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**Using Protection Motivation Theory to
Increase the Persuasiveness of Public Service Communications**

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Magdalena Cismaru,
Faculty of Business Administration, University of Regina

Introduction

People are exposed to public service announcements that advocate for changes in behaviour, such as abstaining from drinking and driving, wearing a seatbelt, quitting smoking, preventing obesity, or protecting against west Nile virus. Consider the following TV commercials. Each commercial attempts to persuade young people to abstain from drinking and driving. The ads described were found when visiting <http://www.visit4info.com/>, a database containing TV ads from all around the world.

1. A young man arrives at the emergency room in bad shape; he is displaying visible injuries and lots of blood. A doctor provides some statistics about how many people arrive daily at the emergency room because they drove under the influence and how many of them die or remain physically impaired. The ad emphasizes the high probability of causing an accident while driving under the influence and the severe consequences for the driver.

2. A man crashes his car while driving “after only a few drinks” and his girlfriend is killed. The ad emphasizes that the gentleman felt he was still capable of driving but was unable to do so safely and the lifelong consequences that he will face, including feeling guilty about his girlfriend and missing her.

3. A middle-aged couple comes home to find their house full of young people who have passed out after a night of drinking. However, all the cars’ keys are locked safely, thus nobody drove under the influence. The couple feels very relaxed when they realize this. The ad provides the recommendation to sleep over after drinking because time is needed to sober up.

4. In yet another ad, a young boy wakes up after some heavy drinking and there is a sheep in bed with him. This particular ad focuses on the foolish things people do when they drink too

much. However, the consequences displayed in this ad are far less severe than becoming infirm, dying or killing a significant other.

Of the presented advertisements, which will be the most effective in changing young people's behaviour in respect to drinking and driving? How can public service communicators decide how to better persuade people to change behaviour that is harmful to them and society as a whole? As more and more money is spent on public service campaigns, it becomes increasingly important to understand the factors that make campaigns more persuasive and effective. In this paper we review the existing literature on this topic and provide recommendations for practitioners about the persuasiveness of public service announcements.

Theoretical Background

Several theories that attempt to explain how people respond to public policy announcements have been advanced. The Social Cognitive Theory (Bandura 1977, 1986), the Health Belief Model (Becker 1974; Janz and Becker 1984; Rosenstock 1966), the Theory of Reasoned Action (Fishbein and Ajzen 1975), the Theory of Planned Behaviour (Ajzen 1988), and the Protection Motivation Theory (PMT) (Rogers 1975, 1983, 1985) are the most representative. At present, PMT, which combines some of the features of the Health Belief Model, the Theory of Reasoned Action and the Self-efficacy Theory, is the most influential theory of health behaviour.

According to PMT (see Figure 1), four factors influence attitudinal and behavioural responsiveness to public service announcements: 1) perceived vulnerability to the undesirable outcome; 2) perceived severity of the undesirable event; 3) efficacy of the recommendations in terms of avoiding the undesirable event, promoting a desirable outcome, or being able to follow the recommendations; and 4) cost of adhering to the recommendations.

Figure 1 - Cognitive Mediating Processes

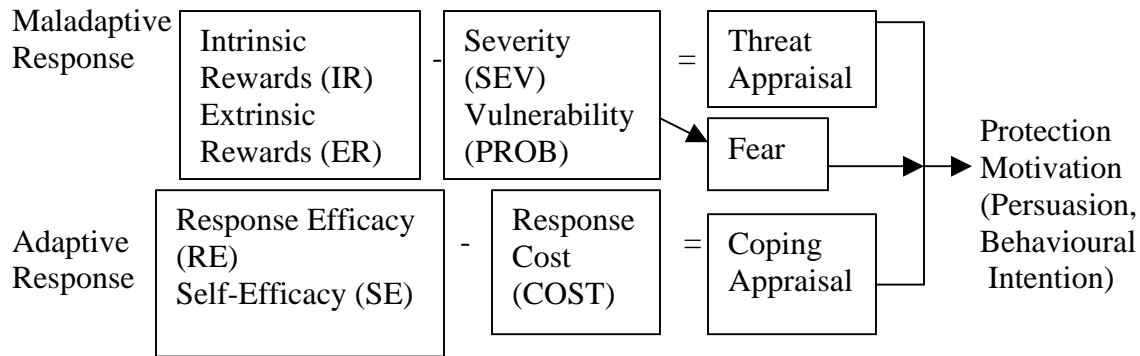


Figure 1: Cognitive mediating processes of protection motivation theory (from Rogers and Prentice-Dunn, 1997)

Perceived vulnerability to the undesirable outcome refers to one’s subjective perception of the risk of a negative event happening to them. Such an event could include causing an accident while driving under the influence or developing a disease such as lung cancer because of smoking. Individuals vary widely in their feelings of personal vulnerability. However, it is expected that the higher the perceived vulnerability to a negative event, the higher the intention to follow the recommendations. In the above examples, a high level of vulnerability is likely to be perceived when the doctor provides statistics regarding the number of people causing car accidents while driving under the influence.

