had gone to college, I would not be unemployed today. If only I had spent more time with my children, I would feel closer to them today. If only those systems analysts had listened to me, this new software program might actually do what I need it to do. Such thoughts about possible yet imaginary alternatives to an actual event are called counterfactual thoughts (CFTs). It is not unusual for one to think of what might have been, or what could have occurred if only a few subtle details had been different. CFTs are commonplace when people's expectations are not met.

Many studies in psychology and marketing have acknowledged the presence of CFTs in people's mental lives (e.g., Galinsky et al. 2002; Gilovich and Medvic 1995; Gleicher et al. 1995; Hetts et al. 2000; Roese and Olson 1995). Such studies have found that CFTs of customers are important diagnostic determinants of customer satisfaction and post-purchase behavior (Inman et al. 1997; Taylor 1997; Tsiros 1998). To this point, though, research on IS success has focused only on the relationships between disconfirmation of user expectations and user satisfaction and continuance intention, and has to this point failed to recognize the potential role of CFTs. However, CFTs are likely in this context because IS frequently fail to meet users' expectations. For example, in such a case a user might indulge in CFTs relating to how the system could have been better (e.g., with improved technology or interface or functionalities) if some salient antecedent of the actual outcome had been altered (e.g., if the developers had taken a different course of action or the analyst had had a better understanding of user requirements). Such thoughts result in user disappointment, which has been found empirically to have a significant influence on user satisfaction in a variety of studies conducted in the fields of marketing and social psychology (Tsiros and Mittal 2000).

Recognizing that users indulge in CFTs, particularly when the IS does not meet their expectations, necessitates a re-examination of the relationship between disconfirmation, disappointment, satisfaction, and continuance intention. First, the relationship between disappointment (a construct distinct from user satisfaction/dissatisfaction) and continuance intention has not been thoroughly

examined. Second, past research has stressed the importance of satisfaction and continuance intention as measures of IS success. However, in examining the antecedents to satisfaction and the relationship between satisfaction and continuance intention, such research has assumed direct relationships between disconfirmation and satisfaction and between satisfaction and continuance intention (Bhattacherjee 2001; McKinney et al. 2002). However, direct relationships may not always exist, as people may engage in counterfactual thinking that may substantially moderate the relationship between disconfirmation and satisfaction as well as between satisfaction and continuance intention (Kahneman and Miller 1986). The cognitive mechanisms that underlie the experience of user satisfaction and continuance intention are not well understood, and given the importance of satisfaction and continuance intention to IS success, such an understanding is necessary. Accordingly, the present study presents a conceptual model highlighting the role of CFT and disappointment in the relationship between expectation disconfirmation, user satisfaction, and continuance intention in the context of IS implementation.

LITERATURE REVIEW AND CONCEPTUAL MODEL

During the last two decades user satisfaction and continued usage of IS have been examined as overall measures of system success (Bhattacherjee and Premkumar 2004; Bhattacherjee 2001; DeLone and McLean 1992, 2002; Doll and Torkzadeh 1988; Galletta and Lederer 1989; Ives and Olson 1984; Ives, Olson, and Baroudi 1983; Seddon 1997). User satisfaction refers to "...an affective attitude towards a specific computer application by someone who interacts with the application directly." (Doll and Torkzadeh 1988, p. 261). Applying the expectation-disconfirmation paradigm, a number of studies have examined the antecedents to user satisfaction and their relationships with IS continuance intention (Oliver 1980; Bhattacherjee 2001; Bhattacherjee and Premkumar 2004; McKinney et al. 2002; Yi 1990). According to this line of research, disconfirmation (users' subjective judgments resulting from comparing their initial expectations and their perceptions of performance of the IS) and initial expectation (an aggregation of an individual's belief elements based on prior experiences or external information) jointly determine user satisfaction or dissatisfaction with an IS, which in turn determines continued IS usage or non-usage (McKinney et al. 2002; Oliver 1980; Olson and Dover 1979; Spreng et al. 1996).

It is important to note that high levels of disconfirmation could be experienced in more than one scenario. For instance, high levels of disconfirmation could be experienced by a user with high initial expectation who encounters a low performing system or by a user with low initial expectation who encounters a high performing system. For the purposes of this study, we are interested only in the former as disconfirmation that results from high performing systems usually do not have negative consequences.

