

Smart Home Systems for Safety and Security and Individuals' Motivational Orientation to Prevention

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Abstract

Smart home systems for safety and security are in high demand and always needed for many reasons including people's desire to feel safe in their own houses and to avoid a high rate of crime. In the current research, we investigate the role of individuals' motivational orientation to prevention in their responses to smart home systems for safety and security. That is, this research examines whether individuals' attitudes toward smart home systems for safety and security vary depending on their level of prevention orientation. Specifically, it is hypothesized that individuals with strong (vs. weak) prevention orientation will have more positive attitudes toward smart home systems for safety and security. In support of the hypothesis, the results indicate that respondents in the strong (vs. weak) prevention orientation reported significantly more positive attitudes toward smart home systems for safety and security. Our findings imply that individuals' motivational orientation to prevention may be an effective marketing and segmentation tool in facilitating their favorable responses to the smart home systems for safety and security.

Keywords: Smart Home System, Safety, Security, Prevention Orientation, Attitude

1. Introduction

The concept of smart home is a promising and efficient way of maintaining good health, providing comfort and safety thus helps in enhancing the quality of life [1]. With the rapid increase in aging population around the world, smart home technology has gained a lot of attention due to its versatile applications in the area of Internet of Things (IoT) [1]. A smart home system is defined as “a residence equipped with various technologies such as network systems, detecting sensors, and appliances that have available automatic controls to provide inhabitants comfort, convenience, and security” [2]. Specifically, a smart home system provides homeowners with various services and applications (e.g., safety and security, automation, entertainment, and energy management) with minimum or no intervention [3].

In particular, smart home systems for safety and security are in high demand and always needed for many reasons including people's desire to feel safe in their own houses and to avoid a high rate of crime [4]. That is,

Manuscript Received: April. 19, 2022 / Revised: April. 22, 2022 / Accepted: April. 24, 2022

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safety and security systems (e.g., fire alarm systems, gas leakage detection systems, motion detection systems, etc.) are employed to monitor surrounding environments to provide homeowners with live updates and alarms when harmful situations and serious accidents may occur while they are far away. In the current research, thus, we mainly focus on smart home systems for safety and security.

Moreover, most recent studies on smart home systems have examined the effects of one or other of the particular characteristics of the systems on the users' perceptions, adoption, usage intention, and resistance [5]. However, few studies have identified individual characteristics influencing their acceptance and usage of smart home systems [6], although some notable exceptions exist [7, 8]. Therefore, we examine the role of individuals' motivational orientation to prevention in their responses to smart home systems for safety and security. More specifically, we examine whether individuals' attitudes toward smart home systems for safety and security vary depending on their level of prevention orientation.

2. Theoretical Background and Hypothesis Development

How people regulate their goals is elaborated upon in the concept of regulatory focus [9]. Regulatory focus is a basic aspect of motivation and represents the manner in which individuals react toward possible threats to the outcomes and goals that humans generally pursue [9]. Regulatory focus theory proposes that self-regulation affects consumer behavior, which includes cognitive, motivational, and behavioral components [10]. Two distinct motivational systems are distinguished, that is, a promotion and prevention focus [9]. Both foci determine people's specific motivation and information processing [11]. Specifically, in a promotion focus, individuals are oriented toward fulfilling their hopes and aspirations (or ideals), and their goal is accomplishment, advancement, and improvement. In contrast, prevention-focused individuals are oriented toward meeting their duties and responsibilities (or oughts), and their goal is security and safety [12].

Furthermore, regulatory fit occurs when an individual's regulatory focus and the type of information processed are compatible [13]. Individuals in a promotion orientation are more receptive to informational aspects that fulfill their ideal goals and address advancement and achievement. Conversely, prevention-oriented individuals are more attentive to informational aspects that appeal to their needs to fulfill duties and responsibilities and that address safety and security needs. Previous research demonstrated that compatibility of ad content and consumer regulatory focus positively impacted brand attitudes and the perceived effectiveness of the ad [14]. In a similar vein, regulatory focus compatibility of product attributes was found to positively influence product evaluations [15]. Building upon prior research, smart home systems for safety and security fit a prevention orientation. Therefore, we propose that individuals with strong (vs. weak) prevention orientation will have more positive attitudes toward smart home systems for safety and security.

3. Method

A total of 145 undergraduate students (54 females, 91 males) at a mid-sized university who ranged in age from 18 to 28 years (mean = 21.08, SD = 2.09) completed the survey. The survey contained items measuring the respondents' motivational orientation to prevention and their overall attitudes toward each smart home system for safety and security, along with their demographic characteristics (e.g., age, gender, and academic major).