Perceived severity to a negative event refers to feelings concerning the seriousness of causing an accident while driving under the influence, or contracting an illness like lung cancer (or leaving it untreated). This dimension includes the evaluation of both medical consequences (e.g., death, disability, and pain) and possible social consequences (e.g., effects of the conditions on work, family life, and social relations). Perceived severity also varies from person to person. It is expected that the higher the perceived severity to a health condition, or other negative outcome, the higher the intention to follow the recommendations. In the presented ads, a high level of severity is perceived when the person who drove under the influence ended up at the emergency room or

caused an accident that killed his girlfriend. In contrast, waking up with a sheep in bed can be considered a low severity scenario.

Perceived response efficacy refers to the person's belief that the recommended behaviours will be effective in reducing or eliminating the danger. In this case, a recommendation to abstain from drinking and driving would significantly reduce one's chances to cause an accident. It is expected that the more efficacious the health recommendation, the more positive is the response. Here we use the phrase 'positive response' to refer to a broad range of variables including attitude, intention, and actual adoption of the recommended health behaviour (the persuasiveness of a health recommendation). A lesser level of response efficacy might be experienced when one is following a diet with the purpose of losing weight but is not sure about the outcome.

Perceived self-efficacy refers to the person's belief that he or she has the ability to perform the recommended behaviours (he or she can overcome the costs). It is expected that the higher the perceived self-efficacy, the more positive the response. In other words, if the person actually feels that s/he can abstain from drinking and driving, the person is more likely to actually do it. Some people might consider it easier to sleep over than to completely abstain from drinking.

In public policy announcements, information about vulnerability and severity is often combined. Researchers refer to this combined information as being the "**threat**" information (Sturges and Rogers 1996). In the same way, often information about response and self-efficacy is provided together. Researchers refer to this combined information as being the "**coping**" information (Sturges and Rogers 1996) (see Figure 1).

Finally, **perceived cost** represents the sum of all barriers to engaging in the recommended behaviour. This includes monetary costs and non-monetary costs such as time, effort, inconvenience, discomfort, etc. It is expected that the higher the cost of engaging in the

recommended behaviour, the lower the intention to adhere to the recommendations. One perceived cost would be that a person who does not drink at a party does not have the same fun. In the same way, a young boy/girl who sleeps over to sober up might face criticisms from parents.

When Rogers revised PMT in 1983, he specified rewards of not adopting the recommended behaviour as part of the coping-appraisal process. The higher the reward of not adopting the coping response, the less likely the individual is to adopt it.

Threat Appraisal vs. Coping Appraisal

According to Tanner, Hunt, and Eppright (1991), individuals appraise their environment for relevant/salient information and their ability to cope with the assessed situation. Fear leads to the processing of a coping response and self-efficacy information or the ability to overcome perceived barriers of adoption or costs. The motivation to act arises from the expectation that the action can reduce the likelihood or severity of harm (Weinstein 1993). Protection motivation reflects the answer to the question: “Am I intending to perform the recommended behaviour?” (Boer and Seydel 1996), whereas protective behaviour is measured by seeing if a person is, or is not, performing the recommended behaviour (Boer and Seydel 1996). We consider these measures as representing persuasion, or the effectiveness of a public service announcement.

To conclude, according to PMT, persuasion and public service campaign effectiveness is maximized when:

- the individual feels vulnerable;
- the threat is severe;
- the adaptive response is believed to be an effective means of averting the threat;
- the person is confident in his or her abilities to complete successfully the adaptive response;

- the rewards associated with the maladaptive behaviour are small; and,
- the costs associated with the adaptive response are small.

Such factors produce protection motivation, and subsequently, the enactment of the adaptive, or coping response (Maddux and Rogers 1983; Prentice-Dunn and Rogers 1986; Rogers 1975, 1983).

