

The Curvilinear Effect of Supervisor Support on Employees' Proactive ISB

Early stage paper

Feng Xu

The University of Michigan-Dearborn
fengxu@umich.edu

Haisen Li

The University of New Mexico
lih@unm.edu

Carol Hsu

The University of Sydney
carol.hsu@sydney.edu.au

Xin (Robert) Luo

The University of New Mexico
xinluo@unm.edu

Abstract

Exploring the role of the supervisor in influencing employees' information security behavior (ISBs) is an important focus in information security (ISec) research and for organizations. However, the research identifying how supervisors motivate employees to participate in desirable security behaviors is scant. Drawing from self-determination theory and conservation of resources theory, this paper explores the curvilinear relationship between supervisor support and employees' proactive ISBs. Our findings contribute to current behavioral information security research and provide guidance on how supervisors motivate employees to actively participate in organizational information security management.

Keywords

Supportive supervision, proactive ISBs, proactive personality, self-determination, conservation of resources.

INTRODUCTION

In an increasingly complex and dynamic information security (ISec) environment, it is critical for the organization to leverage security capabilities to obtain competitive advantages. Since employees interact heavily with each other in the organization, employees' information security behaviors (ISBs) have been considered to be constructive for achieving organizational information security protection goals and improving the effectiveness of organizational information security policy (Hsu et al. 2015; Posey et al. 2013; Turel et al. 2020; Vance et al. 2015). Organizations have put great efforts into training and motivating employees to participate in protective ISBs. A substantial amount of ISec research has investigated the motivational factors to employees' protective ISBs, including sanctions (Cheng et al. 2013; Hovav and D'Arcy 2012), leadership or management support (Hu et al. 2012; Posey et al. 2015; Shropshire et al. 2015), social control (Hsu et al. 2015), etc. Among these factors, support from the management has been viewed as crucial in influencing employee protective ISBs but the role of management support needs further investigation.

First, previous ISec research focuses on general support (Shropshire et al. 2015) or ambiguous support (Hu et al. 2012) from the top managers. Compared with top managers, supervisors, as official agents of the organization, have the most interactions with employees and directly evaluate and affect employees' performance (Zhai et al. 2013). Although the supervisor plays a critical role in influencing employees' behaviors (Detert and Treviño 2010; Eby et al. 2015; Jiang et al. 2011), supervisor support has not received much empirical attention in ISec research. Second, non-ISec

studies have found the positive influence of management support on individual and organizational outcomes, such as employees' generalized compliance (Parker et al. 2006), citizenship behavior (Raineri and Paillé 2016; Thompson et al. 2020), proactive behavior (Ohly et al. 2006; Wu and Parker 2017), organizational innovation (Chen et al. 2016), etc. However, ISec research mainly investigated how management support improves employees' ISec policy compliance behavior (Goo et al. 2014; Hu et al. 2012). With the increasing uncertainty and risk of security threats, employees have been expected to identify potential threats in their daily work activities and change their work procedures to prevent future risks (NCSAM 2019). This type of behavior is self-initiated, change-oriented, and future-focused, which fits well with the characteristics of proactive behavior (Parker et al. 2010). The role of management support in motivating employees to participate in proactive ISBs has not been investigated. Third, previous ISec research has examined the linear relationship between management support and employees' ISBs (Goo et al. 2014; Hu et al. 2012). However, some studies showed that the relationship between management support and employee outcome might be more complicated than a simple linear relationship (Fuller et al. 2006; Ohly et al. 2006).

To address the above research gaps in ISec literature, we aim to explore how supervisor support influences employees' proactive ISBs. Drawing from self-determination theory (SDT) (Ryan and Deci 2000), we identified supportive supervision for ISec as important management support that can promote employees' proactive ISBs. Supportive supervision for ISec refers to supervision that concerns employees' security-related feelings and needs, encourages employees to voice their

security concerns, and provides positive and chiefly informational feedback regarding security issues (Oldham and Cummings 1996). Furthermore, it remains unclear whether supportive supervision for ISec has a linear positive relationship with employee proactive ISBs. Specifically, prior studies on management support and employee behaviors found different results. For example, several studies found management support positively influences employees' proactive behavior (Choi 2007; Ohly et al. 2006) while some studies found the relationship is insignificant (Baer and Oldham 2006; Fuller et al. 2006). The mixed effects showed that there might exist a possible curvilinear relationship. Drawing from the conservation of resources (COR) theory (Hobfoll 1989), we propose that supportive supervision for ISec may have a curvilinear relationship with employees' proactive ISBs. Specifically, when employees perceive lower supportive supervision for ISec, they are less likely to perform proactive ISBs because employees have nonsufficient resources to act proactively and overcome the risks and costs of proactive participation in information security protection activities. When perceived supportive supervision for ISec increases to a higher level, employees are more likely to employ more effort in engaging in proactive ISBs. That is, the effect of supportive supervision for ISec on proactive ISBs may be accelerated as supportive supervision for ISec increases from a moderate to a high level.

