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The Power of Fear in Prevention Campaigns: Evaluating the Effectiveness of Loss and Coping Appeals on Pickpocketing Prevention Behavior

THOMAS N. FRIEMEL[1]
University of Zurich, Switzerland

DENNIS REICHOW
University of Bremen, Germany
University of Zurich, Switzerland

All over the globe, public transport operators face a high level of pickpocketing and the challenge to address this topic through communicative actions. However, little is known about the effectiveness of preventive messages. Informed by health communication theories and based on an online experiment (N = 1,938) with a between-subject design, we found that a loss appeal increased the motivation to protect against pickpocketing, while no difference was found between the coping appeal and the control group. As suggested by the extended parallel process model (EPPM), the structural equation model supports the hypothesized crucial role of fear in inducing protection motivation. However, in contrast to the theory, no differences were found for the processes induced by the different messages. Based on these findings, we discuss the power of fear in prevention campaigns and the opportunities and challenges it presents for campaign practices regarding pickpocketing and other topics of prevention behavior.

Keywords: extended parallel process model, preventive campaign messages, efficacy, threat, fear, public transport, pickpocketing

Passengers on public transport are one of the most popular targets for pickpockets; large crowds of people facilitate thefts, and thieves are able to escape without being noticed (Du, Liu, Zhou, Hou, & Xiong, 2016). These pickpockets are a great challenge to public transport operators and police because high crime rates diminish passengers' satisfaction and eventually discourage many potential customers from using public transport (Solymosi, Bowers, & Fujiyama, 2015). To reduce crime rates, public transport operators therefore

Thomas N. Friemel: th.friemel@ikmz.uzh.ch
Dennis Reichow: d.reichow@gmx.net
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apply communication campaigns. Operators use stickers, posters, loudspeaker announcements, and other communicative channels to increase passengers' awareness and induce behavior change (i.e., being more attentive). These campaign messages typically come as security warnings to alert the passengers. However, it has not been empirically tested whether these threat-inducing messages are the most effective way to improve protection behavior, reduce crime rates, and make public transport more secure.

In health communication research, there is a long-standing discussion on how to design the most effective messages to induce behavior change (Rice & Atkin, 2013). In the literature, two general message strategies are often distinguished: positive messages that focus on a potential solution and/or positive outcome of a behavior change versus negative messages that emphasize the danger and negative consequences if one does not perform a certain behavior. This approach of emphasizing a specific perspective on a topic is referred to as message framing and has been found to be decisive for media effects. However, empirical findings also show that the effectiveness of gain- and loss-framed messages can differ with regard to the respective risk (Gallagher & Updegraff, 2012; O'Keefe & Jensen, 2007, 2008; Rothman, Bartels, Wlaschin, & Salovey, 2006; Rothman & Updegraff, 2011; Salovey, Schneider, & Apanovitch, 2002). Therefore, an empirical investigation of different types of message framing in the context of public transportation security is advisable. This study builds on the extended parallel process model (EPPM; Witte, 1992), which proposes perceived efficacy, fear, and perceived threat as central factors in message processing that thereby influence the effectiveness of a message. This allows us to address the mentioned research gap and answer the respective research question to determine which message strategy is more likely to be effective in increasing protection motivation regarding pickpockets on public transport (RQ1). Furthermore, this theoretical approach allows us to assess the role of fear in message processing regarding pickpockets on public transport (RQ2) and to investigate potential differences in message processing regarding gain- and loss-framed messages for this topic (RQ3). Our empirical approach is based on an online experiment (N = 1,938) with a one-factorial between-subject design, testing the effect of two campaign messages (i.e., a gain-framed message that includes coping appeals to increase perceived efficacy vs. a loss-framed message that addresses perceived threat) on message processing, protection motivation, and reactance. Furthermore, we compare the effects of these two message strategies on protection motivation with a control group to assess the potential impact of a respective campaign and thereby guide future intervention strategies.

Message Strategies for Prevention Campaigns

Prospect theory (Kahneman & Tversky, 1979) suggests that people come to different decisions regarding a risk depending on how risk-related information is presented. Generally speaking, valence framing distinguishes between positive and negative portrayals of risks and behavioral options to cope with these risks. As shown by Levin, Schneider, and Gaeth (1998), several subtypes of valence framing need to be distinguished. A meta-analytic review of three types of valence framing revealed that so-called goal framing has the strongest effects on recipients (Piñon & Gambara, 2005). Goal framing highlights the consequences or implied goals of a certain behavior: A positive frame can emphasize the goal to obtain a gain and/or avoid a loss, while a negative frame focuses on the potential consequence of forgoing a gain and/or suffering a loss. Hence, regarding the topic of pickpocketing, one could apply the positive frame of

avoiding a loss (e.g., "paying attention protects you from pickpocketing") or the negative frame of suffering a loss (e.g., "you are susceptible to a serious loss on public transport").

Comparable to this distinction of positive and negative goal framing, several health communication theories distinguish between efficacy and threat as the two most important factors influencing prevention behavior—for example, protection motivation theory (PMT; Rogers, 1983); the health belief model (HBM; Rosenstock, Strecher, & Becker, 1988); and the theory of planned behavior (TPB; Ajzen, 1991). According to these theories, the effect of positive goal framing can be achieved by emphasizing the effectiveness and/or self-efficacy of how to cope with a risk. Given that people do not gain something, but rather cope with the risk of pickpocketing, we refer to messages framed this way as *coping appeals* in this article (instead of gain frame). Alternatively, a negative frame could address the likelihood and/or severity of suffering a loss. Messages framed this way are called *loss appeals* in this article.

