Regulatory Focus in the Context of Wearable Continuance

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Abstract

The worldwide wearables market is growing, however, the discontinued use threatens the lasting utility of wearable health devices with a 30% abandonment rate. Prior research has used technology acceptance models to understand adoption and use of these technologies. However, the emphasis in prior research has been on aspects of the technology rather than aspects of the individual. To reflect the characteristics of a higher level of interaction between consumers and fitness wearable devices, we develop a model by integrating the Expectation-Confirmation Model of IS Continuance (ECM) with Regulatory Focus Theory (RFT). By introducing RFT to the IS continuance study, how wearable users deal with disconfirmation is explained in a more nuanced way. In our model, we propose that promotion focus negatively moderates the relationship between disconfirmation and perceived usefulness, whereas prevention focus positively moderates this relationship. This model provides theoretical contributions and practical contributions.

Keywords

Prevention focus, promotion focus, wearable, continuance.

Introduction

Fitness wearable devices, as facilitators of health behavior change, are often marketed by their ability to motivate people towards more physical activity (Rockmann and Gewald 2018). “Self-tracking devices use environmental, psychological or social strategies to overcome deficiencies of the user’s willpower” (Lanzing 2016, p. 12). Wearables incorporate goal-setting with self-monitoring functions, exercise guidance, performance analysis, rewards, social comparison, social recognition, and self-presentation to provide users with salient affordances (Rockmann and Gewald 2018). It is necessary to use fitness wearables regularly and continuously to achieve the success of health behavior change (Li et al. 2018). However, discontinued use threatens the lasting utility of wearables, with the abandonment rate at 30% (Valencell 2018). Therefore, the research question is: what factors influence the continued use of fitness wearables?

Expectation Confirmation Theory (ECT) is the most popular theoretical lens to study continued use of wearables (e.g. Buchwald et al. 2018; Hong et al. 2017; Li et al. 2018; Nascimento et al. 2018). Other technology acceptance models such as TAM (e.g. Hong et al. 2017), UTAUT (e.g. Buchwald et al. 2018) and TPB (e.g. Song et al. 2018) are also used as theoretical foundations. Continuance intention is the dominant dependent variable in these papers.

Although previous research has shed light on explaining the continued use of fitness wearables, the emphasis in prior research has been on aspects of the technology that drive continuance rather than aspects of the individual. Usually, users’ perceptions of technology are studied in these papers. One problem with seeing the technology as users’ perception is that the distinctness of consumer health information technologies from other types of information technologies is weakly addressed. The characteristics of a higher level of interaction between consumers and fitness wearables are missing in the existing IS
continuance research regarding fitness wearable devices. Therefore, theories related to users’ characteristics or motivational theories are needed to explain the discontinued usage in a more nuanced way.

In this paper, we draw on Regulatory Focus Theory (RFT) (Higgins 1998) to reflect the way that users of wearable devices deal with the experience of disconfirmation of their health and wellness expectations. By integrating the Expectation-Confirmation Model of IS Continuance (ECM) with RFT, this study contributes to the IS continuance literature by explaining users’ continuance of fitness wearables through the combination of personal and technical factors, especially, how individual difference variables influence people’s perceptions of technology and shape people’s later cognitions and behaviors.

Theoretical Background

**Expectation-Confirmation Model of IS Continuance (ECM)**

Drawing on the Expectancy Confirmation Theory (ECT), Bhattacherjee (2001) developed the Expectation-Confirmation Model of IS Continuance (ECM) to explain the salient motivations underlying IS continuance. The distinction between acceptance and continuance was elaborated in ECM by considering user’s psychological motivations “emerging” after their initial acceptance. In this model, users’ continuance intention is influenced by their satisfaction with IS use and perceived usefulness of continued IS use. User satisfaction is determined by perceived usefulness and confirmation of expectation from prior IS use.

ECM has been used widely as a theoretical foundation to study IS continuance. Ortiz de Guinea and Markus (2009) revealed that conscious intentions (or reasoned action), emotions and habits are rival explanations for continuing IT use. Habit was introduced as a moderator between intention and behavior in the ECM by Limayem et al. (2007). Venkatesh et al. (2011) brought context-based factors from UTAUT into ECM, including effort expectancy, social influence and facilitating conditions as well as trust. Bhattacherjee and Lin (2015) present a unified model by incorporating subjective norm and habit into the ECM to address the three rival explanations for continuance behaviors as a whole.

