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The moderating roles of gender and social norms on the relationship between protection motivation and risky online behavior among in-service teachers



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ABSTRACT

Online safety problems, such as computer virus infections, malicious software, phishing and personal data theft or leakage, have worsened in recent years and are often exacerbated by Internet users' thoughtless online behavior. In-service teachers, particularly those in compulsory education, constitute a population of Internet users that is seldom investigated. Nevertheless, teachers play a vital role in shaping adolescents' online safety behavior and can impart the concepts of online safety to students through their interactions in daily life. Consequently, the motivations for teachers' risky online behavior warrant further investigation. The findings of prior studies involving online safety behavior based on protection motivation theory (PMT) have been mixed, which suggests the existence of moderating factors. The present study recruited 505 in-service teachers and examined the moderating roles of gender and social norms based on PMT using a multi-group analysis. We also conducted qualitative interviews to corroborate the results of the statistical analysis. The results indicate that to prevent teachers from engaging in risky online behavior, it is necessary – but not sufficient – to enhance teachers' skills in coping with online safety problems or to create a climate that encourages them to adopt protective measures. The role of coping self-efficacy varied with perceived social norms, and the function of perceived response efficacy was contingent on gender. The implications for the theoretical understanding of and practical suggestions for online safety education are discussed.

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1. Introduction

Online safety problems, such as computer virus infections, malicious software, phishing and personal data theft or leakage, have worsened in recent years and are often exacerbated by Internet users' thoughtless online behavior. According to statistics published by the [National Communication Commission \(2016\)](#) in Taiwan, the average number of reported online safety incidents is approximately 4000 per month. If trivial and unreported incidents are considered, this number of online safety incidents might be underestimated.

Protection motivation theory (PMT) ([Maddux & Rogers, 1983](#); [Rogers, 1975](#)) is often adopted to investigate online safety behavior. PMT helps to explain why people engage in risky behaviors given the severity and vulnerability of potential

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incidents. In PMT, the protection motivation is aroused based on a coping and threat appraisal; people then decide to respond adaptively or maladaptively (to protect or not to protect the self). The coping appraisal refers to the judgment of one's capability to cope with the threat, and the threat appraisal involves evaluating the factors relating to the responses that evoke danger (Rippetoe & Rogers, 1987). For example, a person's habit of publicizing his daily activities online is a maladaptive response in consideration of privacy protection. This person will appraise the psychological pleasure of showing off or the danger of disclosing personal data and will then decide to adjust the privacy settings or continue such behavior. However, findings from online safety studies based on PMT appear to be mixed (see Appendix 1). In this case, a cross-sectional survey is inadequate, and qualitative research is suggested as an alternative. Additionally, since motivation varies from one occasion to another, the moderating effects of different factors should be explored so that we can identify factors that contribute to these inconsistent results. A meta-analysis of PMT and several PMT studies have proposed population characteristics as a potential source of this heterogeneity (Floyd, Prentice-Dunn, & Rogers, 2000; Lwin, Li, & Ang, 2012; G. R.; Milne, Labrecque, & Cromer, 2009). Gender has been shown to contribute to the disparity in users' Internet attitudes and behaviors (e.g., Chou, Wu, & Chen, 2011; Wu, 2014; see also the following literature review). Another study suggested that social norms relate to this behavior as well (Sheeran & Taylor, 1999). Social norms refer to an individual's belief in what particular others (e.g., friends) do or think the person should do, which is a vital predictor of Internet behavior (e.g., Anderson & Agarwal, 2010; Hofstra, Corten, & van Tubergen, 2016). These two factors were thus chosen as possible moderators in the current study.

Past PMT studies focused more on adaptive behavior than maladaptive and risky behavior (S. Milne, Orbell, & Sheeran, 2002) partly because the goal of PMT studies is usually to convince people to follow their recommendations (Floyd et al., 2000). That is, adaptive behavioral intentions are indicative of persuasion effectiveness. However, risky behavior is worthy of investigation, especially when the norm is not fully established. What the research categorizes as risky behavior, such as posting personal data on social networking sites, is often perceived as a desirable activity among the public (G. R. Milne et al., 2009). Research is thus needed to examine the factors that lead to an individual's decision to continue such behavior. Regarding technology use, teachers play a vital role in shaping adolescents' online safety behavior (Chou & Chen, 2016). However, some teachers possess indiscreet attitudes toward information technology use. The teachers admitted to using unlicensed software, accessing others' computers and sending emails with viruses (Beycioglu, 2009). Consequently, we investigated the motivations for teachers' risky online behavior and how these behaviors are moderated. We relied on the measurement model validated by Chou and Chou (2016) to explore the moderating roles of gender and social norms. We also conducted qualitative interviews to develop a deeper understanding of how teachers' risky behaviors are triggered. We hope that the results will guide the design of online safety training programs for teachers.

2. Literature review

2.1. Protection motivation theory

PMT was first proposed by Rogers (1975) and revised by Maddux and Rogers (1983) and Rogers, Cacioppo, and Petty (1983) drawing on social cognitive theory (Bandura, 1977). A combination of the perceived severity and perceived vulnerability of a given event, the perceived efficacy and self-efficacy of undertaking a protective response, and the perceived costs of engaging in a protective behavior or the perceived rewards of engaging in a risky behavior will initiate a subject's cognitive appraisal process to mediate attitude changes. The individual will take action based on the judgment of this process.

According to Rogers (1975), perceived severity is the noxiousness of a threat given the circumstances, and perceived vulnerability consists of an individual's judgments regarding the probability of a threat occurrence. Response efficacy and self-efficacy are characterized as an individual's belief in the efficacy of a coping response (Maddux & Rogers, 1983). The former indicates how effective a recommended action would be when coping with the threat, and the latter involves the individual's confidence in his/her competence in undertaking that action. An individual's cognitive appraisal of the above-mentioned factors determines whether he or she will engage in the recommended behavior. Adaptive response costs refer to the inconvenience or difficulty of engaging in the suggested coping behavior. Maladaptive response rewards include benefits such as internal satisfaction or social approval when engaging in risky (or at least inadvisable) behavior. Maladaptive response rewards increase the likelihood of engaging in a maladaptive action, whereas adaptive response costs decrease the likelihood of engagement (Maddux & Rogers, 1983). Hereafter, we call these factors sub-constructs of PMT. The basic PMT model is illustrated in Fig. 1. In addition to the main effect of the aforementioned factors, interaction effects derived from self-efficacy and from response efficacy have been noted (Maddux & Rogers, 1983). Floyd et al. (2000) and Sheeran and Taylor (1999) also proposed population characteristics as a potential source of heterogeneity.

2.2. Relationships between online safety behavior and sub-constructs of PMT

PMT is currently widely applied to predict online behavior, both protective and risky. Researchers have investigated classical protection motivation and have incorporated additional factors into their studies (Anderson & Agarwal, 2010; Workman, Bommer, & Straub, 2008). In the field of education, different populations from various cultures have been surveyed, including on-the-job university students, university students, and high-school students. In general, the findings of online safety studies based on PMT appear to be inconsistent (detailed relationships between online safety behavior and the sub-constructs of PMT are listed in the Appendix).

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