Main Effects

Although initially PMT variables were assumed to be equally important predictors of behavioural intention and other persuasion measures, recent studies show that the coping variables are more important than the threat variables. Specifically, Milne, Sheeran, and Orbell (2000) conducted a meta-analytic review of PMT studies with the purpose of evaluating the success of PMT in the prediction of health-related intentions and behaviours. Published studies were identified using three databases available online (PsychLit, Medline, and Social Sciences Citation Index) and using the keyword “protection motivation”. An additional search was carried out to identify all papers citing Rogers (1975, 1983). Review papers, book chapters, and unpublished research were also included. The following criteria were used to select studies suitable for inclusion in the analysis:

- the study had to be an empirical application of PMT;
- there had to be measures of behavioural intention and concurrent and subsequent behaviour included in the analysis (concurrent behaviour refers to measures of behaviour taken at the same time as measuring PMT variables, whereas subsequent behaviour refers to measures of behaviour taken after a period of time later than measuring PMT variables); and,

- the behaviour used in the study had to be a health-related behaviour (e.g., breast self-examination, smoking cessation, adopting a health diet).

Twenty-seven studies, with 29 independent samples and 7,694 participants, fulfilled the criteria for the inclusion. Most of the studies (14) used samples of high school, college, or university students. General population samples were used in 7 studies, while 7 targeted specific groups such as dental patients, homosexual men, or low- and high-risk drinkers. Two methods of data analysis were used: (1) meta-analysis to examine the overall strength of associations between threat- and coping- appraisal variables and intention and (2), all PMT variables and behaviour and vote counts used to examine how often these associations were significant across the individual studies. Persuasion measures included intention, concurrent behaviour, and subsequent behaviour. The results for the individual associations between PMT variables and persuasion measures are displayed in Table 1.

Table 1: Individual associations of PMT variables with persuasion measures (Milne, Sheeran, and Orbell, 2000)

Variable	Intention	Concurrent behaviour	Subsequent behaviour
Vulnerability	.16	.13	.12
Severity	.10	.10	not significant
Response efficacy	.29	.17	not significant
Self-efficacy	.33	.36	.22
Costs	-.34	-.32	-.25

The findings of the meta-analysis offer modest support for the threat- and coping-appraisal components of the PMT model in predicting health-related intentions. All variables were significantly associated with intention. However, the associations between coping variables

(efficacy and costs) and persuasion measures were stronger than the associations between threat variables (vulnerability and severity) and persuasion measures.

In short, according to the meta-analysis (Milne, Sheeran, and Orbell, 2000), all PMT variables are important predictors of behavioural intention. However, cost has the most impact on persuasion measures and on the effectiveness of a public service campaign. Self-efficacy and response efficacy also have an important impact, whereas the effect of vulnerability and severity is modest.

Based on this meta-analytic review, we recommend that public service communicators focus on coping variables and attempt to develop acceptable standards for costs, thus finding ways to provide easy-to-follow recommendations, as intention to follow the recommendations drops dramatically when the costs of adopting the recommendations are perceived as being too high. Communicators should also find ways to boost people's confidence in their ability to follow the recommendations and emphasize the effectiveness of the recommendations (high response efficacy). Although there should be a minimal level of threat experiences in order to trigger motivation to act, the Milne, Sheeran, and Orbell (2000) review shows little impact of vulnerability and severity on the persuasiveness of an appeal. Consequently, this review seems to suggest that a high level of threat (high vulnerability and high severity) might not have a significant impact on the intention to adopt the recommendations. Thus, public service announcements attempting to change people's behaviour by showing them very severe consequences might not be very effective. Although this result is counterintuitive, experience would support this as many people continue to drive under the influence after they were exposed to numerous public service announcements depicting situations in which the driver or another person lost his life (high severity).

Interaction Effects among PMT Variables

The purpose of the next stage of our review is to assess if there are interaction effects among the variables (the effect of a variable depends on the level of another in particular cases, or at least its effect on persuasion measures is contingent on the perceived level of another variable). Marketing researchers attempt to increase the persuasiveness of health communications by focusing on one of the four variables (vulnerability, severity, efficacy, and cost) posited by PMT to influence attitudinal and behavioural responses and to change the viewers' perception, thereby increasing persuasion. For example, if people ignore messages advocating changes in behaviour because they do not feel vulnerable, researchers will look for ways to increase perceived vulnerability. However, perceived vulnerability is influenced by other variables' effects on persuasion or by the perception of another variable. For example, Weinstein (1993) reported an interaction effect between probability and severity, showing that when the perceived severity is low, people are insensitive to the actual likelihood. Thus, higher vulnerability does not always lead to higher persuasion. Consequently, it seems opportune to review the studies reporting interactions among variables. Literature provides evidence for several two-way and three-ways interactions as well as contradictory information about possible combinatorial rules.