Regulatory focus can be both a trait when one of the foci is dominant within a person (trait focus) and a state elicited by the situation (state focus) [16]. In this research, we primarily focus on individuals' personal trait (i.e., chronic regulatory orientation). Thus, all the respondents completed a measure of prevention orientation [17]. Specifically, the respondents' motivational orientation to prevention was measured using 9 items (i.e., "I frequently think about how I can prevent failures in my life"; "I am anxious that I will fall short

of my responsibilities and obligations”; “I often think about the person I am afraid I might become in the future”; “In general, I am focused on preventing negative events in my life”; “I often worry that I will fail to accomplish my academic goals”; “I often imagine myself experiencing bad things that I fear might happen to me”; “I am more oriented toward preventing losses than I am toward achieving gains”; “My major goal in school right now is to avoid becoming an academic failure”; “I see myself as someone who is primarily striving to become the self I “ought” to be-fulfill my duties, responsibilities, and obligations”). Responses were made on 7-point scales with higher scores being associated with stronger prevention orientation. All items hung together as a highly coherent scale (Cronbach’s $\alpha = .754$). Thus, the responses were averaged to create a single index of motivational orientation to prevention ($M = 4.84$, $SD = .90$). All the respondents were classified as either weak ($n = 78$; $M = 4.16$, $SD = .56$) or strong ($n = 67$; $M = 5.62$, $SD = .47$) prevention orientation group on the basis of a median split ($M_{dn} = 4.89$).

Then, the respondents were asked to rate their overall attitudes toward the smart home systems for safety and security. Regarding the smart home systems for safety and security, we focused on eight types of smart home systems: gas leakage & fire detection system, emergency notification system, theft & intrusion prevention system, home monitoring system in the absence of homeowners, smart door lock, unmanned delivery system, in-home monitoring system for surveillance, and home healthcare system. The overall attitude toward the smart home system for safety and security was measured using a single-item, 7-point scale (1 = “I dislike it very much”, 7 = “I like it very much”) [7, 8]. Previous research has shown that for doubly concrete constructs, single-item measures demonstrate predictive validity equal to that of multiple-item measures [18-20]. In addition, researchers may decide to choose single-item measures in light of their manifold practical advantages [21].

4. Results

ANOVA was performed to test our hypothesis. As stated, we predicted that individuals with strong (vs. weak) prevention orientation will have more positive attitudes toward smart home systems for safety and security. The results are summarized in Figure 1. Consistent with our hypothesis, in terms of the overall attitude toward the smart home systems for safety and security, respondents with strong (vs. weak) prevention orientation reported significantly higher attitudes toward them, as presented in Figure 1. Specifically, for the gas leakage & fire detection system, overall attitude score was significantly higher in the strong (vs. weak) prevention orientation condition ($M_{strong} = 6.55$, $SD = .78$ vs. $M_{weak} = 6.03$, $SD = 1.14$; $F(1, 143) = 10.171$, $p = .002$). For the emergency notification system, overall attitude score was significantly higher in the strong (vs. weak) prevention orientation condition ($M_{strong} = 6.43$, $SD = .94$ vs. $M_{weak} = 5.83$, $SD = 1.21$; $F(1, 143) = 10.815$, $p = .001$). For the theft & intrusion prevention system, overall attitude score was significantly higher in the strong (vs. weak) prevention orientation condition ($M_{strong} = 6.57$, $SD = .74$ vs. $M_{weak} = 6.05$, $SD = 1.09$; $F(1, 143) = 10.696$, $p = .001$). For the home monitoring system in the absence of homeowners, overall attitude score was significantly higher in the strong (vs. weak) prevention orientation condition ($M_{strong} = 6.30$, $SD = 1.09$ vs. $M_{weak} = 5.56$, $SD = 1.30$; $F(1, 143) = 13.415$, $p = .000$). For the smart door lock, overall attitude score was significantly higher in the strong (vs. weak) prevention orientation condition ($M_{strong} = 6.42$, $SD = .82$ vs. $M_{weak} = 5.55$, $SD = 1.32$; $F(1, 143) = 21.796$, $p = .000$). For the unmanned delivery system, overall attitude score was significantly higher in the strong (vs. weak) prevention orientation condition ($M_{strong} = 6.54$, $SD = .80$ vs. $M_{weak} = 5.59$, $SD = 1.38$; $F(1, 143) = 24.417$, $p = .000$). For the in-home monitoring system for surveillance, overall attitude score was significantly higher in the strong (vs. weak) prevention orientation condition ($M_{strong} = 5.51$, $SD = 1.72$ vs. $M_{weak} = 4.63$, $SD = 1.74$; $F(1, 143) = 9.289$, $p = .003$). For the home healthcare system, overall attitude score was significantly higher in the strong (vs. weak) prevention orientation

condition ($M_{\text{strong}} = 6.16$, $SD = 1.12$ vs. $M_{\text{weak}} = 5.71$, $SD = 1.28$; $F(1, 143) = 5.186$, $p = .024$). Hence, our hypothesis is supported.

