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Investigating the Influence of Perceived Uncertainty on Protection Motivation: An Experimental Study

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Abstract

IS users and organizations must take necessary measures to adequately cope with security threats. Considering the importance and prevalence of these issues and challenges, IS security research has extensively investigated a variety of factors that influence IS users' security intentions/behaviors. In this regard, protection-motivated behaviors are primarily based on individuals' personal cognitive evaluations and vigilance. In reality, however, many users reach security hygiene decisions through various non-rational and non-protection-motivated processes. Such users may not necessarily rely on their own cognitive appraisals and information processing, but proceed to make decisions without careful cognitive assessments of security threats and coping responses. One promising lens for assessing these behaviors that may not be informed by rational and personal assessments of threats and responses is Herd Theory, which describes the phenomenon in which individual decisions are often influenced by other users' decisions about their behaviors. Drawing on this theory, this study seeks to answer the following research questions by using an experimental design: *In uncertain circumstances, are individuals more likely to cope with security threats by following the herd?*

Disciplines

Information Security | Management Information Systems | Technology and Innovation

SUMMARY

Information System (IS) assets are subject to diverse threats to security and privacy, including malware infection, data loss, compromised passwords, and identity theft, which are detrimental to organizational infrastructure, often leading to challenges to confidentiality, integrity, and data availability. In this regard, IS users and organizations alike must take necessary measures to adequately cope with the threats. Considering the importance and prevalence of these issues and challenges, IS security research has extensively investigated a variety of factors that influence IS users' security intentions/behaviors including threat appraisal, coping appraisal, fear appeals, subjective norms, and security-related self-efficacy.

Protection Motivation Theory (PMT) suggests that after receiving fear-arousing stimuli, individuals undergo two primary appraisal stages – threat appraisal and coping appraisal – that may contribute to protection motivation and intention to engage in responses recommended by the fear arousing stimuli such as fear appeals. A fear appeal initially triggers a threat-appraisal process in which the message recipient cognitively assesses his or her susceptibility or vulnerability to the stated threat, and then assesses the severity of that threat. Then, in the coping-appraisal stage, a person's response efficacy, perceived response cost, and self-efficacy determine the subsequent coping behavior. It should be noted that protection-motivated behaviors are primarily based on individuals' personal cognitive evaluations and vigilance. In reality, however, many users exhibit security hygiene-related behaviors through various non-rational and non-protection-motivated processes.

One promising lens for assessing these behaviors is Herd Theory, which describes the phenomenon in which individual decisions are often influenced by other users' decisions about their behaviors. Some of the IS users pay more attention to threats, enabling the proximal users (those with less security-related awareness and skills) to be less vigilant without decreasing their level of security. This has been found to guide individual behaviors in many contexts, but it has not yet been investigated in the context of responding to information security threats. Accordingly, we seek to answer the following research question: *In uncertain circumstances, are individuals more likely to cope with security threats by following the herd?*

According to Herd Theory, the processes of discounting one's own beliefs and the imitating of others when adopting new technologies or behavioral practices are prompted mainly by the observation of prior adoptions and uncertainty-related perceptions regarding the adoption of new technologies. IS security literature has been silent on how herd behavior can be substituted for

the traditional coping appraisal, or under what circumstances an individual faced with these environmental influences might respond according to the processes described by Herd Theory or by PMT. The ultimate goal of this study is to determine whether herd behavior can be a better theoretical lens than PMT in predicting and explaining home users' coping with security threats in highly uncertain circumstances. We employ a 2x2 experimental design and analyze data using covariance-based SEM (AMOS vs22). Overall, this paper aims to provide insights on how herd behavior can influence protection-motivation behaviors.