



Antecedents and determinants of information technology habit

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ABSTRACT

IT researchers have recently distinguished habits from prior behavior frequency. We expanded this research by examining habit's antecedents and investigating the simultaneous effect of habit and prior IT use on continued IT use. We found that the research model was relatively robust over four specific use activities of one software application. Indeed, prior IT use, satisfaction, and importance significantly influenced IT habits. Also, while prior IT use predicted continued IT use in the combined data set, habit only predicted continued IT use for activities with higher habit levels. Practical implications are discussed.

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1. Introduction

Since the early 19th century, learning theorists have been experimenting with animals and humans to understand the formation of habits, which can be defined as learned actions that have become automatic responses to cues and are intended to obtain one or more goals. They are automatic because they occur without a person's awareness [20]. While often used to describe a behavior, habit is not a behavior in itself; it is a mind-set that drives a person to perceive habit-related stimulus cues [12]. Thus, habitual behavior is the action resulting from the cue. For example, we can describe a person's behavioral tendency to stop at Starbucks for coffee on his/her way to work as a habit and the actual behavior of stopping at Starbucks as the habitual behavior.

Despite attempts to understand habit forming activities, research on it has progressed slowly [21]. This is surprising as habits allow people to initiate and control many daily activities in an efficient and non-taxing manner [1,24]. However, researchers have historically represented habit as a result of prior behavior [22], though habits are more than frequently repeated behaviors, which do not always form habits. For example a surgeon's decision to operate is not the result of a habit.

While habits have mostly been studied as non-business behaviors, such as travel modes and exercise [3], IT researchers have recently begun to explore habit, which may be due to the

extent to which people use IT automatically because of learning [11]. Examining habit and prior IT use as distinct constructs, IT researchers have shown that prior use frequency influences habits and that habits influence continued IT use. Measuring habit separately from prior behavior frequency has also allowed researchers to explore habit's antecedents and to determine its effect, in addition to the effect of prior behavior, on future behavior.

Our study objective was to examine habit's antecedents and the effect of habit and prior IT use on continued IT use. We developed a research model using two theoretical foundations: *learning theory* and a post-adoption model described by Jasperson et al. [7]. We investigated four antecedents: prior IT use frequency, satisfaction, task complexity, and importance. While theory suggests all four factors are antecedents to habit, only prior IT use frequency and satisfaction had been studied previously in an IT context. Also, Limayem et al. examined habit's effects on continued IT use without taking into account the effects of prior IT use. Our research model included these additional effects (see Fig. 1). We tested the research model with data pertaining to four different IT use activities in one software application.

2. Literature review

2.1. Post-adoption IT models

While initial IT adoption or acceptance is known to be important researchers have argued that post-implementation or post-adoption IT use is also vital for long-term success. Efforts have mostly used intention-based models such as TAM to examine

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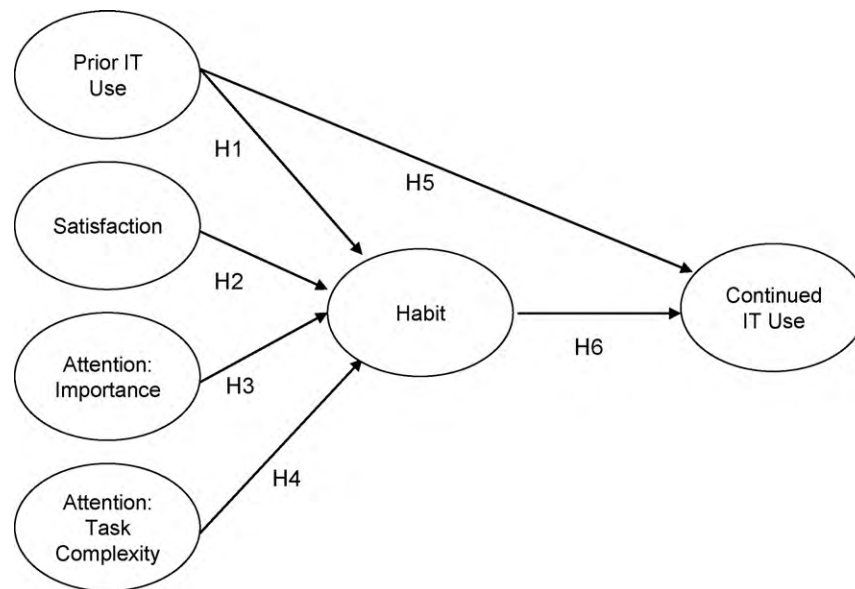