Significant interaction effects among variables are not always present for many reasons (see Weinstein 1983 for details). In the present review, we focus on those studies that did find significant interaction effects. The literature shows significant interaction effects between vulnerability and severity, response-efficacy and self-efficacy, vulnerability and response efficacy, vulnerability and self-efficacy, severity and response efficacy, and response efficacy and costs. Three-way significant interactions between vulnerability, severity, and response efficacy; vulnerability, severity, and self-efficacy; and vulnerability, response efficacy, and self-efficacy

were also reported. Studies have also found that, in general, the threat and coping variables interact.

Two-way Interaction Effects:

Literature shows that vulnerability interacts with the other PMT components as follows:

Vulnerability – Severity

Three recent studies reported significant interaction effects between vulnerability and severity. Weinstein (2000) empirically investigated the combined effect of vulnerability and severity on the motivation to act. Using a convenience sample and a list of 201 events that occupied the full range of likelihood and severity, Weinstein (2000) reported a significant interaction effect between probability and severity on the motivation to act. This implies that people are insensitive to variations in hazard probability when probabilities are in the moderate to high range. He also observed that the motivation to take precautions was very low when either vulnerability or severity was zero. At high vulnerability and low severity, people were responsive to the degree of seriousness but surprisingly insensitive to the actual likelihood.

Das, de Wit, and Stroebe (2003), reported results from three studies conducted in the context of stress-related health problems. Their results confirmed that vulnerability was a major determinant of attitudes toward the action recommendation. Increases in vulnerability invariably led to more positive attitudes in each study. The effects of severity were less consistent across studies; however, the findings seem to suggest that if severity had an effect on attitudes, it was observed mainly under conditions of low vulnerability.

Finally, Pechmann, Zhao, Goldberg, and Reibling (2003) used PMT to formulate hypotheses regarding the likely impact of seven common themes in antismoking messages on the

cognitions that they attempt to influence, including health and social risk severity and self-efficacy at refusing cigarette offers and resisting tobacco marketing. The authors documented an interaction that has rarely been observed when they assessed the likelihood that if a theme affects cognition, it will also affect intention. Given low perceived vulnerability, higher perceived health risk severity was associated with increased intentions to engage in a risky behaviour. Given moderate vulnerability, severity and intentions were not associated.

Vulnerability – Response Efficacy

Rogers and Mewborn (1976), and Kleinot and Rogers (1982) reported an interaction between the probability of occurrence and response efficacy. According to Rogers (1983), “if the recommended coping response is a highly effective preventive practice, increasing the probability of exposure to the danger increases intentions to adopt that practice. If the response is ineffective, increased probability decreases intentions to adopt the response”. Indeed, smokers intend to increase their cigarette consumption when they feel their efforts do not lead to results (Rogers and Mewborn 1976), and social drinkers intend to increase their alcohol consumption in the same situation (Kleinot and Rogers 1982).

Vulnerability – Self-Efficacy

Yzer, Fisher, Misovich, Bakker, and Siero (1998), manipulated perceived vulnerability and perceived self-efficacy with regards to AIDS preventive behaviour and reported a significant interaction effect on behavioural intention. A high perceived vulnerability to HIV had a positive impact on the intention to engage in protective measures but only when a high sense of self-efficacy was also experienced. On the other hand, Rimal and Real (2003) suggested that, when vulnerability and self-efficacy was high, people's vulnerability guided most of their subsequent actions. However, in a natural context (in another study conducted by the same authors in which

none of the variables were manipulated), risk and efficacy jointly affected subsequent action. Thus, the results were not consistent in this case.

Severity was also found to interact with the other variables as follows:

Severity – Response Efficacy

Courneya and Hellsten (2001) independently manipulated perceived vulnerability, perceived severity, response efficacy, and self-efficacy. The results indicated a significant main effect for perceived severity and a significant interaction between perceived severity and response efficacy. The interaction was such that individuals who were led to believe that colon cancer was a severe disease (high perceived severity), were more motivated to exercise if they also believed the exercise was effective (high response efficacy), as opposed to ineffective (low response efficacy), in reducing their risk of colon cancer. Conversely, individuals who were led to believe that colon cancer was not a very severe disease (low perceived severity), were not differentially motivated to exercise based on their response efficacy belief.

Kyes (1995) examined the effect of severity and response efficacy messages on safe sex attitudes and intentions of college students. Although the manipulations of severity and response efficacy had no apparent effect on attitudes toward STDs or condoms, they did produce an interactive effect on intentions to engage in safer sex. The high severity/high response-efficacy group held the greatest intentions to engage in adaptive behaviours; however, the low severity low response-efficacy group was virtually equal in intentions.