The EPPM and the Role of Fear in Campaign Messages

The parallel processing model—a predecessor of the EPPM—introduced the assumption that messages addressing a risk produce two separate and potentially interdependent processes (Leventhal, 1970). The theory suggested that cognitive responses (focusing on threat) would foster message acceptance, whereas affective/emotional responses (experiencing fear) would engage maladaptive outcomes. The EPPM was developed based on this theoretical and empirical work (Witte, 1992, 1994). In short, the model suggests that people will take one of two routes of message processing when perceiving a risk: danger or fear control. Whereas danger control motivates individuals to reduce the risk and leads to the desired protection motivation, fear control results in reactance toward the message to reduce the perception of the risk. Threat and efficacy are assumed to be the two factors driving this process. Building on PMT (Rogers, 1975, 1983), Witte distinguishes two subdimensions for threat and efficacy. Threat is assumed to consist of the two subdimensions of perceived severity and susceptibility. Severity refers to the perception of the magnitude of an addressed risk and susceptibility to the perceived likelihood of experiencing that risk. Efficacy consists of two subdimensions as well: response efficacy and self-efficacy. Response efficacy refers to the individual perception of how effective a recommended behavior will be in avoiding a risk, and self-efficacy refers to the perceived ability to actually perform this behavior. Witte assumed that the evaluation processes are sequential: First, when a message (stimulus) is perceived, a cognitive appraisal is carried out, which evaluates the extent of the threat. If this threat is considered low or irrelevant, there is no further processing of the message. If the recipient perceives a threat, fear arises, which motivates further processing of the message. In this second stage, the level of efficacy is important. If efficacy is perceived as high, danger control results, and people will adapt their behavior (e.g., protect against pickpocketing). However, when efficacy is low, people will develop high levels of fear that result in fear control and maladaptive behaviors, such as reactance and message minimization. In sum, fear is assumed to play a central role in message processing, and an increased protection motivation will result only if the right levels of threat and efficacy are met.

The EPPM was applied to a variety of health behavior topics (Li, 2018; Shi, Wang, Peng, & Chen, 2019; Witte, 1997) and other areas of social marketing such as road safety (Lewis, Watson, & White, 2013), distracted driving (Diegelmann, Ninaus, & Terlutter, 2020), and environmental protection (Perrault & Clark,

2018). Most studies compare several messages with different degrees of threat and efficacy to identify the most effective mix of threat and efficacy appeals. However, it is important to note that perceived threat and efficacy are always related to the risk and the protection behavior, and not the message per se. Hence, perceived threat and efficacy are dependent not only on the message, but also on preexisting attitudes. Based on these preexisting attitudes, people will experience a certain level of threat and efficacy regarding a risk even if the stimulus does not address these dimensions explicitly. Therefore, it is crucial to include a control group to evaluate not only whether protection motivation differs among message designs, but also whether it can be raised at all with persuasive messages. However, a literature review shows that only a few experiments addressing EPPM include a control group (Popova, 2012).

Research Questions and Hypotheses

Given the high number of pickpockets on public transport, the pertinent role of persuasive messages in altering people's prevention behavior, and the ongoing discussion regarding the effectiveness of different message framings, we tested different message strategies against each other and against a control group. Informed by PMT and HBM, the two messages focus on threat and efficacy as the two central dimensions of preventive messages (i.e., loss and coping appeals). Based on EPPM, the two message strategies are furthermore assumed to affect different processing and behavioral outcomes (i.e., fear control vs. danger control). The intent of the first message is to increase perceived threat by a loss appeal. The intent of the second message is to increase perceived efficacy by a coping appeal (see the Methods section). In this study, we focus on protection motivation instead of observing actual behavior, given that various theories of behavior change suggest that behavioral intentions are an important prerequisite for effective behavior change (Ajzen, 2011; Madden, Ellen, & Ajzen, 1992). Hence, our first research question can be specified as follows:

RQ1: Are loss or coping appeal messages more effective in increasing protection motivation regarding pickpocketing on public transport?

Although the empirical research on the effects of fear appeals remains inconsistent (O'Keefe & Jensen, 2008), we follow the basic assumptions of the EPPM. According to Witte (1994), fear appeals, which focus on threat and neglect efficacy and coping components, lead to the fear control process and evoke reactance. This is also supported by the fact that protection against pickpocketing can be categorized as protection behavior, for which gain frames are found to be more effective (Rothman et al., 2006). Therefore, we assume that coping appeals, which emphasize efficacy, lead to a higher level of protection motivation, whereas loss appeals, which solely focus on severity and susceptibility, produce a higher level of reactance:

H1: The coping appeal message will produce higher protection motivation than the loss appeal message.

H2: The loss appeal message will produce more reactance than the coping appeal message.

The EPPM proposes a specific sequential order of message processing. If fear is below a certain threshold, the efficacy appraisal will not begin, and if perceived efficacy is too low, protection motivation will not be increased. This distinct sequential order is difficult to assess and has therefore never been tested in

detail. However, if the assumptions of a first and second appraisal are correct, we should find different patterns for coping and loss appeals in a structural equation model. Therefore, our second research question is:

RQ2: Do coping and loss appeals lead to a different pattern in an empirical model and therefore support distinct processes, as suggested by the EPPM?

In a third step, we investigate the role of fear in message processing regarding pickpockets on public transport (RQ3). Based on the tenets of EPPM, this includes the following hypotheses:

H3a: Perceived efficacy is positively related to protection motivation.

H3b: Perceived efficacy is negatively related to fear.

H3c: Perceived threat is positively related to protection motivation.

H3d: Perceived threat is positively related to fear.

H3e: Fear is positively related to reactance.

Furthermore, we propose a direct path between fear and protection motivation. Although Witte (1994) reported a significant effect of fear on protection motivation, this path was not included in the original model that addressed behavior as a dependent variable. Because we focus on protection motivation as the dependent variable, we also test for a direct path from fear to protection motivation:

H3f: Fear is positively related to protection motivation.

