

A Preventive Coping Perspective of Individual Response to Terrorism in Canada

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Abstract A plethora of studies on terrorism underscores the challenges of managing the psychological and behavioural impacts of terrorist events. This literature also emphasizes the idea that the global *pending* threat of terrorism, prior to the occurrence of any event, may also give rise to significant reactions among members of the public. Drawing from the literature on proactive coping, the current study presents the results of factor analyses performed on sections of a national survey that assessed appraisals of as well as actual responses to the threat of terrorism in Canada ($N=1,502$). Findings revealed that items assessing individual response to terrorism were represented by three factors in this context: Individual Preparedness, Information Seeking, and Avoidance Behaviour. Further analyses demonstrated a tendency for actual preparedness behaviours to be associated with decreased psychological stress, and actual avoidance behaviours to be associated with heightened psychological stress. Furthermore, the divergent patterns of relationships of terrorism response appraisals and corresponding actual responses with psychological stress emphasized the need to distinguish different stages in the process of preventive coping with terrorism. Theoretical and practical implications of findings for individual preparedness in Canada are discussed.

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Much emphasis has been put on the need to acknowledge and understand the longer-term, indirect behavioural and psychological effects of terrorist events in recent years (Hyams et al. 2002; Malin and Fowers 2004; Stein et al. 2004). Indeed, research on the psychological effects of specific attacks is a necessary component in the development of policies aimed at improving preparedness and response to future events. However, more comprehensive preparedness strategies should address the fact that individuals' reactions to terrorism may vary across all phases relative to the occurrence or anticipation of an event. For example, while public interest in preparedness may be high following an attack, it is less clear how individuals might respond to terrorism as an uncertain, potential future threat. From the perspective psychological stress and coping theory, the current study addressed this gap by examining individual response to terrorism as a *pending global threat*. Given Canada's history of terrorism with few actual incidents, but significant threats, Canadians represent a particularly suitable group to examine this issue.

Known for its objective of evoking considerable fear among targeted populations (Becker and Rubinstein 2004; Sunstein 2003), terrorism has been found in several studies to give rise to a high degree of stress (Schuster et al. 2001; Rubin et al. 2005a). Above and beyond pervasive stress reactions, however, it is important to recognize other important responses that may occur because of terrorism, such as the cognitive or behavioural strategies individuals adopt to cope with this threat.

One of the most prominent theories of stress and coping, cognitive-appraisal theory (Lazarus and Folkman 1984), posits that individuals consciously and deliberately adopt strategies to cope with events or situations they deem threatening. Often, distinctions are made between coping efforts aimed directly at dealing with the problem (problem-focused coping) and those aimed at managing the stress (emotion-focused). However, other research has underscored the limitations of this approach. For instance, it has been suggested that coping be characterized according to whether efforts to deal with the threat are behavioural or cognitive in nature, and whether they reflect attempts to avoid confronting the problem (Billings and Moos 1981; Lemyre and Lee 2006; Moos and Schaefer 1993; Savoie 1999).

Research on coping with terrorism in particular has mainly focused on the public's coping reactions to a specific attack. In one American study on life changes following the attacks of September 11, 2001, approximately one quarter of participants reported having limited their outdoor activities or changed their preferred mode of transportation (Torabi and Seo 2004). In other studies, seeking social support through talking to others about one's thoughts and feelings emerged as a top reaction, as did, to a lesser extent, turning to prayer, religion, or spirituality (Rubin et al. 2005a, b; Schuster et al. 2001; Torabi and Seo 2004; Wadsworth et al. 2004).

Expanding on this work, Wadsworth and her colleagues (2004) examined which types of coping were most helpful in a sample of Americans following the

attacks of September 11, 2001. Based on the Responses to Stress Model, they examined involuntary stress responses (that is, automatic cognitive, behavioural, or physiological stress responses) as well as voluntary, more effortful stress responses. Results revealed that voluntary stress responses that were aimed at directly resolving the stressful problem or emotional responses to the problem (in this case, the attacks of September 11, 2001) were associated with better mental health. By contrast, voluntary stress responses that were aimed at avoiding the stressful problem or emotional responses to the problem, along with involuntary stress responses were associated with poorer mental health.