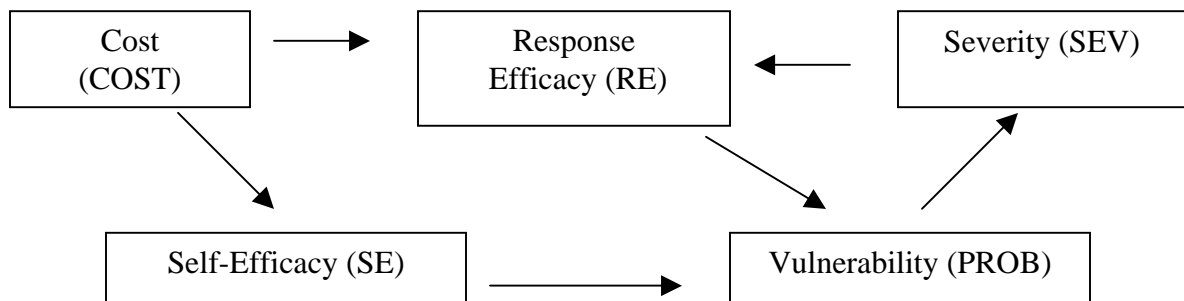
Response Efficacy – Response Costs

Krishnamurthy, Cismaru, and Nagpal (2004) investigated the combined effect of the perceived response efficacy of the recommendations and the response cost involved by the

adherence to the recommended preventative behaviour. They conducted three studies in the context of preventing and detecting skin cancer and preventing Chronic Fatigue Syndrome and reported an interaction effect between response efficacy and costs, suggesting that the perceived level of response efficacy of the recommendations depends on the perceived costs that will result from adoption. Specifically, when the cost is high, the perception of response efficacy is diluted, and the persuasiveness of a health appeal is the same, regardless of the level of response efficacy.

In addition, self-efficacy is often defined as “the ability to overcome the costs”, which implies that self-efficacy perception and/or effect on persuasion depend on the perceived level of cost. Consequently, based on the empirical evidence described, we can conclude that the perception of PMT variables and their effect on persuasion measures is not independent; rather, numerous interaction effects make the combined effect of PMT variables on persuasion more complex. A summary of the two-way interaction effects reported in the literature is presented in Figure 2.

Figure 2: Summary of Two-way Interaction Effects



Higher Order Interaction Effects:

At least four different studies investigating the combined effect of several PMT variables on persuasion measures reported three-way interaction effects (Block and Keller, 1998; Madux and Rogers, 1983; Neuwirth, Dunwoody, and Griffin, 2000; Wurtele and Maddux, 1987). Although higher order interaction effects are difficult to interpret, three out of four cases noted, higher

persuasion levels were observed under high levels of PMT variables. This will be an important finding while reviewing combinatorial rules among PMT variables.

Threat Variables and Coping Variables:

Studies have found that, in general, threat and coping variables interact. If response efficacy or self-efficacy is high, higher levels of threat severity and one's vulnerability to it results in stronger intentions to adopt the recommended response. If response efficacy or self-efficacy is low, increases in severity and vulnerability weakened intentions (the "boomerang" effect) (Sturges and Rogers 1996). This same result has been noted when public service announcements are intended to moderate drinking (Kleinot and Rogers 1982, Self and Rogers 1990), to stop smoking cigarettes (Rogers and Mewborn 1976), to protect oneself against sexually transmitted diseases (Rogers and Mewborn 1976), and to increase self-reported condom use (Witte 1992a,b,c).

In short, although the individual impact of PMT variables on persuasion has been assessed, higher levels of threat and efficacy and lower levels of costs have not always led to higher persuasion. Rather, numerous significant interaction effects have been reported, alerting public service communicators to the need to be cautious when attempting to increase persuasion by increasing the perceived level of threat and efficacy and decreasing the perceived level of costs.

Combinatorial Decision Rules

Additive versus Multiplicative

Considering either a multiplicative model or an additive model, researchers disagree on the combined effect of PMT variables on persuasion. A multiplicative model assumes that no protection motivation would be aroused if the value of any of the component is zero, and expects a significant interaction effect among all variables (Block and Keller 1998; Rogers 1985). In contrast, an additive relationship assumes that even when one of the predictor variables is zero, the

persuasion could be different than zero (high levels of some variables could compensate for low levels of other variables). Combinations of high levels of the variables produce the highest persuasion scores, while combinations of the lowest levels produce the lowest persuasion scores (Maddux and Rogers 1983).