Using this paradigm as a starting point, we developed a conceptual model to utilize in the present research along with propositions to guide the research. The model is shown in Figure 1. The following propositions rely on the theory discussed above and past empirical findings:

P1: Users' initial expectations are positively associated with their satisfaction with IS use.

P2: Users' disconfirmation is negatively associated with their satisfaction with IS use.

P3: Users' level of satisfaction with initial IS use is positively associated with their IS continuance intention.

The present research also extends the above research by accounting for counterfactual thoughts in helping to explain users' continuance intention. User satisfaction often overshadows or subsumes the disappointment construct in IS research, perhaps because both result from a comparison of actual performance against a reference point. However, a clear distinction exists between satisfaction and disappointment. While satisfaction is a comparison between the expected and actual performance, disappointment results from a comparison between actual performance and the perceived performance of the forgone alternative. Therefore, the reference points are different – for satisfaction the reference point is internal, whereas for disappointment the reference point is external. Thus, it is essential to examine the disappointment construct further.

Disappointment refers to affective reactions that result from the comparison of negative outcomes with desired but imagined alternatives i.e. affective reactions that arise from counterfactual thinking (van Dijk and Zeelenberg 2002a). Disappointment is related to situational variables, in which the aspects of the situation are viewed as the cause for the undesired outcome (Kelsey and Schepanski 1991; van Dijk and Zeelenberg 2002b; Zeelenberg and Pieters 1999; Zeelenberg et al. 1998). In situations in which users perceive an information system to be a failure, they are more likely to blame the actions of others, such as analysts or developers, rather than blame themselves. In the context of consumer decision making, it has been found that affective reactions such as disappointments (that result from comparing actual outcome with forgone outcome) result in the adjustment of consumer's level of satisfaction with the outcome (Tsiros and Mittal 2000). It has also been found that when customers are disappointed with the chosen alternative when compared to

the perceived outcome of an alternative, they are likely to shift to the forgone alternative or at the least discontinue the chosen alternative. Drawing from this literature, we propose that both user's satisfaction and continued use intention are affected by the extent of user's disappointment.
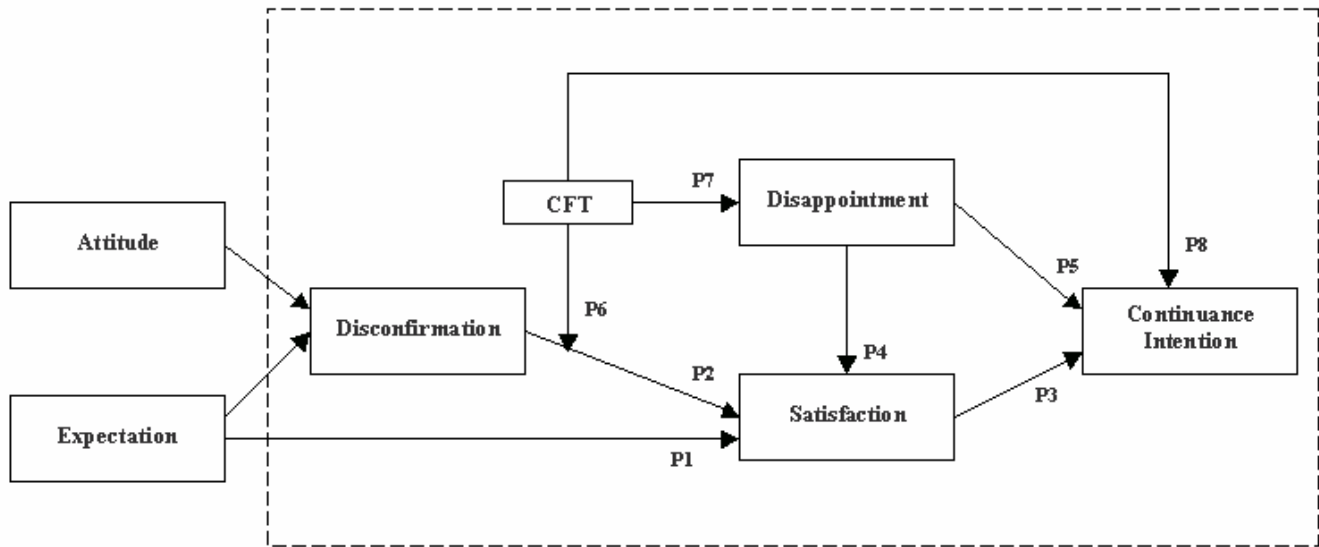
Figure 1. Conceptual model explicating the effects of CFTs on user satisfaction, disappointment and continuance intention

P4: Disappointment with the IS negatively influences user satisfaction.