Figure 1 shows the proposed theoretical model and the associated hypotheses.

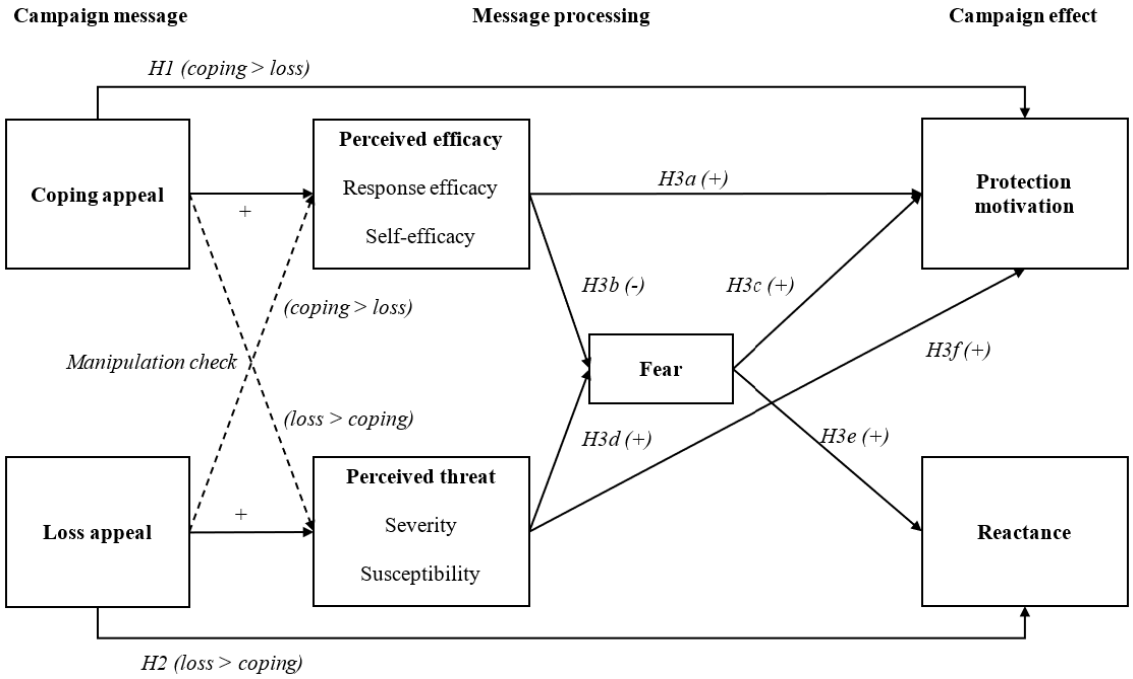

Figure 1. Proposed theoretical model and hypotheses.

Methods

Procedure and Participants

To assess the effects of coping and loss appeals on protection motivation, we employed an online survey that is representative (quota) for gender, age, and place of residence (federal states of Germany). Participant sampling was conducted by a professional research company (Infas) from April 10 to April 24, 2018. A total of 2,267 adolescents and adults between the ages of 16 and 87 (M = 48.5, SD = 16.6) were interviewed. Fifty-three percent were female. Both users and nonusers of public transport were included. For the present analyses, only regular public transport users were considered, resulting in a final sample of 1,938 participants. Table A1 in Appendix shows the demographic quota and the composition of the final sample.

Experimental Design

To test our hypotheses, we designed a unifactorial experiment with two factor levels, which was integrated into the online survey. A between-subject design was used, and all participants were randomly assigned to one of three groups (two experimental conditions, coping appeal and loss appeal, and a control group). To evaluate whether our messages were effective in increasing protection motivation at all, the control group did not see either of the two messages. Participants began the survey by answering general questions about their public transport use. The experimental groups continued with forced exposure to one of the two posters that were embedded as pictures and answered questions regarding the posters (i.e.,

reactance). There was no maximum time limit for exposure to the poster, but we technically set the minimum viewing time to 30 seconds. All other dimensions were measured identically for all three groups (i.e., including the control group) at the end of the survey. This included the perceived efficacy to prevent pickpocketing on public transport (i.e., self-efficacy, response efficacy), perceived threat of this risk (i.e., severity, susceptibility), fear of being robbed, and their protection motivation.

Message Manipulations

Given that the goal of this study was to test whether coping and loss appeals lead to different patterns in an empirical model (RQ2) and not to localize the critical point at which danger-control processes turn into fear-control processes (Witte, 1992), we did not include multiple nuances of coping and threat appeals. Therefore, we focused on the development of a message with a clear coping appeal and one with a loss appeal. It should be noted that the topic of pickpocketing is a prevalent issue among public transport passengers, and addressing this issue may increase preexisting threat levels by its very nature. At the same time, people are likely to have a preexisting perception of their efficacy in protecting themselves. Hence, any coping appeal regarding a risk may also evoke threat perception.

The development of the stimulus material was guided by the goal of high external validity. This means that the stimuli should be regarded as plausible posters by the participants and as potential campaign materials by public transport providers. For this reason, the posters were designed in coordination with the communication officers of German public transport companies. Icons and fonts were adapted from print products that have already been used on public transport. The logo of the national railway provider was also included.

Different pictograms and text messages were evaluated in a pretest to assess their potential to manipulate perceived efficacy and threat. Based on a pretest with students (n = 157), two messages were selected that have an obvious coping/loss appeal and that were likely to manipulate efficacy and threat perceptions in the main study. Both posters consisted of a catchphrase and a pictogram (see Figure A1 in Appendix). One poster included an explicit coping appeal by highlighting the implied positive consequences of avoiding theft and used optimistic, nonthreatening language ("Thieves won't stand a chance if your bag is closed") and calm colors (blue and white). The pictogram showed a closed handbag. The loss appeal focused on the negative consequences and used vivid language ("500 euro gone in just 5 seconds, 500 times a day") and signal colors (red and yellow). The pictogram illustrated the process of a theft.