The ECM model has been well studied, but as noted earlier, focuses on perceptions of the technology and does not adequately reflect individual differences that influence how those perceptions are formed and how they shape later cognitions and behaviors. To fill this gap, we bring the RFT into explaining the individual differences in the motivational orientation. The promotion and prevention focused motivations in RFT help us understand the diverse ways in which individuals interpret the experience of disconfirmation.

**Regulatory Focus Theory**

Regulatory Focus Theory (RFT) identifies a key motivational principle influencing multiple human activities (Higgins 1998). RFT proposes that individuals’ needs can be divided into two categories—advancement (such as growth, development and achievement) and security (such as safety, responsibilities and protection) (Higgins 1998; Crowe and Higgins 1997). This theory leads to two types of regulatory foci, namely, promotion focus and prevention focus (Crowe and Higgins 1997). The two foci are on independent dimensions. It is possible for individuals to have high or low levels of both, either, or neither (Higgins 1998).

Perceptions, emotions and behaviors can be affected by the regulatory focus in different contexts (Liang et al. 2013). However, the application of RFT in IS research is scarce (Liang et al. 2013). In existing IS research, RFT has been used to study employees’ IT compliance (Liang et al. 2013), users’ community commitments (Song et al. 2018), and consumers’ routine use intention of mobile health services (Liu et al. 2018).

Similar to the routine use intention, continuance intention, as another typical motivated behavior, which may be also influenced by the regulatory foci. In the study of routine use intention, Liu et al. (2018) propose that people have two different expectations while using mobile health services, namely health promotion expectancy and disease prevention expectancy. In their model, promotion focus positively moderates the relationship between health promotion expectancy and routine use intention, whereas prevention focus positively moderates the relationship between disease prevention expectancy and routine use intention.

Alternatively, in our model, we would argue that people may have various health and wellness expectancies at the same time when they are using fitness wearables, but the way they act on achieving these goals or expectancies are different depending on their primary regulatory focus. For example, the person with promotion focus expects the fitness tracker to help them lose weight while the person with prevention focus
expects it to keep them from gaining weight. The promotion focus and prevention focus may influence how people perceive the performance of technology and how later cognitions and behaviors are formed.

**Research Model**

Figure 1 depicts the theoretical model in a fitness wearable context (e.g. Fitbit), drawing upon ECM and RFT. We examine how two foci from RFT moderate relationships between disconfirmation and perceived usefulness and between disconfirmation and satisfaction, and then influence continuance intention.

![Figure 1 Theoretical Model](image)

**Disconfirmation**

Disconfirmation is a subjective post-usage comparison, which measures users’ perceptions of how much the actual performance of IS meets the expectation of IS use in the pre-acceptance period (Bhattacherjee 2001; Bhattacherjee and Premkumar 2004). People will experience cognitive dissonance when there is an (either positive, neutral, or negative) discrepancy between pre-exposure expected usefulness and post-exposure experience (Bhattacherjee and Lin 2015; Bhattacherjee and Premkumar 2004). To minimize this dissonance, users are expected to adjust their perceptions of usefulness, so that a positive disconfirmation leads to an increased perception of usefulness and vice versa (Bhattacherjee and Lin 2015; Bhattacherjee and Premkumar 2004). Recent research on smartwatch continuance also validate this positive relationship (Nascimento et al. 2018). IS continuance research suggests that users’ disconfirmation positively influences their satisfaction with the technology (Bhattacherjee and Lin 2015; Bhattacherjee and Premkumar 2004). When the actual performance of IS fails to meet users' initial expectation, negative disconfirmation happens and people are dissatisfied (Bhattacherjee and Lin 2015; Bhattacherjee and Premkumar 2004).

H1. Disconfirmation is positively associated with perceived usefulness.

H2. Disconfirmation is positively associated with satisfaction.