Proposed Combinatorial Rules and Empirical Evidence

Rogers (1975) originally proposed that perceived vulnerability, severity, and response efficacy should combine multiplicatively to influence intentions (self-efficacy was not a component of the original model) (Eagly and Chaiken 1993). This multiplicative relation was proposed because no protection motivation would be aroused if the value of any of the three components were zero (Boer and Seydel 1996). Thus, if vulnerability, severity, or response efficacy were zero, intentions to change behaviour would be zero (Block and Keller 1998). The 1975 version of the theory posits two- and three-way interactions among severity, vulnerability, and efficacy (Pechmann, Zhao, Goldberg, and Reibling 2003). Few studies provided support for the multiplicative principle hypothesized by Rogers in 1975, the one exception being Rippetoe and Rogers's study (1987) examining women's intentions to perform breast self-examinations. Several studies (e.g., Griffeth and Rogers 1976; Mewborn and Rogers 1979; Neuwirth, Dunwoody, and Griffin 2000) did not find any interaction effects between the variables on behavioural intentions to carry out a recommended action, suggesting that a multiplicative rule was not operating.

Due to lack of empirical evidence, Rogers (1983) rejected the multiplicative combinatorial rule in favour of an additive model, which included the main effects of severity, vulnerability, response efficacy, and self-efficacy. Rogers (1983) excluded all three-way interactions as well as the two-way interactions of severity with vulnerability and self-efficacy with response efficacy (Pechmann, Zhao, Goldberg, and Reibling 2003). Instead, he proposed two-way interaction effects

between efficacy and severity, and efficacy and vulnerability. In his view, if response efficacy or self-efficacy is high, either high severity or high vulnerability will enhance intentions. The efficacy by severity and/or the efficacy by vulnerability interaction specified in the revised model have not been substantiated (Eagly and Chaiken 1993).

Prentice-Dunn and Rogers (1986, p.156) assumed an additive model within each appraisal process (threat and coping), but stated that when combinations occur between the threat and coping appraisal processes, interaction effects will occur. It was assumed that if response efficacy and/or self-efficacy are high, then increases in severity and/or vulnerability will produce a positive main effect on intentions. On the other hand, if response efficacy and/or self-efficacy are low, increases in severity and/or vulnerability will either have no effect or a boomerang effect, actually reducing intentions to comply with the health recommendations.

According to Weinstein (1993), “this statement is internally inconsistent”. He states that

“if, for example, response efficacy is high and self-efficacy is low, the first part of the statement says that action increases with severity and/or vulnerability, whereas the second part of the statement says that increases in severity and/or vulnerability will either have no effect or will boomerang. It does not seem possible to combine the two components of protection motivation theory, perceptions of the *adaptive response* - which is said to be dependent on the sum of self-efficacy and response effectiveness - and perceptions of the *maladaptive response* - which is said to be dependent on the sum of severity and likelihood – and produce an interaction like that quoted”.

Indeed, many studies investigating the theory have failed to obtain interaction effects between the two processes (e.g., Beck, 1984). In addition, interactions have been obtained between variables operating within the same process (Maddux, Sherer, and Rogers, 1982). Literature showed that high levels of self-efficacy, response efficacy, vulnerability, and severity have not consistently produced the greatest intention to engage in the advocated behaviours, nor have low levels of these factors produced the weakest intention (Browsers and Sorrentino 1993; Rogers and Mewborn 1976).

Pechmann, Zhao, Goldberg, and Reibling (2003) suggested that Rogers's (1983) decision to drop the health risk severity by vulnerability interaction from PMT and to focus on threat by coping appraisal intentions may have been wrong, while his original formulation seems preferable. According to Pechmann, Zhao, Goldberg, and Reibling (2003), recent investigations, including a meta-analysis conducted by Floyd, Prentice-Dunn, and Rogers in 2000, suggested that the two-way interactions might be important after all. Our review is also consistent with this view.

Weinstein (1993) has proposed a weighted additive model in which the prediction of health-protective behaviour can be defined by the following relationship:

$$w_1\text{PROB} + w_2\text{SEV} + w_3\text{EFFECT} - w_4\text{COST}_{\text{PMT}},$$

(where $\text{COST}_{\text{PMT}} = \text{COST} + w_5\text{IR} + w_6\text{ER} - w_7\text{SE}$)

where:

- w_1, w_2, \dots , are parameters (>0) to be determined empirically;
- PROB = perceived probability that a particular outcome will occur (i.e., vulnerability);
- SEV = perceived severity of a health outcome;
- EFFECT = perceived effectiveness of the precaution (i.e., response efficacy);
- COST = perceived cost and barriers to action other than IR, ER, and SE;
- IR = perceived internal rewards from current behaviour;
- ER = perceived external rewards from current behaviour;
- SE = self-efficacy.