Measures

All items and constructs were tested in a pilot study (n = 157 students). In this pretest, Cronbach's alpha ranged from .62 to .91. Subsequently, items were revised, which led to a significantly improved internal consistency in the reported study (alpha ranging from .81 to .93; see Table 1).

Table 1. EPPM Measurement.

Scale	*M*	*SD*	α	CR	AVE
Self-efficacy	3.38	0.91	.81	.82	.60
Response efficacy	2.98	0.10	.93	.93	.81
Severity	4.35	0.76	.86	.86	.67
Susceptibility	3.77	0.91	.86	.86	.68
Fear	3.91	1.16	.92	.92	.80
Reactance	1.99	0.95	.81	.81	.59
Protection motivation	3.70	0.98	.92	.92	.79

Note. *N* = 1,291 (only experimental groups, given that reactance was not measured for the control group); α = Cronbach's alpha; CR = composite reliability; AVE = average variance extracted.

EPPM Constructs

All EPPM constructs were measured with three items each, which were evaluated on a 5-point scale using anchors of 1 (*strongly disagree*) and 5 (*strongly agree*). Items representing the same construct were averaged to create a mean index score. The EPPM constructs of response efficacy, self-efficacy, severity, and susceptibility were assessed using an adapted version of the Risk Behavior Diagnosis Scale (Gould, Watt, Cadet-James, & Clough, 2015).

Response Efficacy

Participants rated three items regarding their perception of whether passengers can effectively protect themselves from pickpocketing on public transport (e.g., "Caution is an effective way to protect oneself from becoming a victim of pickpocketing on public transport").

Self-Efficacy

This was measured by asking respondents to rate three items regarding their perception of whether they are able to protect themselves from pickpocketing on public transport (e.g., "I can be attentive enough to avoid becoming a victim of pickpocketing on public transport").

Severity

Participants were asked to rate three items regarding their perceived severity concerning the idea of becoming a victim of pickpocketing on public transport (e.g., "I would be really upset if I became a victim of pickpocketing on public transport").

Susceptibility

Participants rated three items regarding their perception of whether it is possible that they could become a victim of pickpocketing on public transport (e.g., "There is a real risk that I can become a victim of pickpocketing on public transport").

Fear

Fear arousal was measured by asking participants to rate three items regarding their fear of becoming a victim of pickpocketing on public transport (e.g., "I am afraid of becoming a victim of pickpocketing on public transport"). These items were used similarly in previous studies (Siu, 2008).

Protection Motivation

Participants rated three items regarding their motivation to protect against pickpocketing on public transport in the future (e.g., "I will try to be more careful in the future so I won't become a victim of pickpocketing on public transport"). The items are based on the construct intention from the TPB (Ajzen, 2002a).

Reactance

This was measured by assessing message minimization (Witte, 1994). Respondents rated three items on a 5-point scale regarding whether they perceived the message as "overblown," "exaggerated," or "overstated."

To test the scales of the EPPM, we conducted a confirmatory factor analysis. The detailed results and descriptive statistics of all items are reported in Table A2 in Appendix. Table 1 shows the arithmetic mean, standard deviation, Cronbach's alpha, composite reliability, and average variance extracted of each scale in the study; correlations between constructs are displayed in Table 2.

Table 2. Correlations Between EPPM Constructs.

Scale	1	2	3	4	5	6
1. Self-efficacy	–					
2. Response efficacy	.66***	–				
3. Severity	.01	−.10***	–			
4. Susceptibility	−.19***	−.34***	.30***	–		
5. Fear	−.35***	−.42***	.27***	.56***	–	
6. Reactance	.00	.07**	−.21***	−.15***	.01	–
7. Protection motivation	.04	−.09**	.28***	.36***	.57***	−.19***

Note. N = 1,291 (only experimental groups, given that reactance was not measured for the control group). *** $p < .001$. ** $p < 0.01$. * $p < 0.05$.

Control Variables

In addition to testing the tenets of the EPPM, we controlled for the effects of individual and sociodemographic factors. These control variables account for the participants' prior experience and attitudes in the statistical model. The dichotomous variable victimization experience includes information about whether a participant has already been a victim of a theft on public transport (0 = no victimization experience; 1 = victimization experience). Of the 2,267 respondents, 283 (12.5%) had victimization experience with thefts on

public transport. Furthermore, we considered nonclinical anxiety to control whether this emotion has an influential role regarding protection motivation and reactance. We used the German scale for measuring nonclinical anxiety, developed by Mohr and Müller (2014), which consists of seven items. Internal consistency was good (a = .78), and the mean was below the midpoint of the scale (M = 2.52; SD = 0.82). In addition, we controlled for age and gender as sociodemographic factors of the respondents.

Randomization and Manipulation Checks

We conducted randomization checks with a one-factor analysis of variance (ANOVA) to determine whether age, $F(4, 1289) = 1.482$, $p = .224$, or gender, $F(4, 1289) = 0.037$, $p = .847$, was correlated with the experimental conditions. The results showed that randomization was successful. Following O'Keefe (2003), it can be argued that manipulation checks are not necessary when message manipulation outcomes are studied. Nevertheless, one can be curious whether the respondents consider the messages to be different regarding crucial criteria. To check whether the different levels of efficacy and threat can be attributed to the posters, we asked participants to rate their perception of whether the posters contributed to their perceived response efficacy, self-efficacy, severity, and susceptibility. Note that these were separate questions from the ones mentioned above and referred explicitly to the poster (e.g., susceptibility: "The poster reminded me that I could become a victim of pickpocketing on public transport"). The items were rated on a 5-point scale.