Findings of Wadsworth et al.'s (2004) study point to the adaptive nature of cognitive and behavioural approach coping, and to the generally maladaptive nature of avoidance-type coping with terrorism. With its focus on coping after the occurrence of an event, however, this research provides less information on the nature and efficacy of coping in preparation or anticipation of terrorism as a pending threat. Examining such responses may be of interest, as there is preliminary evidence suggesting that individuals also cope with terrorism by preparing for potential future attacks (Schuster et al. 2001; Torabi and Seo 2004). Indeed, 15% of Americans surveyed by Torabi and Seo (2004) and 18% of Americans surveyed by Schuster et al. (2001) reported having gathered emergency supplies. Without overlooking the fact that participants of these studies were reporting the extent to which they had done so as a result of the attacks of September 11, 2001, these findings illustrate how coping with terrorism can be aimed at dealing with uncertain future threats. These observations are important and promising with regards to promoting a much needed engagement of individuals and communities in emergency preparedness. Such findings also touch upon a growing trend in the literature on stress and coping.

In recent years, the concept of coping has come to include reactive strategies adopted by individuals in response to past stressful events, as well as anticipatory or proactive strategies they may take to deal with potential and uncertain future events (Aspinwall and Taylor 1997; Greenglass et al. 1999; Schwartz and Taubert 2002). Moreover, there is increased recognition of the multiple functions of coping in not only preventing bad outcomes, but also promoting positive outcomes (Greenglass 2002). In Proactive Coping Theory, for example, four types of coping responses are distinguished according to whether they are aimed at a past or future threat. Individuals are said to engage in *reactive coping* in response to harm or loss experienced in the past, whereas they are said to engage in *anticipatory coping* in response to an imminent threat in the near future. *Preventive coping* refers to actions aimed at dealing with an uncertain potential threat in the distant future, whereas *proactive coping* is aimed at dealing with upcoming challenges that are seen as potentially self-promoting (Aspinwall and Taylor 1997; Greenglass et al. 1999; Schwartz and Taubert 2002).

The integration of a time perspective into the conceptualization of coping in Proactive Coping Theory provides a potential basis on which to understand individual response to terrorism as a potential future threat. Given that no terrorist attack has recently taken place on Canadian soil and that the occurrence of attacks in the future remains uncertain, it might be useful to conceptualize individual responses to terrorism as examples of preventive coping. However, steering away from the

examination of responses to a specific attack also calls for a different conceptualization of the stress response. More specifically, it may be more useful to examine stress as a “state of ‘normal’ tension, preoccupation, and agitation/.../[that encompasses] a set of affective, cognitive, somatic, and behavioural manifestations within the range of functional integrity” (Lemyre and Tessier 2003, p. 1159), rather than a psychopathological posttraumatic experience.

Study Objectives

By combining the perspectives discussed above, the overarching aim of the current study was to improve understanding of individual response to terrorism in Canada. Based on results of previous qualitative studies on Canadians’ anticipated threat and behaviours surrounding terrorism (Gibson et al. 2007; Lee 2008)¹, a survey was developed to systematically assess perceived terrorism threat and individual response in a nationally representative sample (Lemyre et al. 2005, 2006, 2007a, b). A series of factor analyses were carried out on this data in order to identify different types or dimensions of individual response to terrorism in Canada. In addition, the extent to which various types of individual response to terrorism are associated with psychological stress was explored in order to shed light onto responses that might help individuals better adapt to this global pending threat.

Method

Participants

A nationally representative sample of 1,502 respondents participated in telephone interviews, 48.7% of which were men and 51.3% of which were women. Respondents were categorized into six age groups: 18 to 24 (representing 11.7% of participants), 25 to 34 (16.7%), 35 to 44 (22.6%), 45 to 54 (19.4%), 55 to 64 (13.1%), and 65 years of age or older (16.0%) (0.4% refused to disclose this information). A percentage of 57.9 of respondents had achieved college education or less (CEGEP in Quebec) while 41.6% had some university education or more (0.5% refused to disclose this information). Finally, 77.2% of the interviews were conducted in English and 22.8% were conducted in French. Of the total 28,648 phone numbers dialled, 4,910 were not valid, 8,284 were unanswered, 12,039

¹ In brief, results of these studies suggested that Canadians were not threatened by the possibility of an incident on Canadian soil and that few had changed their habits or behaviours because of the threat of terrorism (Gibson et al. 2007; Lee 2008). Nonetheless, a few participants reported avoiding certain activities, places, or people (for example, air travel, large cities or countries perceived as targets) to cope with their fear of experiencing an attack (Gibson et al. 2007; Lee 2008). A small proportion of respondents also reported taking measures to prepare for terrorism or using strategies to regulate their emotional responses to this threat (Gibson et al. 2007; Lee 2008). Although relatively infrequent, individual response to terrorism as a pending threat thus emerged as a multifaceted construct encompassing several dimensions, including efforts aimed at avoiding terrorist events, individual preparedness and planning, and emotion-focused behaviours (Lee 2008).

resulted in a refusal, 1,483 required a call-back, and 430 were addressed to individuals with demographic characteristics of quotas already met.