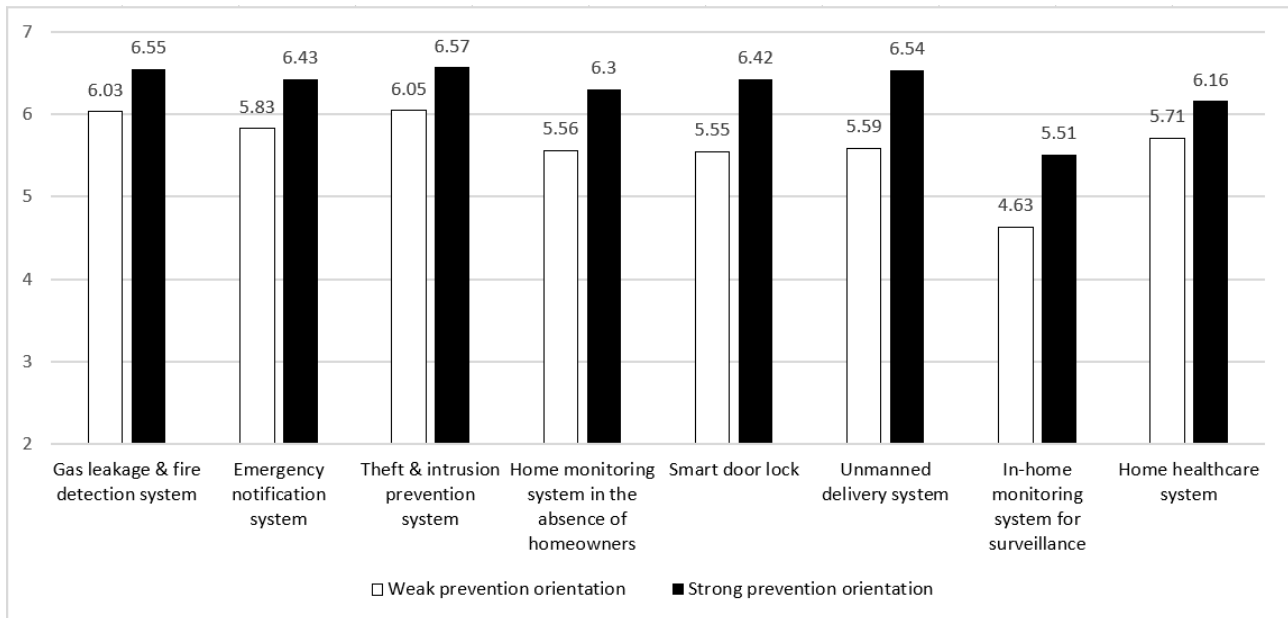


Figure 1. Overall attitude toward the smart home systems for safety and security

5. Conclusion

The present research examined whether individuals' attitudes toward smart home systems for safety and security differ according to their level of motivational orientation to prevention. Specifically, it was hypothesized that individuals with strong (vs. weak) prevention orientation will have more positive attitudes toward smart home systems for safety and security. Consistent with the hypothesis, it was found that respondents in the strong (vs. weak) prevention orientation reported significantly more positive attitudes toward eight types of smart home systems for safety and security.

In a theoretical perspective, we extend previous findings by demonstrating the impact of individuals' motivational orientation to prevention on their attitudes in the context of smart home systems for safety and security. In a practical perspective, the application of individuals' regulatory orientation may be particularly appealing to managers because of implementation ease [7]. Thus, given that applying the principle of regulatory fit can help to understand individuals' attitudes toward a variety of smart home systems, our findings imply that individuals' motivational orientation to prevention may be an effective marketing and segmentation tool in facilitating individuals' favorable responses to the smart home systems for safety and security. For instance, marketers can favorably affect consumers' attitudes toward smart home systems for safety and security by assessing the level of target consumers' motivational orientation to prevention (e.g., whether they have relatively weak or strong prevention orientation). Moreover, this research contributes to the positioning and communication of smart home services for safety and security. For example, since regulatory focus may be induced by external manipulation, marketers for smart home services for safety and security can frame communications to encourage prevention orientation, which may favorably influence consumers' attitudes and, subsequently, purchase likelihood.

Although this research provides theoretical and practical implications, it is not without limitations. First, instead of student samples, a more representative sample could enhance the generalizability of the findings.

Second, it would be good for future research to examine if the findings are applicable to other types of safety and security systems. Third, additional studies need to be conducted with individuals' regulatory orientation being manipulated. Finally, future research should consider other potential factors that can influence individuals' attitudes toward smart home systems for safety and security.

Acknowledgement

This work was supported by Hankuk University of Foreign Studies Research Fund of 2021.

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