Moreover, the impact of management support on employees' outcomes might be influenced by employees' personal characteristics, such as proactive personality. Past studies showed that proactive personality has a crucial influence on proactive behavior and influences how employees respond to support resources (Hong et al. 2016; Parker et al. 2006). Employees with high proactive

personality rely less on external resources to engage in proactive behaviors. In contrast, employees with low proactive personality might be more likely to use external resources, such as support from the supervisors, as motivation to act proactively. Thus, this study proposes that proactive personality moderates the relationship between supportive supervision for ISec and proactive ISBs.

This study contributes to ISec literature in several aspects. First, proactive ISBs is crucial in protecting organizational information security because of the unique characteristics (self-initiated, change-oriented and future-focused). Although previous ISec research found the impact of management support on employees' compliance behavior (Goo et al. 2014; Guan and Hsu 2020), the role of management support in motivating employees to engage in proactive ISBs has not been investigated. This study extends the ISec literature by investigating how supportive supervision for ISec associates with proactive ISBs. Identifying the specific support that supervisors use to motivate employees' participation in proactive ISBs has critical implications for organizational information security management. Second, previous research on the relationship between management support and employee outcomes has shown inconsistent findings. Drawing on COR theory (Hobfoll 1989), this study explores a potential curvilinear relationship between supportive supervision for ISec and proactive ISBs. This study advances the understanding of the effect of management support on employee ISBs and provides a deeper examination of the role of management support. Third, the role of employees' individual differences (e.g., proactive personality) in influencing employees' ISBs has received less attention in the literature (Johnston et al. 2016). This study examines the moderating role of proactive personality in the relationship

between supportive supervision for ISec and proactive ISBs. Fourth, this study develops an integrated and multilevel research model that investigates both the impacts of department-level variables (e.g., supportive supervision for ISec) and individual-level variables (e.g., proactive personality) on employees' proactive ISBs.

THEORETICAL FOUNDATION AND HYPOTHESIS

Self-Determination Theory and Conservation of Resources Theory

SDT (Ryan and Deci 2000) argues that individuals are self-directed to satisfy needs of competence and autonomy. Autonomy focuses on individuals' sense of choice and self-determination and competence emphasizes the belief that individuals feel able to influence outcomes (Ryan and Deci 2000). The fulfillment of these fundamental needs is critical for the formation of individuals' intrinsic motivation. Such motivation encourages more proactive and creative activities because these activities are intrinsically satisfying (Gagné and Deci 2005).

It is encouraged to clearly analyze what supervisors should do to boost employees' sense of competence and autonomy. According to SDT, a central argument for the role of supervisor support in promoting proactive behaviors is that having support from the supervisor fosters a sense of self-determination in employees (Oldham and Cummings 1996). Typically, supervisors that create a supportive environment and treat employees in a supportive manner could increase the satisfaction of employees' psychological needs of competence and autonomy. Supportive supervision that encourages employees' voice, conveys confidence in employees' ability to handle challenging work, and provides informational feedback to employees helps employees gain a sense of competence and willingness to perform proactive behavior (Parker and Wu 2014).

COR theory (Hobfoll 1989) is a stress theory that describes individuals' motivation to preserve

and protect their current resources and pursue new resources. COR proposes that individuals may perceive stress when they are threatened with resource loss, or actually lose resources (Hobfoll 1989). Individuals might use resources to limit losses or gain resources. These recourses are critical for individuals to meet their needs and obtain goals (Halbesleben et al. 2014; Zhao and Guo 2019). For example, people might buy insurance to offset the potential loss in the future. COR helps explain the role of supervisor support in influencing employees' behaviors in the workplace.

Resources are often hard to gain so employees may seek support from external environments to offer resources they lack, especially when employees are expected to perform behaviors that are risky and stressful (Halbesleben et al. 2014; Hobfoll 1989). Through supervisor support employees can rely on supervisors to gain necessary resources and help them away from stressful circumstances. Employees could obtain resources in terms of personal characteristics, such as self-esteem, and social support, such as emotional help from supervisors. Resources obtained from supervisor support could help employees replenish diminished resources for performing activities, such as proactive behaviors, which might lead to resource loss.

The Relationship Between Supportive Supervision for ISec and Proactive ISBs

Drawing from SDT (Ryan and Deci 2000), we argue that the relationship between supportive supervision for ISec and employees' proactive ISBs is positive. Employees who perceive low supportive supervision may be more passive while working and feel a low sense of competence and autonomy. To initiate change-oriented behaviors, employees should have a high sense of self-determination because they need high autonomy and competence to deal with challenging tasks (Oldham and Cummings 1996).