The manipulation check was calculated by a multivariate analysis of variance with the two experimental groups as the independent variable and the manipulation check variables as the dependent variables. We found a significant main effect between both groups, $F(4, 1286) = 56.877$, $p < .001$; Wilks's $\Lambda = .850$, partial $\eta 2 = .15$. Thus, we conducted follow-up univariate independent sample t tests for all four manipulation checks. Table 3 displays the mean values and standard deviations for both groups and the results of the t tests. It was found that the two posters led to different levels regarding the recipients' perceptions of the EPPM constructs. Furthermore, the differences were as assumed (i.e., higher perceived influence on self-efficacy and response efficacy for the coping message and higher perceived influence on severity and susceptibility for the loss appeal message). Hence, both posters can be assumed to be the causal reason for different outcomes on the dimensions tested in our model.

Table 3. Manipulation Checks: Independent Group t Test Between Experimental Groups.

	Loss frame		Gain frame			
Variable	*M*	*SD*	*M*	*SD*	*t* Test	*d*
Self-efficacy	2.48	1.29	3.06	1.29	−8.00***	.45
Response efficacy	2.38	1.26	2.93	1.28	−7.78***	.43
Severity	3.47	1.25	2.80	1.28	9.48***	.53
Susceptibility	4.21	0.99	3.86	1.13	5.98***	.33

Note. d = Cohen's d; *** $p < .001$.

Results

Effects of Coping and Loss Appeals on Protection Motivation and Reactance

To assess RQ1 and examine the differences between coping and loss appeals regarding the effect on protection motivation, we conducted an ANOVA by using all three groups as the independent variable: (a) fear appeal (n = 645), (b) coping appeal (n = 646), and (c) control group (n = 647). The results of the Levene tests showed that protection motivation met the assumption of equal variance. We found that protection motivation was significantly related to the experimental conditions, $F(2, 1935) = 15.50$, $p < .001$; Cohen's $d = .13$. Post hoc analyses using Bonferroni-adjusted alpha levels indicated that protection motivation was higher in the loss appeal group ($M_L = 3.80$, $SD_L = 0.94$) than in the coping appeal group ($M_C = 3.59$, $SD_C = 1.02$), $p < .001$; Cohen's $d = .21$, and in the control group ($M = 3.50$, $SD = 1.02$), $p < .001$; Cohen's $d = .31$. Based on these results, our first hypothesis (H1) that the coping appeal message produces greater protection motivation than the loss appeal message must be rejected. The pairwise comparison of the coping appeal group with the control group was not significant.

Because reactance was only measured for experimental groups, we conducted an independent sample t test with experimental conditions as the grouping variable and reactance as the outcome variable. The results show that those exposed to the loss appeal ($M_L = 2.07$, $SD_L = 1.02$) had higher levels of reactance than those exposed to the coping appeal message ($M_C = 1.90$, $SD_C = 0.87$), $t(1289) = 3.11$, $p < .01$, Cohen's $d = .18$, which supports our second hypothesis (H2).

Message Processing Patterns of Coping and Loss Appeals

To investigate differences in message processing patterns of coping and loss appeals in the context of the EPPM (RQ2), we conducted structural equation modeling (SEM) using the computing environment R and the package lavaan (Rosseel, 2012). Before the analyses, we checked the assumptions of SEM (i.e., linearity, multivariate normality, random residuals) and excluded multivariate outliers (n = 74) using Mahalanobis distances, which resulted in a final data set with 1,217 cases. A post hoc power analysis based on the chi-squared test and the degrees of freedom in the final model indicated that we had adequate power to detect the hypothesized effects (effect size = .10, alpha = .05, power = 1.00).

We considered response efficacy, self-efficacy, severity, susceptibility, fear, protection motivation, and reactance as latent variables, measured with three observed items each. The latent variables of efficacy and threat, according to the EPPM, comprise two subdimensions (response efficacy and self-efficacy as well as severity and susceptibility). The means of efficacy (M = 3.18, SD = 0.90) and threat (M = 4.06, SD = 0.71) were both above the midpoint of the scale. Based on H3f, we calculated a SEM with a path between fear and protection motivation. Subsequently, we compared this model with the original model (without the path between fear and protection motivation) and found that the new model fit the data significantly better ($\Delta\chi 2 = 66.438$, $p < .001$). Afterward, we also included the control variables of victimization experience, nonclinical anxiety, age, and gender in the model. All fit indices for the model (RMSEA = .046, CFI = .962, TLI = .956, SRMR = .071) were well within recommended values (R. B. Kline, 2015). We therefore continued our analysis with the theoretically assumed model.

To assess group differences in message processing, we tested measurement invariance across both experimental groups by conducting multigroup SEM. Therefore, the following sequence of four increasingly restrictive models were fitted and compared with the previous one: (a) configural invariance—same factor structure on all groups; (b) weak invariance—factor loadings are constrained to be equal across groups; (c) strong invariance—factor loadings and intercepts are constrained to be equal across groups; and (d) means—factor loadings, intercepts, and means are constrained to be equal across groups. To evaluate measurement invariance, we conducted chi-square tests and examined model fit indices (P. Kline, 2015). The results are reported in Table 4. Chi-square tests and the comparison fit indices showed that the hypothesized model met the criteria for configural, weak, and strong invariance. Only the means of the latent factors varied between the two experimental groups. This means that the messages did have an effect on efficacy, threat, fear, protection motivation, and reactance (i.e., confirming the manipulation check), but did not result in structural differences of the model that would indicate distinct patterns of message processing. The pattern of how the variables are related with each other is equal for both groups.

Table 4. Results of Measurement Invariance Tests for Both Experimental Groups.