**Perceived Usefulness**

Perceived usefulness, or the expected benefits of using an IS, is a well-established predictor of IS acceptance and continuance behavior (Davis 1989; Bhattacherjee 2001; Venkatesh et al. 2011). Numerous studies of IS continuance have validated the positive relationship between perceived usefulness and satisfaction, and the positive relationship between perceived usefulness and continuance intention (Bhattacherjee 2001; Limayem et al. 2007; Venkatesh et al. 2011). Current research on the use of fitness wearables also supports these two relationships (Buchwald et al. 2018; Nascimento et al. 2018). Therefore, we hypothesize:

H3. Perceived usefulness is positively associated with satisfaction.

H4. Perceived usefulness is positively associated with continuance intention.

**Satisfaction**

Satisfaction describes a user’s emotional state, feelings, or affective attitudes toward the prior IS usage experience (Bhattacherjee 2001). IS continuance research suggests that people who are satisfied with the prior IS usage will have a higher likelihood to continue using the system (Bhattacherjee 2001). The positive relationship between satisfaction and continuance intention has also been validated in studies of fitness wearable continuance (Nascimento et al. 2018). Therefore, we hypothesize:

H5. Satisfaction is positively associated with continuance intention.
**Promotion Focus**

People with promotion-focus motivations are sensitive to the presence or absence of positive outcomes (Higgins 1998; Liang et al. 2013). The desired end state for them is the presence of positive outcomes, which people may regulate their behaviors with strategies either by maximizing the presence of positive outcomes or minimizing their absence (Chernev 2004).

In the context of Fitbit, positive outcomes represent the improvement of health conditions, such as weight loss, more fitness, better sleep, and a better mood. Since people with the promotion focus are inclined to avoid errors of omission and attain achievements as many as possible (Crowe and Higgins 1997), they are more comfortable with a relatively long time to achieve health behavior change and a less apparent health improvement outcome. With a focus on the goal achievement, they have a stronger desire to persist longer especially when task difficulty is high (Crowe and Higgins 1997). When the negative disconfirmation happens, their perception regarding the expected benefit of continuing using Fitbit won’t get worse. Similarly, their satisfaction regarding Fitbit won’t get worse. Thus, we posit that the positive influence of disconfirmation on perceived usefulness may be weaker when it interacts with users’ promotion-focused motivations and same for the relationship between disconfirmation and satisfaction.

H6: Promotion focus negatively moderates the relationship between disconfirmation and perceived usefulness.

H7: Promotion focus negatively moderates the relationship between disconfirmation and satisfaction.

**Prevention Focus**

People with prevention-focus motivations are sensitive to the presence or absence of negative outcomes and attempt to avoid risks and losses (Higgins 1998; Liang et al. 2013). The desired end state for them is the absence of negative outcomes, which people may use vigilant avoidance strategies to avoid (Chernev 2004).

In the context of Fitbit, negative outcomes are gaining weight, less fitness, worse sleep, and a worse mood. If a negative disconfirmation happens after prior use of Fitbit, people with a prevention-focused motivation may take it as a failure to achieve the desired goal (i.e., the absence of negative outcomes). Since individuals with a prevention focus are inclined to attain correct rejections and avoid errors of commission (Crowe and Higgins 1997), their perception regarding the expected benefit of continuing using Fitbit gets worse with the existence of negative disconfirmation. Similarly, their satisfaction regarding Fitbit also gets worse. Therefore, we posit that the positive influence of disconfirmation on perceived usefulness may be stronger when it interacts with users’ prevention-focused motivations and same for the relationship between disconfirmation and satisfaction.

H8: Prevention focus positively moderates the relationship between disconfirmation and perceived usefulness.

H9: Prevention focus positively moderates the relationship between disconfirmation and satisfaction.

**Conclusion and Outlook**

Our model explains users’ differential continuance behaviors regarding the disconfirmation between their expectations and actual IT performance of a fitness wearable by integrating RFT with ECM. Current users of Fitbit will be the sample. We will adapt measurements for constructs of ECM from Bhattacherjee (2001) and constructs of RFT from Song et al. (2018). Demographic data work as control variables. We will run a measurement validation test and then validate the model via SEM. This study provides theoretical contributions to the IS continuance literature and practical contributions to the design of fitness wearables.

**REFERENCES**


