Full Length Article

Revisiting fear appeals: A structural re-inquiry of the protection motivation model

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ABSTRACT

Replicating Johnston and Warkentin (2010), we demonstrate that social influence and self-efficacy are the main drivers of compliance with fear appeals. Contrary to the original study, we find that the acknowledgment of a severe threat encourages subjects to seize on the proposed recommendation, bolstering perceptions of efficacy. With this sole exception, the original results are fully replicated in a different research context employing a different population.

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1. Introduction

Fear appeals are communications presenting the threat of impending danger to motivate compliance with a proposed recommendation (Keller & Lehmann, 2008). The Protection Motivation Model (PMM: Maddux & Rogers, 1983), widely employed in marketing (e.g., Pechmann, Zhao, Goldberg, & Reibling, 2003), identifies the drivers of compliance in the audience's assessment of a) threat severity, b) threat susceptibility, c) efficacy of the coping response, and d) self-efficacy in adopting the proposed coping response. Previous meta-analyses, however, show weak direct effects of threat severity and threat susceptibility on behavioral intentions (e.g., Milne, Sheeran, & Orbell, 2000).

The current paper presents a conceptual replication of Johnston and Warkentin's (2010) structural model of the PMM, in which the effect of threat severity and threat susceptibility on behavioral intentions is mediated by coping response efficacy and self-efficacy. In addition, we extend the original model by including the relationship between coping response efficacy and self-efficacy. The provision of a clear solution to a problem is likely to increase self-efficacy, as the audience is lead to believe that they can cope successfully with the threat by adopting the recommended course of action.

The replication of the original model notably underlines a) a negative effect of threat severity on both measures of efficacy and b) poor goodness-of-fit indices, not reported in the original study due to the component-based approach undertaken (i.e., partial least squares). An alternative model demonstrates higher reliability.

2. Method

2.1. Design, sample, and procedure

A single-factor (Stimulus: Treatment vs. Control) between-subject design was used to assess the effectiveness of a fear appeal on intentions to comply with online banking security behaviors. Three-hundred-and-seventy U.S. citizens (43% female) that reported using online banking at least once a month were recruited from Amazon Mechanical Turk in return for a small incentive (see Paolacci, Chandler, & Ipeirotis, 2010). The majority of respondents were in the 18 to 29 age group (43.8%), followed by the 30 to 39 age group (29.5%).

Participants were randomly assigned to one of the two experimental conditions. The first group ($n = 250$) was exposed to the fear appeal, whereas the second group ($n = 120$) served as the control group. Following the procedure outlined in the original study, the sample size for the treatment condition was significantly larger than the control group to allow the subsequent SEM analysis (Johnston & Warkentin, 2010). Next, participants were asked to report their perceived severity and susceptibility to online banking fraud, the perceived efficacy of some common security tips, the perceived self-efficacy to implement them, the opinion of important others regarding online banking fraud, and their intentions to adopt protective actions in the following three months.

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Table 1
Original and replicated mean differences for the experimental conditions.

Original ANOVA results			
Variable	Treatment	Control	F-test
	Mean (SD)	Mean (SD)	
Threat severity	3.93 (–)	3.59 (–)	13.719***
Threat susceptibility	3.69 (–)	3.22 (–)	9.521***
Coping response efficacy	4.07 (–)	3.71 (–)	3.432***
Self-efficacy	3.74 (–)	3.54 (–)	9.026***
Social influence	–	–	–
Behavioral intentions	–	–	–

Replicated ANOVA results				
Variable	Treatment	Control	F-test	Comparison with original results
	Mean (SD)	Mean (SD)		t-Test
Threat severity	4.24 (0.88)	4.04 (0.90)	3.943*	− 16.73***
Threat susceptibility	3.20 (0.82)	2.80 (0.83)	18.780***	− 9.11***
Coping response efficacy	4.09 (0.66)	3.87 (0.77)	8.550**	− 20.30***
Self-efficacy	4.08 (0.66)	3.83 (0.70)	11.172**	7.89***
Social influence	3.44 (1.07)	2.91 (1.13)	18.938***	–
Behavioral intentions	3.88 (0.98)	3.28 (1.14)	27.247***	–

Note: – = not reported.
*** $p < .001$.
** $p < .01$.
* $p < .05$.