Model	$\chi 2$	*df*	*p*	CFI	RMSEA
M1: Configural invariance	1185.6	471	.59	.96	.050
M2: Weak invariance	1199.8	487	.59	.96	.049
M3: Strong invariance	1218.3	499	.10	.96	.049
M4: Means	1239.5	508	.01*	.95	.049

The Role of Fear in Message Processing of Coping and Loss Appeals

Because we found no empirical evidence for different message-processing patterns of coping and loss appeals, we continued with the SEM across both experimental groups to investigate the role of fear in the processing of preventive messages (RQ3). The results are presented in Table 5 and visually displayed in Figure 2.

Table 5. Detailed Results of the Regressions in the Structural Equation Model.

Path	B	*SE*	*p*	LCI	UCI	β
Efficacy → Protection motivation (H3a)	.36	.04	< .001	.28	.44	.30
Efficacy → Fear (H3b)	−.18	.06	< .01	−.28	−.07	−.12
Threat → Protection motivation (H3c)	.94	.11	< .001	.84	1.01	.41
Threat → Fear (H3d)	1.66	.13	< .001	1.40	1.91	.65
Fear → Reactance (H3e)	−.08	.02	< .01	−.13	−.04	−.11
Fear → Protection motivation (H3f)	.34	.04	< .001	.26	.41	.42
Anxiety → Protection Motivation	−.07	.03	< .05	−.12	−.01	−.06
Anxiety → Reactance	.19	.04	< .001	.12	.26	.19
Age → Threat	−.00	.00	< .01	−.00	−.00	−.10
Age → Reactance	−.01	.00	< .001	−.01	−.01	−.17
Age → Protection motivation	.01	.00	< .001	.01	.01	.15
Gender → Efficacy	−.12	.05	< .05	−.21	−.03	−.08
Gender → Threat	.14	.03	< .001	.08	.19	.16

Note. B = unstandardized coefficient; LCI = lower 95% confidence interval; UCI = upper 95% confidence interval; β = standardized coefficient.

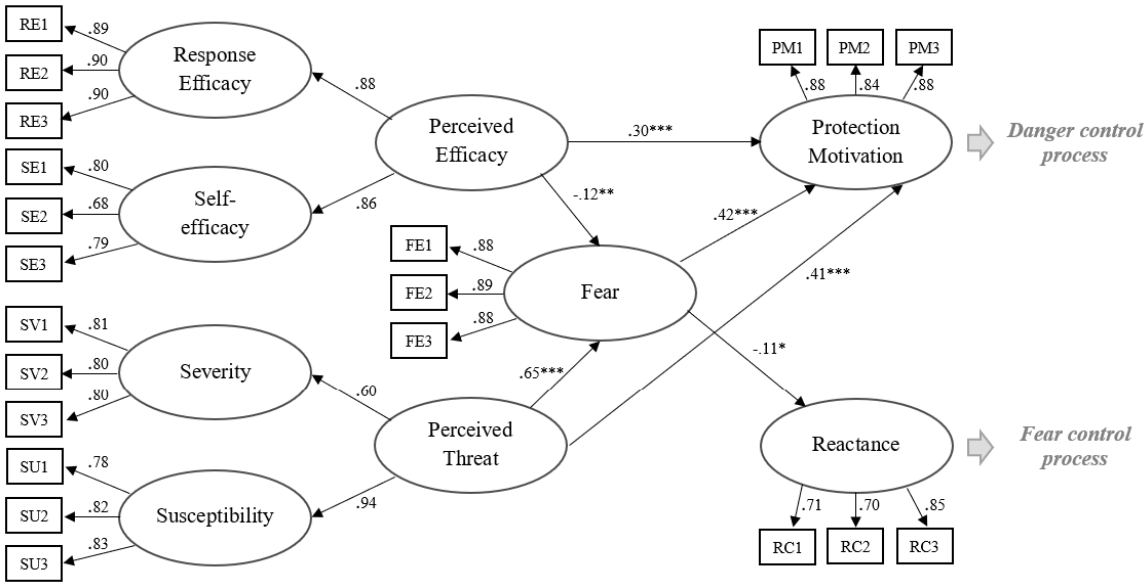

Figure 2. Structural equation model testing the extended parallel process model (EPPM). Standardized coefficients.

The results showed that perceived efficacy was a significant contributor of protection motivation (β = .30, p < .001). At the same time, efficacy reduced fear (β = −.12, p < .01), which resulted in a negative indirect effect (β = −.05, p < .01) and a total effect of β = .13 (p < .001). These results supported H3a and H3b. Perceived threat was also associated with protection motivation (β = .41, p < .001) and fear (β = .65, p < .001), which is in line with H3c and H3d. The indirect effect of threat on protection motivation via fear

was also significant (β = .27, p < .001), which resulted in a total effect of threat on protection motivation of β = .68 (p < .001). The results also indicated that fear is negatively related to reactance to the message (β = −.11, p < .01), which contradicts H3e. Regarding H3f, we found fear to be a predictor of protection motivation (β = .42, p < .001), supporting our hypothesis.

We also controlled for the effects of victimization experience and nonclinical anxiety on the dependent variables. Victimization experience with thefts on public transport was significantly related to neither protection motivation nor reactance. The results also showed that nonclinical anxiety was negatively associated with protection motivation (β = −.06, p < .05) and positively related to reactance (β = .19, p < .001). Furthermore, we controlled for the effects of sociodemographic factors. The results revealed that age was associated with threat (β = −.10, p < .01), reactance (β = −.22, p < .001), and protection motivation (β = .16, p < .001), but was not related to efficacy and fear. Gender was a significant contributor to efficacy (β = −.08, p < .05) and threat (β = .16, p < .001), indicating that women had lower levels of efficacy and higher levels of threat. Gender was not associated with fear, reactance, or protection motivation. The final model accounted for 48.3% of the variance in protection motivation, 10.4% in reactance, and 50.0% in fear.