P5: Continuance intention of users is negatively influenced by users' disappointment with an IS.

As noted, counterfactual thinking refers to the process of imagining what might have been, i.e., comparing reality with alternative possibilities (Walchli and Landman 2003). There are two basic types of counterfactual thoughts: upward counterfactuals, which make us feel bad, and downward counterfactuals, which make us feel grateful. Upward CFTs are comparisons made between reality (the factual outcome) and the imagined alternate scenarios that have better outcomes, or are more desirable (Roese 1997), and thus make us feel bad by comparison. Downward CFTs are imagined alternatives that turn out to be worse than reality, i.e., thoughts about how things might have been worse. Thus, downward CFTs make us feel grateful through the comparison. We propose the following:

P6a: The relationship between disconfirmation and satisfaction is more negatively moderated for users with upward CFTs when compared to users with no CFTs.

P6b: The relationship between disconfirmation and satisfaction is more negatively moderated for users with upward CFTs when compared to users with downward CFTs.

P6c: The relationship between disconfirmation and satisfaction is more positively moderated for users with downward CFTs when compared to users with no CFTs.

P7a: Disappointment will be greater for individuals with upward CFTs than individuals with no CFTs.

P7b: Disappointment will be greater for individuals with upward CFTs than individuals with downward CFTs.

P7c: Disappointment will be lesser for individuals with downward CFTs than individuals with no CFTs.

According to Roese (1997), CFTs not only elicit strong emotional responses, but also provide behavioral prescriptions for avoiding such negative emotions, and may be particularly effective at inducing changes in behavioral intentions as well as actual behavior. Therefore, we propose that while engaging in CFTs when an IS fails to meet one's expectations, an individual is likely to be strongly

motivated to engage in future behaviors that minimize the chances of experiencing negative affect (Hetts et al. 2000; Miller and Taylor 1995; Roese 1994; Simonson 1992). Thus, we propose that when compared to downward (upward) CFTs, upward (downward) CFTs more negatively (positively) influence continuance intentions.

P8a: Continuance Intention will be weaker for individuals with upward CFTs than individuals with no CFTs.

P8b: Continuance Intention will be weaker for individuals with upward CFTs than individuals with downward CFTs.

P8c: Continuance Intention will be stronger for individuals with downward CFTs than individuals with no CFTs.

METHODOLOGY

Participants were 120 undergraduate students from a class in the college of business at a research university. Participants received extra credit in the course in exchange for their participation in this experiment. Participants were given one of the three versions of a case (no CFTs, upward CFTs, and downward CFTs) that described how a new information system, when introduced, negatively affected an employee's performance in his job. The context of the case was an information system used in the hotel industry, and the employee involved was a maintenance worker at a hotel (the employee's profile and job description were provided at the beginning of the case). The case was given to the subjects in three parts, with a set of questions at the end of each part. Part one described an optimistic scenario in which companies in the hotel industry were described to be successfully implementing an IS. At the end of this part, subjects were asked to answer questions relating to initial expectations (scales adapted from Bhattacherjee et al. 2004) and attitudes (scales adapted from Bhattacherjee et al. 2004) from the perspective of the maintenance employee. The second part described the system implementation phase, which gave rise to an undesirable situation for that maintenance employee. After this part, subjects were asked to answer questions relating to expectancy disconfirmation on behalf of the maintenance employee. Subjects in the treatment groups received the third part, which described upward or downward CFTs arising in the mind of the maintenance employee. After this part, subjects in all the conditions (control and treatments) were asked to answer questions relating to satisfaction (scales adapted from Bhattacherjee et al. 2004), disappointment (scales adapted from Zeelenberg et al. 1998), and continuance intention (scales adapted from Bhattacherjee 2001). Finally, the subjects completed a brief demographic survey.