Previous research suggests that encouragement from supervisors may promote employees to take

proactive actions (Madjar et al. 2002). That is, employees will have the confidence and motivation to perform proactively and enact changes in their work environment if they receive help and support from their supervisors (Chen et al. 2016; Oldham and Cummings 1996). Because supportive supervision involves a focus on employees' feelings and needs, encouragement of employees to have a voice, and the provision of positive feedback, it is thus expected to increase employees' self-determination and facilitate employee proactivity (Oldham and Cummings 1996). Thus, we argue that supportive supervision for ISec has a positive relationship with employees' proactive ISBs.

H1: Supportive supervision for ISec positively influence employees' proactive ISBs

Although we hypothesize a positive relationship between supportive supervision for ISec, this relationship might be nonlinear. Based on COR theory (Hobfoll 1989), people need to allocate resources to complete their tasks. Employees who perceive low supportive supervision might possess a nonsufficient level of resources to control their behavioral consequences. To perform proactive behaviors, employees need to obtain more resources to deal with potential risks and costs (Parker and Wall 1998). Therefore, a high level of supportive supervision for ISec might lead to more proactive ISBs than a low level of supportive supervision for ISec because employees obtain more resources under a high level of supportive supervision for ISec. However, we suggest this relationship only works until the level of supportive supervision for ISec reaches a certain point. As supportive supervision for ISec increases from the lowest to this certain level, employees might still obtain nonsufficient resources from supervisors and need to allocate their resources to overcome the potential risk of performing proactive ISBs. For example, an employee might take initiative to change work procedures to mitigate potential risks, but this activity might increase coworkers' efforts to complete collaborating tasks. If employees perceive that they don't obtain

sufficient resources from supervisors, they are less likely to perform proactive ISBs.

Furthermore, employees are more likely to perform proactive ISBs when the level of supportive supervision for ISec is beyond a certain point. Based on COR theory (Hobfoll 1989), when employees obtain sufficient resources, they tend to exert more effort to obtain additional resources such as satisfaction with others and favorable outcomes (Astakhova 2015; Hobfoll et al. 1990). Because proactive ISBs are beneficial for improving organizational and individual information security and strengthening relationships with supervisors, employees with high supportive supervision for ISec may obtain more resources by engaging in proactive ISBs (Oldham and Cummings 1996). Therefore, according to COR theory, employees who perceive high supportive supervision for ISec may be able to obtain more additional resources through engaging in proactive ISBs. As such, supportive supervision for ISec may have a positive impact on proactive ISBs when the level of supportive supervision for ISec is beyond a certain point.

Thus, we propose that the relationship between supportive supervision for ISec and proactive ISBs is curvilinear. We hypothesize that:

H2: There is a curvilinear relationship between supportive supervision for ISec and proactive ISBs such that the positive relationship between supportive supervision for ISec and proactive ISBs will be pronounced when supportive supervision for ISec is high.

The Moderating Effect of Proactive Personality

Although we argue that supervisor support relates to employees' behaviors, employees' personal characteristics might influence their responses to supervisor support. Previous ISec literature has revealed that personal characteristics might be an important factor in influencing employees' attitudes and behaviors toward information security (Johnston et al. 2016). We aim to investigate the role of proactive personality in shaping the relationship between supportive supervision for

ISec and employees' proactive ISBs.

Proactive personality refers to individuals' enduring behavioral tendency to be proactive (Parker et al. 2010). When employees have a high proactive personality, they become more motivated to initiate change based on their own ideas or suggestions and rely less on external resources to take proactive action (Fuller and Marler 2009). Supportive supervision for ISec enhances employees' perception of competence and autonomy to perform tasks (Oldham and Cummings 1996). Employees who perceive high supportive supervision for ISec are likely to be motivated to initiate change. However, employees with high proactive personality are predisposed to take proactive action and have a high sense of self-determination to perform proactive behaviors (Brown et al. 2006; Parker et al. 2006). Thus, they are less affected by supervisors' actions. In contrast, employees with low proactive personality rely more on supervisor support to increase their motivation to accomplish a proactive task. We thus expect that proactive personality weakens the relationship between supportive supervision for ISec and proactive ISBs.

H3: Proactive personality moderates the relationship between supportive supervision for ISec and employees' proactive ISB such that the relationship is stronger when proactive personality is low.