Discussion

Comparing coping and loss appeals, we found substantial differences regarding the effect on protection motivation and reactance (RQ1). In our experiment, the loss appeal led to a higher level of protection motivation than the coping appeal. This finding is contrary to our assumptions (H1) and earlier research, which suggested that fear appeals without coping components lead to the fear control process and evoke reactance (Witte, 1994). In fact, we found empirical support for this related assumption. Those exposed to the loss appeal had higher levels of reactance than those exposed to the coping appeal (H2). An explanation for why fear appeals result in higher protection motivation despite higher reactance could be the generally low level of reactance regarding both messages. The mean scores of reactance for both experimental conditions were well below the midpoint of the scale. This indicates that the participants did find both the coping and loss appeal appropriate and not exaggerated. This general acceptance of the messages may explain why the loss appeal worked better in increasing protection motivation, although reactance to the message was higher compared with the coping appeal. By including a control group, which is surprisingly rare for this domain, we found no difference between the coping appeal and the control group regarding protection motivation, suggesting that a communication campaign based on our coping appeal would be ineffective in increasing protection motivation against pickpocketing. Thus, based on these findings, it seems advisable to prefer loss over coping appeals to increase protection motivation on this topic.

Leventhal (1970) and Witte (1994) proposed a specific sequential order of message processing. Despite the wide application of the EPPM, this sequential order was barely addressed in empirical studies, and our study design is not suitable for investigating this issue in detail (Meczkowski, Dillard, & Shen, 2016). However, we can contribute to this understudied aspect through our multigroup comparison of the SEM regarding coping and loss appeals (RQ2). Whereas the loss appeal induced more fear and thereby led to a higher level of protection motivation, there was no evidence for fundamental differences in message processing. However, this would be expected if the assumption is correct that threat appraisals come first and determine whether efficacy appraisals are carried out at all or if the threat solely leads to reactance

(i.e., cannot have a positive effect on protection motivation). The sequential order of threat and efficacy appraisal is also questioned by the more general cognitive psychology finding that cognitive and affective processes are more interconnected than assumed in EPPM theory (Huntsinger & Schnall, 2013). Alternatively, it can be argued that we have not stressed tolerance with respect to threatening messages in our experiment. Hence, it cannot be ruled out that more extreme levels of threat would result in a distinct pattern.

Investigating the role of fear (RQ3) in message processing, we found empirical evidence supporting most hypotheses derived from the EPPM. Only the effect of fear on reactance (H3e) is not supported. Furthermore, the extension of the EPPM, as suggested by H3f, is supported by a direct effect from fear on protection motivation. According to these findings, we should consider at least two routes when studying the effect of fear appeals. First, threat may have a direct effect on protection motivation. Second, threat may trigger fear, which in turn influences protection motivation. In our study, the total effect of threat on the danger control process (i.e., increasing protection motivation) is distinctly higher than the effect of perceived efficacy or the negative effect on the fear control process (i.e., reactance). This finding might be related to the perception of the risk characteristics (Jungermann & Slovic, 1993) of pickpocketing. Pickpocketing on public transport is a risk with relatively minor consequences in comparison with severe health issues (e.g., cancer, AIDS) and accidents, for which the EPPM is often applied. Because the loss appeal inherently led to higher levels of fear, we assume that security messages addressing manageable monetary losses tolerate and require more fear arousal than life-threatening risks to increase protection motivation.

Implications

Having stressed the power of loss appeals and thereby induced fear, we need to emphasize that our findings should neither be misunderstood as a general recommendation for the use of loss appeals addressing pickpocketing nor transferred to other topics of prevention campaigns. Four central aspects must be considered to put our findings in context to inform future research and campaign practices.

First, we found perceived efficacy to be a highly significant predictor of protection motivation. Thus, passengers who perceive that they can perform the desired behavior are more likely to protect themselves against pickpocketing. This supports the argument of the EPPM that efficacy should be considered a relevant precondition of how different messages are processed. However, our finding suggests that efficacy-enhancing messages do not need to be part of a campaign if perceived efficacy is already high enough within the target group.

Second, as suggested by the EPPM, there might be a tipping point at which the model changes, and fear control processes become the dominant reaction. However, this threshold is likely to be dependent on the topic and preexisting attitudes. In this context, pickpockets appear to be a risk with relatively minor consequences in comparison with other crimes related to public transport (e.g., assaults, sexual harassment, homicide). We assume that campaign messages dealing with minor risks (e.g., the manageable loss of money or valuables) require more fear arousal than messages that aim toward the prevention of crimes with severe physical or psychological consequences. In the latter case, overly increased fear arousal could lead to fear control processes and evoke reactance. Thus, the identification of an appropriate level of threat-

and efficacy-enhancing messages requires case-by-case decisions based on the characteristics of the addressed risk and the preexisting attitudes (for the measurement of risk characteristics, see Jungermann & Slovic, 1993).

Third, alongside maximizing a functional campaign effect (e.g., protection motivation), a campaign designer might want to consider additional effects and will try to avoid dysfunctional campaign effects. A dysfunctional campaign effect would be given when passengers perceive public transport as nonsecure and avoid using it. Hence, public transport operators should try to increase protection motivation by inducing as little fear as possible. Inappropriate messages and the resulting levels of psychological reactance not only may lead to a failure of persuasive messages (Leshner, Bolls, & Wise, 2011), but also may reduce customer satisfaction and contradict the general aim of being perceived as a provider of a secure mode of transportation (Fitzsimons & Lehmann, 2004). In the case of pickpocketing, the decision regarding a functional threat level could be informed by objective crime statistics and customer satisfaction surveys. Furthermore, campaigns may be limited to specific stations, lines, times of day, days of the week, or seasons to minimize dysfunctional side effects.