INITIAL DATA ANALYSIS

Preliminary analyses of the data examined only the role of CFTs in our proposed conceptual model (that is, only Propositions 6, 7, and 8 were tested). One-way ANOVAs were employed to compare the effects of upward CFTs, downward CFTs, and absence of CFTs on user satisfaction, disappointment, and continuance intention. Further, planned comparisons were made between groups. Results of the preliminary analysis have been summarized in Table 1. Table 2 provides the means for each measure [describe the scale in the table].

	User Satisfaction		Disappointment		Continuance Intentions	
	F Value	P value	F Value	P value	F Value	P value
Control, Upward, and Downward CFT (Overall Comparisons)	126.57	<0.001	33.93	<0.001	68.08	<0.001
Pair-wise Comparisons:						
Upward and Control	13.51	0.0004	0.0011	0.97	0.13	0.71
Upward and Downward	288.85	<0.001	48.88	<0.001	113.16	<0.001
Downward and Control	110.81	<0.001	72.78	<0.001	97.88	<0.001

Table 1. ANOVA Analysis

	User Satisfaction	Disappointment	Continuance Intentions
Control	2.70	4.837	3.42
Upward CFT	2.09	4.825	3.49
Downward CFT	4.51	2.45	5.725

Table 2. Mean values for Control and Treatment Groups

Results of the ANOVAs revealed significant differences between the three groups for satisfaction, disappointment, and continuance intentions. Planned pairwise comparisons showed significant differences between all groups for all the constructs except between the upward and control groups for disappointment and continuance intentions. Thus, propositions P6a, P6b, and P6c were all supported at $\alpha=0.01$, highlighting the moderating role of CFTs in the relation between disconfirmation and satisfaction. P7b and P7c were also supported, signifying the role of upward and downward CFTs in triggering user disappointment. P8b and P8c were also supported, suggesting the importance of CFTs in influencing users' continuance intentions. Thus, the preliminary analyses provide strong initial support for the role of CFTs in explaining post-implementation cognitions. Lack of significant support for P7a and P8a could be because of the natural tendencies of individuals to indulge in upward CFTs (that is, imagine better outcomes that could have occurred). Therefore, it is possible that subjects in the control group generated upward CFTs on their own, resulting in a lack of significant difference between the control group and the treatment group that received upward CFTs. As this is research in progress, other analyses will be performed to test other aspects of the model.

IMPLICATIONS FOR RESEARCH AND PRACTICE

The present research has demonstrated that counterfactual thoughts influence user satisfaction and disappointment with information systems. The tendency for people to engage in imaginative, counterfactual thoughts has been shown in previous research to exist in a variety of domains and have significant consequences, and the present results extend these findings to the information systems domain. Our results have implications for both IS research and practice.

From a research standpoint, the current findings emphasize on the need to consider CFTs in the study of post-implementation usage of IS. First, our results suggest that CFTs have a direct influence on satisfaction, disappointment, and an indirect influence on the continuous usage intention when systems are perceived as not meeting users' expectations. Therefore, the CFT construct should be included in models attempting to predict and explain continuous use of IS. Second, this study extends expectation disconfirmation theory (EDT) as applied to the study of user satisfaction and continuance intentions by highlighting the moderating role of CFTs. Third, this research also extends EDT by introducing the disappointment construct. Future research could examine the kinds of expectancy disconfirmation that lead to disappointment, since our results show that disappointment has the potential to explain not only user satisfaction but also continuance intentions. Finally, our results show that the absence of CFTs is as bad (if not worse) than the presence of upward CFTs. This suggests the importance of continuing to investigate user cognition during and after system implementation.

For practitioners, our findings highlight the need to acknowledge the frequent generation of CFTs in users' day-to-day work environment. In the IS implementation context, it is important to recognize that disconfirmation of initial user expectations is likely to cause disappointment and a wide array of CFTs in users. Such affective responses have the potential to significantly affect user satisfaction as well as continuance intentions and thus IS success. Therefore, to improve continuance intentions and user satisfaction, managers should attempt to control post-implementation reflection in users. This could be achieved by managing users' expectations realistically (i.e., not overselling the system in the first place), and by highlighting the advantages to using the system as implementation occurs. However, such conclusions warrant further empirical investigation.

This study is a first step toward understanding the role of CFTs in the IS implementation context. More research in this area has the potential to provide researchers and practitioners with a deeper understanding of user cognitions and their impact on satisfaction and intention to use information systems.

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