Although this weighed additive model has not, to our knowledge, been empirically tested, it makes a valid attempt to mathematically describe the relationships shown in the PMT model in Figure 1. Unlike a simple additive or multiplicative model, Weinstein's (1993) model applies weighting to the PMT variables, implying that the PMT variables are not equal in importance. However, this model does not account for the numerous interactions among PMT variables that have been reported in recent literature and described in the present review.

A new model proposed by the Health Communication Unit at the Centre for Health Promotion at the University of Toronto in collaboration with The Council for a Tobacco-free Ontario and the Program Training & Consultation Centre (2000), citing Witte (1992, 1998), states that the perceived threat determines the strength of the response and perceived efficacy determines the nature of the response (see Figure 2). In sum, when the perceived threat is low, the audience does not worry about efficacy and so they do not respond. When perceived threat is high and perceived efficacy is low(er), the result is avoidance, denial or anger towards the source or issue (fear control). Finally, when perceived threat is high and perceived efficacy is high, the recommended behaviour is adopted (danger control). Consequently, the goal of a public policy announcement is to create a high threat, high efficacy message.

While the concept is simple, its implementation is complex because individual perception of threat and efficacy varies widely. In addition, as the present review illustrates, the relationships between the variables are complex, and the relationships among them and the combinatorial rules people follow when exposed to public service announcements are still unknown. Nevertheless, this model advances the theory and practice by proposing a sequential model of information processing and contradicting the assumption that all PMT variables are processed simultaneously and their effect on persuasion is independent. Our review, in part, supports this model.

In summary, the Health Communication Unit at the Centre for Health Promotion at the University of Toronto in collaboration with The Council for a Tobacco-free Ontario and the Program Training & Consultation Centre (2000) provide the following advice to the practitioners:

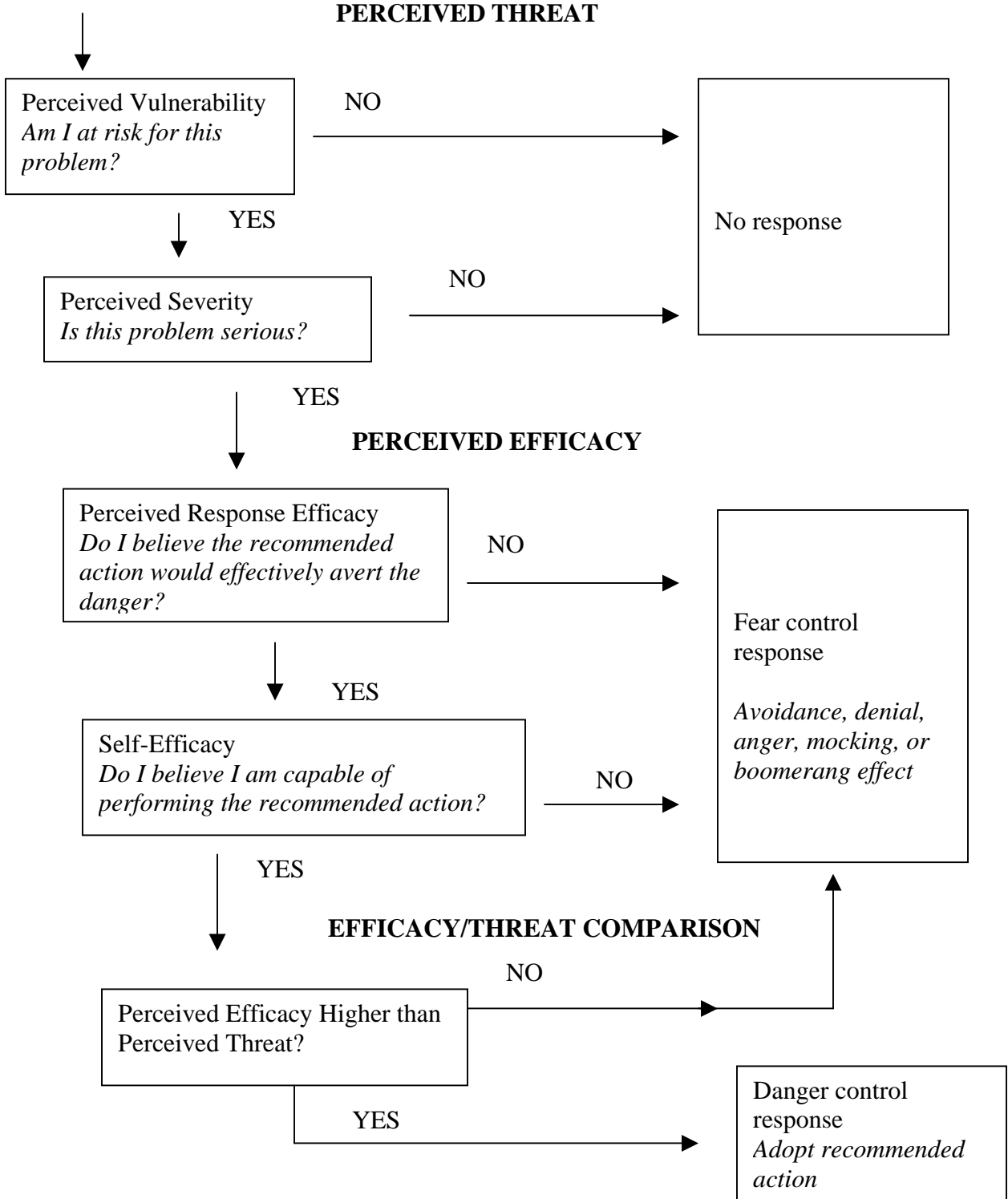
- understand the intended audience;
- clearly define the intended audience and the threat;
- assess and address audience perceived level of threat and perceived efficacy;

