The Role of Perceived Risk in Consumer Acceptance of Health-Related Technologies

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Introduction

Background
- The proposed model incorporates a conceptualization of elements from the Health Belief Model (HBM), namely perceived risk, into the Technology Acceptance Model (TAM) (Rosenstock, 1974; Bauer, 1960; Davis, 1989).
- Inconsistencies exist in the definitions and measurement of the dimensions of perceived risk in the literature (Brewer, 2007).
- Studies involving pre-prototype testing (i.e., a vignette describing the technology) have found that adoption can be adequately predicted without requiring the user to interact with the actual technology or even a prototype model (Davis & Venkatesh, 2004).

Research Objectives
1. To incorporate constructs from the perceived risk literature into the Technology Acceptance Model (TAM)
2. To explore the dimensions of perceived risk which are relevant in a health care context
3. To test the associations among the variables present in the HealthTAM

Methods

Sample
- National online panel of individuals with diabetes (n=409) completed a cross-sectional, Internet-based, self-administered survey

Vignette
- The research subjects were asked to read a vignette that described a future technology designed to allow individuals with diabetes to monitor blood sugar levels without the use of lancets or the need to draw blood
- Each time an interaction with the device was described in the vignette, the device was carefully compared to a blood-based glucose testing device to reduce the ambiguity of using the device

Table 1 – HealthTAM Constructs

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<thead>
<tr>
<th>Construct</th>
<th>Definition</th>
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<td>Perceived usefulness</td>
<td>the degree to which a person believes that using a particular system would enhance his or her performance</td>
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<td>Perceived ease of use</td>
<td>the degree to which a person believes that using a particular system would be free of effort</td>
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<td>Perceived risk</td>
<td>the degree to which a person believes that adopting a particular system will result in negative outcomes</td>
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<td>Attitude</td>
<td>an individual’s positive or negative evaluation of performing a behavior</td>
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Measures

Perceived Risk
- Perceived risk in health behavior literature has largely ignored the conceptualization of risk from the marketing literature
- Conceptualization of perceived risk in the marketing literature provides a more inclusive explanation of the overall risk perception that occurs in decisions making

Technology Acceptance Model (TAM)
- The relationships between the original TAM constructs were retained to determine how they would perform in a health context.

Construct Measurement
- Each of the multi-item constructs were measured using 7-point numerical rating scales, where 1-strongly disagree and 7-strongly agree. The scales were modified from the measures provided by Davis (1989), Davis & Venkatesh (2004) and Stone & Gronhaug (1993)

Analysis

Structural Equation Model
- Andersen and Gerbing’s (1988) two-step structural equation modeling approach was used to examine the relationships in the HealthTAM model
  - Measurement model (Hair, 2006 and Bollen, 1989)
  - Structural model (Bollen, 1989)
- Adjusted for common methods bias (Podsakoff, 2003)
- Reported fit indices ($\chi^2$, CFI, and RMSEA) were selected based on recommendations of Jaccard and Wan (1996)

Results

HealthTAM Relationships
- After adjusting for common methods variance, both perceived usefulness and perceived ease of use were found to have positive relationships with attitude; however, the relationship between the two constructs was found to be non-significant.
- As hypothesized, perceived ease of use was found to be negatively related to perceived risk. In addition, perceived risk was found to be negatively related to attitude, but not to perceived usefulness.

Measurement Model Specification

Perceived Risk
- Following procedures outlined by Hair (2006) and Bollen (1989), three dimensions of perceived risk were removed from the measurement model
  - Social risk, performance risk, and financial risk

Structural Model Results
- After accounting for common methods variance, the final research model resulted in an adequate fit considering the complexity of the model (Schumacker & Lomax, 2004; Hu & Bentler, 1999)

Measurement Model Results — Standardized Regression Coefficients

- Perceived risk was found to be negatively related to perceived ease of use ($\beta=-0.05$, $p=0.693$)

Conclusions

Unexpected Relationships
- One might expect perceived usefulness and perceived ease of use to perform uncharacteristically if the individuals were not able to make the connection between the vignette and a tactile experience.
- Zeithaml (1981) found that as the intangibility of a product increases, the more difficult risk assessments become, which might explain the nonsignificant relationship between perceived risk and perceived usefulness ($\beta=0.05$, $p=0.693$).

Study Contributions
- Incorporated elements of perceived risk into the technology acceptance model (TAM)
- Identified perceived risk dimensions relevant to health
- First known application of the TAM in a consumer sample of individuals with a specific health condition

Acknowledgements
This project was supported by a Graduate Research Data Collection Grant from the Center for Pharmaceutical Marketing and Management, Research Institute of Pharmaceutical Sciences, The University of Mississippi, by the William E. Farlow Fellowship, and by the Graduate Student Council Grant Program.

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