2.2. Stimulus

The message employed in the fear appeal condition consisted of a short online banking security message stressing the risk of online bank fraud and providing a list of security actions aimed at reducing this risk. The ad presented different typologies of online banking frauds as the threat. Statements describing the risks of money and identity theft were included to stress the severity of said frauds. Similar to the original study, concerns of susceptibility to the threat were framed by including statistics detailing the pervasive nature of online banking frauds. The coping responses included in the message elucidated various strategies to prevent online banking frauds. The effectiveness and ease of implementation of these security tips supported coping response efficacy and self-efficacy. An expert group consisting of four between faculty members, doctoral students and practitioners evaluated the content validity of the message and deemed it both valid and comparable to the original stimulus. The stimuli employed in the original and replicated studies are available in the Supplementary materials — Part 1.

2.3. Measures

We measured six latent constructs on five-point Likert scales using the original items (Johnston & Warkentin, 2010), with the exception of social influence (see Supplementary materials — Part 2 for more information on the measurement of social influence). Internal consistency

(Cronbach's α) was good for threat severity ($\alpha = .91$), threat susceptibility ($\alpha = .77$), coping response efficacy ($\alpha = .78$), behavioral intentions ($\alpha = .97$), and slightly below the optimal threshold for self-efficacy ($\alpha = .65$). The Spearman–Brown's r for social influence was satisfactory ($r = .81$). Items were averaged into single-factor indicators for the first part of the study, and treated as factors loading on latent variables for the second part.

3. Results

3.1. Between-subjects tests

An analysis of variance (ANOVA) between the two experimental conditions confirmed the original results. In comparison to the control group, participants exposed to the fear appeal reported higher perceptions of threat severity, threat susceptibility, coping response efficacy and self-efficacy. Participants also reported higher perceptions that important others would endorse the protective behavior and higher intentions to adopt it. Table 1 summarizes these results.

The results of a two-non-reunited samples t-test suggest that the stimulus employed in the original study had a greater effect on the variables of interest, in comparison to the stimulus employed in the replication (Table 1). This difference arguably depends in part on the inherent features of the stimuli employed in both studies, and in part on the different context and population investigated in the replication.

3.2. Replicated and alternative structural models

The second part of the replication investigated the effects of the PMM variables on behavioral intentions for the fear appeal condition only. We tested the original model with maximum likelihood estimation using AMOS 21. Instrument validity tests were conducted to ensure convergent and discriminant validity. All items loaded significantly on their respective factors and the average variance extracted (AVE) of each factor was greater than .50 (except self-efficacy was .47), providing evidence of convergent validity (Bagozzi, Yi, & Phillips, 1991). Discriminant validity was assessed by comparing the shared variance between each pair of constructs against the AVE of each construct. Since the AVE of each construct was greater than its shared variance with any other construct, evidence for discriminant validity was provided (Fornell & Larcker, 1981). Table 2 provides correlations, shared variances and average variances extracted for each latent construct. The fit indices for the measurement model including all six latent constructs were good ($\chi^2/df = 193.87/103 = 1.88$; GFI = .91; CFI = .97; RMSEA = .060; PNFI = .71).

First, we tested our data against the original model, replicating the original results with two exceptions. In the replicated model, the standardized regression weights (β) of the structural paths linking threat severity to coping response efficacy ($\beta = .239$) and self-efficacy ($\beta = .193$) were both positive, whereas Johnston and Warkentin (2010) report negative βs. In addition, the replicated model fitted the data poorly (Table 3).

We then tested an alternative model. One expected reason for the poor fit of the replicated model was the omission of a path linking coping response efficacy to self-efficacy, which was included in the

Table 2
Correlations, shared variance, and average variance extracted.

	Threat severity	Threat susceptibility	Response efficacy	Self-efficacy	Behavioral intentions	Social influence
Threat severity	**.846**	.044	.044	.027	.075	.022
Threat susceptibility	.210	**.533**	.145	.001	.048	.061
Response efficacy	.211	− .065	**.618**	.405	.145	.043
Self-efficacy	.164	− .038	.637	**.468**	.163	.034
Behavioral intentions	.275	.220	.381	.404	**.917**	.285
Social influence	.148	.248	.207	.184	.534	**.846**

Note: r = below the diagonal, r^2 = above the diagonal in *italic*; AVE = on the diagonal in bold.