- increase perceived threat; and,
- increase perceived efficacy.

In addition to these recommendations, practitioners should be careful when attempting to increase perceived threat and perceived efficacy, for the following reason. Although the Health Communication Unit at the Centre for Health Promotion at the University of Toronto (2000) defines total threat as being the sum of perceived severity and perceived vulnerability and total efficacy as being the sum of response efficacy and self-efficacy, our review shows significant interaction effects among those variables. Consequently, the relationships may be more complex than previously assumed and a higher level of threat might not always be obtained when higher levels of vulnerability and severity are perceived. Since the combined effect of the PMT variables on persuasion measures is still unclear, we advise public service communicators to pre-test their advertising campaigns to decrease the risk of weak results due to interactions among variables.

Figure 3: Audience Analysis of Message

INCOMING MESSAGE



(Adapted from Witte, 1992, cited by the Centre for Health Promotion University of Toronto, 2000)

Summary and Conclusions

Researchers in the field of communication have long attempted to understand the factors that influence the persuasiveness of public service announcements. Many theoretical frameworks have been advanced, the most comprehensive one being Protection Motivation Theory (PMT). According to PMT, four factors influence the persuasiveness of a health appeal: vulnerability, severity, efficacy, and costs. It is expected that the higher the perceived vulnerability, severity, and efficacy, and the lower the perceived costs, the more likely the audience is to adopt the recommended behaviour. In addition, efficacy and costs were found to have the biggest impact on persuasion, whereas vulnerability and severity the least. Consequently, communication appeals advocating that people change their behaviour by threatening them and providing information about what they need to do to avoid the possible danger are expected to work when people have strong efficacy perceptions, but they can fail when people have low efficacy perceptions (Witte, 1998). As well, health communicators need to find ways to bolster the consumer's confidence, so that consumers' level of self-efficacy will remain high. If consumers are not confident that they can carry out the recommended behaviour, the persuasiveness of the communication will be affected, since self-efficacy is an important driver of protection motivation. Self-efficacy influences perceived vulnerability. As such, developing communications that encourage high levels of self-efficacy will improve the likelihood of attitudinal and behavioural change.

The literature reflected uncertainty of the interaction effects among PMT variables. In this paper, we systematically reviewed the literature of interest and provided evidence of multiple interaction effects documented in the literature. These interaction effects are of importance for marketing communicators because the overall persuasiveness of a public service communication is not the sum of the individual effects, as widely assumed. In other words, because of these interaction effects, we can expect higher levels of threat and efficacy to be less persuasive than

lower levels of threat and efficacy. Consequently, we advise practitioners to consult this list of interaction effects when attempting to increase the persuasion of health messages by providing and/or manipulating information about vulnerability, severity, efficacy, and costs. Pre-testing messages would also be helpful in avoiding failures. In addition, as specified by Witte (1993), a thorough knowledge of the targeted audience will help practitioners to design more successful public service campaigns.

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About the Author

Magdalena Cismaru holds a Ph.D. in marketing from the C.T. Bauer College of Business at the University of Houston in Houston and a Bachelor of Economics from the College of Commerce at the Academy of Economic Studies in Bucharest. Dr. Cismaru is presently an Assistant Professor of Marketing in the Faculty of Business Administration at the University of Regina. She is active across several professional marketing organizations. Her research focusing on medical decision-making contributes to the field in both theoretic and applied areas.

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