Fig. 1. Research model.

initial acceptance. Some researchers also have used intention-based models to examine post-adoption behavior. Early work found that similar beliefs explained less variance in intention for experienced than inexperienced users, suggesting that prior experience was an important factor in explaining continued IT use. More recently, Bhattacharjee [4] developed and tested a post-adoption model based on expectation–disconfirmation theory. This model depicted satisfaction, perceived usefulness, and confirmation of expectations as the important predictors of individuals' intentions to continue using a technology; it explained 42% of the variance in continued IT use intention for online banking users, and has been validated for other technologies [5,18].

Other researchers have suggested that post-adoption IT use behavior may be driven by habit, in addition to intentions and prior use. For example, the post-adoption IT model developed by Jaspersen et al. proposed that their behaviors can become habitual; this model included factors pertaining to individual cognition, thought processes, and behavior after a technology had been installed and made available. The individual factors were connected by two feedback loops: one represented reflective thought about early use behavior, while the other represented non-reflective thought that became active as individual behavior became habitual. However, this was not empirically tested.

While some empirical researchers found that with increased prior use, intentions had less influence on continued use behaviors [10], others have empirically tested post-adoption IT use models that explicitly included habit; e.g., Limayem et al. developed and tested a model that integrated habit-related theories into Bhattacharjee's model.

While providing insight into habit's role in IT continuance, Limayem et al.'s model does not include several potentially important habit antecedents. It also does not depict the influence of prior IT use on continued use. Our model included additional antecedents and the path between prior and continued IT use.

2.2. Learning theories

Various learning theory researchers have studied habit and its role in predicting behavior. This has led to research involving resistance to change, computer learning [23], e-learning [6], and experts' strategy choices [17]. While specific learning theories

differ somewhat, there is general consensus that a drive to satisfy a need leads to a response to a particular stimulus, and if the response is reinforced and/or repeated, a particular habit is learned. Thus early learning theories and post-adoption IT models depict habit as an integral part of human behavior.

3. Hypotheses development

3.1. Prior IT use implies habit

According to the post-adoption IT use model, use is a factor that changes prior IT use that is not habitual, into continued use that has become habitual. Prior IT use is an individual's use of an IT application and its features. Over time, prior IT use can create habits—an automatic tendency to use the IT.

Because using a distinct habit construct is a recent phenomena there are only a few studies linking prior behavior to habit. Limayem et al. found that past WWW use influenced WWW use habit, and Verplanken and Orbell found that habit was stronger for high frequency past behavior than for low frequency for a variety of behaviors.

H1. Prior IT use will positively influence IT use habit.

3.2. Satisfaction implies habit

The post-adoption IT model also describes the role of technology sense-making in forming habit. Technology sense-making is a cognitive process in which individuals confirm or ignore pre-use expectations by comparing them to post-use outcomes. This evaluation results in satisfaction or dissatisfaction with the process, which can cause individuals to continue or change their use patterns. When satisfaction causes individuals to continue using IT, there is likely to be an increase in habit formation.

Despite the overwhelming agreement that satisfactory experiences can form habits, empirical findings for the satisfaction–habit relationship are few. An exception is Limayem et al., who found that satisfaction positively influenced WWW use habits.

H2. Satisfaction will positively influence IT use habit.

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