The curvilinear relationship between supportive supervision for ISec and proactive ISBs may also be influenced by employees' proactive personality. Based on COR theory (Hobfoll 1989), employees who perceive high supportive supervision for ISec are likely to exert effort in performing beneficial behaviors, such as proactive ISBs. However, performing proactive ISBs is a resource depletion process for employees. Increased proactive ISBs may lead to a sense of vulnerability when employees are skeptical that supervisors might not provide sufficient support for helping them complete tasks that is beyond their job requirements (Dirks and Skarlicki 2004;

Zhu and Akhtar 2014).

When employees doubt that their supervisors cannot provide sufficient support, they are less likely to allocate resources toward proactive ISBs, since they are not sure that their supervisors will respond positively to their behaviors (Dirks and Ferrin 2002). In contrast, when the level of supportive supervision increases from a certain point to high, employees become more willing to perform proactive behaviors because they are confident that their proactive behaviors could help them gain additional resources. However, employees with high proactive personality have high self-motivation and are predisposed to exhibit proactive behaviors rather than relying on cues from their supervisor (Fuller and Marler 2009). Thus, proactive personality might influence the pronounced effect of supportive supervision for ISec on proactive ISBs. When employees' proactive personality is high, employees have low motivation to react to supervisors' support. But when employees' proactive personality is low, employees need more support from supervisors to perform challenging tasks. High supportive supervision for ISec could increase employees' confidence that their proactive ISBs will bring additional resources in the future (Chen et al. 2016; Oldham and Cummings 1996). Consequently, the pronounced side of the curvilinear relationship between supportive supervision for ISec and proactive ISBs is weakened under high employees' proactive personality and strengthened under low employees' proactive personality.

H4: Proactive personality moderates the curvilinear relationship between supportive supervision for ISec and employees' proactive ISB such that the pronounced side is strengthened under low proactive personality, whereas the pronounced side is weakened under high proactive personality.

METHODOLOGY

Sample and Procedure

This study aims to estimate a multilevel model that includes department-level variables and

individual-level variables to investigate the effects on departments and employees nested in departments. Participation in this study will be full-time employees working in various departments across industries.

Each participant will be asked to complete a questionnaire that measures employees' perception of supportive supervision for ISec, proactive personality, proactive ISBs, control variables, and demographic information. Participants will be paid to motivate employees' participation in the survey.

Measures

The measurement of proactive ISBs was adapted from Morrison and Phelps (1999) and Hofmann et al. (2003) and the measurement of supportive supervision for ISec was adapted from Tucker et al. (2008) and Wu and Parker (2017). The measurement of proactive personality was adopted from Claes et al. (2005).

We will aggregate employees' ratings of supportive supervision for ISec to create a department-level variable and calculate the value of the average rwg (j), ICC (1) and ICC (2). We also control the impact of age, gender, and job autonomy. These factors have been found to influence employees' proactive behaviors (Bolino and Turnley 2005; Den Hartog and Belschak 2012; Parker et al. 2006; Thomas et al. 2010).

Data Analysis

We will use AMOS 28.0 to test the reliability and validity of the constructs. We will conduct a confirmatory factor analysis (CFA) to examine the distinctiveness among these constructs. And we

will use SPSS 28.0 to test the multilevel research model. Previous studies show that the mixed method in SPSS could incorporate random effects into the model and is appropriate for multilevel data analysis (Brouthers et al. 2014; Quené and Van den Bergh 2004). SPSS mixed method has been used in several studies (Coelho and Romão 2018; Dumas and Perry-Smith 2018; Quinones and Griffiths 2017).

DISCUSSION

Management support has become increasingly pivotal in motivating employees' ISBs. Drawing on SDT and COR theory, we build a multilevel model to explore how supportive supervision for ISec interacts with employees' proactive personality to influence employees' proactive ISBs.

Theoretical and Practical Contributions

This study contributes to ISec literature in several ways. First, the study identifies the relationship between supportive supervision for ISec and employees' proactive ISBs. Although prior studies have estimated the important impact of management support on desirable ISBs such as compliance (Goo et al. 2014; Hu et al. 2012), there is still a lack of investigation of how supervisors or managers motivate employees to engage in ISBs that is beyond compliance. Second, our study advances behavioral ISec research by investigating the curvilinear relationship between supervisor support and employees' ISBs. Third, our study makes contributions to ISec literature by integrating an individual difference (i.e., proactive personality) to investigate the relationship between supportive supervision for ISec and proactive ISBs. This enhances the understanding of which types of employees are more or less likely to perform proactive ISBs under supportive supervision

for ISec. This study provides interesting implications for managers or supervisors to motivate employees to engage in ISBs that are beyond compliance. Encouraging employees' participation in ISBs that are self-initiated, change-focused, and future-oriented provides meaningful guidance for organizations to improve the effectiveness of organizational information security protection.

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