Fourth, in addition to the topic and the specific message, campaign managers should take the characteristics of the target group into account (e.g., age, gender, traits, general trust). Whereas previous studies rarely considered the effects of sociodemographic factors in the context of the EPPM, we found that age and gender had effects on various EPPM constructs. Most important, older recipients showed less reactance to the message and had higher levels of protection motivation than younger people, and women perceived lower levels of efficacy and higher degrees of threat regarding pickpocketing on public transport. These results indicate that the messages worked better for an older target group and underline the relevance of gender differences regarding risk and security perception. This is in line with other studies that showed that older people and women feel less secure on public transport than younger passengers and men (Delbosc & Currie, 2012; Hamilton & Jenkins, 2000). Communicators should consider these insights by choosing appropriate communication channels and messages to reach their target groups.

Limitations

We measured participants' protection motivation immediately after a single exposure to the messages. Therefore, we did not examine cumulative and long-term effects and were not able to make any predictions about the actual behavior. Even though protection motivation is a strong predictor of actual behavior, a significant amount of unexplained variance still exists (Sheeran, 2002). In line with more recent versions of the TPB (Ajzen, 2002b), it would therefore be of interest to investigate perceived efficacy and threat not only as independent variables explaining protection motivation, but also as moderating factors of the intention–behavior gap. Hence, beyond including actual behavior as the dependent variable, whether and how fear arousal influences the relationship between protection motivation and protection behavior would be of broader scientific interest (Gallagher & Updegraff, 2012; Jensen et al., 2018).

Because several elements were manipulated at the same time (catchphrase, pictogram, and color), we were not able to tell which elements were responsible for the effects found. Future studies and pretests for a real campaign could consider the variation of single aspects to test and improve campaign design.

We only controlled for age, gender, victimization experience, and nonclinical anxiety as individual factors that may affect the processing of security messages. It can be assumed that other individual characteristics and emotions influence the effects of persuasive messages on fear and protection motivation. Hence, additional individual characteristics and emotions should be examined in further studies.

Finally, the survey was conducted in a central European country with high standards of security. In particular, the relationship between fear and protection motivation and the resulting practical suggestions cannot be generalized to other countries and cultures, and need to be verified in other contexts.

Conclusion

We can conclude that the EPPM is a sound framework that provides valuable insights into protection behavior regarding pickpockets on public transport. In addition to the application of the theory to a novel topic, the findings also suggest a slight adaptation of the original model. In contrast to and extension of the original EPPM, the role of fear as an effective response to a message seems not to be limited to stimulating cognitive processes (i.e., efficacy assessment). In addition to the strong and direct effect of fear on protection motivation, the power of fear is also supported by the finding that the same model is supported by the two opposing campaign strategies of increasing perceived efficacy or threat (i.e., coping vs. loss appeals).

With respect to practical implications, including a control group in message tests has proved to be advisable. Otherwise, it may remain unnoticed that avoiding reactance may result in ineffective messages. Based on our findings, prevention campaigns by public transport providers should consider fear appeals as a potentially effective message strategy to improve protection motivation. In sum, this study shows that communication campaigns regarding pickpocketing on public transport can have an impact if the message design follows the theoretical and empirical evidence provided by EPPM; message pretesting (including a control group) is crucial to account for preexisting attitudes and differences between target groups. Given that other interventions, such as more security personnel, are likely to be more expensive, communication efforts are an efficient strategy to reduce pickpocketing on public transport (Reichow & Friemel, 2020).

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Appendix

Table A1. Demographic Composition.

	Quota	Sample	
	%	*N*	%
Gender			
Male	48.0	1079	47.6
Female	52.0	1188	52.4
Age			
16–19	4.0	92	4.1
20–29	14.0	290	12.8
30–49	34.0	782	34.5
50–64	24.0	551	24.3
65+	24.0	552	24.3
Total		2,267	

Note. Quota sampling is based on the 2011 EU census in Germany.

Table A2. EPPM Measurement and Results of Confirmatory Factor Analysis.

Scale	*M*	*SD*	Std. Load.	α	CR	AVE
Self-efficacy	3.38	0.91		.81	.82	.60
SE1	3.21	1.12	.81			
SE2	3.57	1.03	.70			
SE3	3.36	1.07	.80			
Response efficacy	2.98	1.10		.93	.93	.81
RE1	2.97	1.19	.89			
RE2	2.99	1.19	.91			
RE3	2.96	1.16	.90			
Severity	4.35	0.76		.86	.86	.67
SE1	4.29	0.90	.81			
SE2	4.29	0.89	.81			
SE3	4.47	0.79	.84			
Susceptibility	3.77	0.91		.86	.86	.68
SU1	3.76	1.03	.78			
SU2	3.80	1.02	.84			
SU3	3.73	1.05	.85			
Fear	3.01	1.16		.92	.92	.80
FE1	3.03	1.27	.89			
FE2	2.93	1.22	.90			
FE3	3.05	1.25	.89			
Reactance	1.99	0.95		.81	.81	.59
RC1	2.08	1.18	.72			
RC2	1.97	1.10	.73			
RC3	1.91	1.08	.86			
Protection motivation	3.70	0.98		.92	.92	.79
PM1	3.67	1.06	.89			
PM2	3.69	1.08	.87			
PM3	3.73	1.04	.90			

Note. *N* = 1,291 (only experimental groups, given that reactance was not measured for the control group); α = Cronbach's alpha; CR = composite reliability; AVE = average variance extracted.; bold text = scale.

Figure A1. Experimental stimuli. Positive message: Headline—"Thieves won't stand a chance if your bag is closed." Small text next to QR code—"10 tips for your safety on public transport" (left). Fear appeal: Headline—"500 euro gone in just 5 seconds, 500 times a day." Small text next to QR code—"10 facts on criminality on public transport" (right).