Measures

Development of the survey questionnaire was largely based on the results of two previous qualitative studies (Gibson et al. 2007; Lee 2008). It included sections to assess (1) public perceptions of different types of terrorism (chemical, biological, radiological, nuclear and explosives [CBRNE] terrorism) and their related impacts on communities, (2) beliefs about preparedness initiatives and individual response to terrorism, and (3) information seeking practices. Information on the survey questionnaire has been provided elsewhere (Lemyre et al. 2005, 2006, 2007a, b). Only the section of interest to the present study is discussed below in detail. Respondents provided their answers using a five-point Likert-type scale (1=not at all, 2=a little, 3=moderately, 4=very much, and 5=extremely). When they reported not knowing what to answer or had no opinion, ratings of 0 (don't know/no opinion) were assigned.

Individual response to terrorism In the previous qualitative studies, few respondents reported having made any behavioural changes because of the threat of terrorism. However, a number of respondents expressed having thought about doing so (Gibson et al. 2007; Lee 2008). It was therefore decided to include questions that assessed the extent to which respondents had thought about engaging (deemed *appraisals*) in addition to questions on the actual level of engagement in different behaviours in response to terrorism (deemed *actual responses*), as this approach would tap into a wider range of response.

Respondents were asked how much they had *thought about* and how much they had *actually done* the following: (1) consulting others for preparedness advice, (2) establishing an emergency plan, (3) putting together an emergency supply kit, (4) receiving emergency First Aid or CPR training, (5) obtaining information about potential shelters in their community, (6) establishing a meeting area or method of contact with loved ones, (7) learning about evacuation plans of buildings occupied frequently, (8) learning about differences and similarities between different types of terrorism, (9) reading up on the topic of terrorism, (10) avoiding public places, (11) refraining from watching the news to avoid coverage on terrorism issues, (12) being nervous around certain people, and (13) seeking social support. The order of items was randomized in order to control for possible order effects.

Psychological stress Psychological stress was assessed using Lemyre and Tessier's (2003) nine-item Psychological Stress Measure (PSM). The nine-item PSM (PSM-9) is a brief self-report paper and pencil questionnaire designed to measure the subjective experience of stress within a non-pathological population. Items consist of statements that reflect somatic, behavioural, and cognitive-affective symptoms of stress. Respondents indicate the frequency with which they have experienced each symptom in the past four to five days on an eight-point Likert-type scale (1=not at all, 8=extremely). The PSM-9 has been found to have good reliability

(yielding Cronbach's alphas between 0.89 and 0.92; Lemyre and Tessier 2003; Lemyre and Lee 2006) and construct validity.

Procedure

Telephone interviews of approximately 35 minutes in length were conducted between November 15, 2004 and December 15, 2004 in the official language of respondents' choice. The sample was stratified by region (Atlantic: Newfoundland, Prince Edward Island, Nova Scotia, and New Brunswick; Quebec; Ontario; Prairies: Manitoba and Saskatchewan; Alberta; and British Columbia), as well as age group (18–34, 35–54, and 55 years or over) and sex within region according to Census data. Households of potential respondents were identified through random digit dialling.

Data Analyses

Exploratory factor analysis In order to obtain empirical grounds for confirmatory factor analyses (CFAs) of items reflecting response appraisals and actual responses to terrorism, exploratory factor analyses (EFAs) were first conducted on data from a randomly-derived sub-sample of 50% of cases using SPSS ($n=751$). Examination of the distribution of these items revealed severe Skewness. A high proportion of respondents (close to 50% or higher) selected a rating of 1 (not at all). It was therefore decided to dichotomize response variables: Ratings of 1 were assigned a value of 1 (not at all) and ratings between 2 and 5 were assigned a value of 2 (at least a little). Dichotomized variables were then subjected to EFAs using MPlus version 4.1 software (Muthén and Muthén 2006). This software uses tetrachoric correlations to estimate latent factor models with binary data, using weighted least-squares with mean and variance adjustment (wlsmv) estimation as a default. Work by Muthén, DuToit, and Spisic has found this method of estimation to be a more optimal choice for binary data (University of Texas at Austin 2000).

Confirmatory factor analysis Also using MPlus version 4.1 software (Muthén and Muthén 2006), a set of CFAs of items reflecting response appraisals and actual responses to terrorism was conducted on the dichotomized data from the remaining 751 cases. These were carried out in order to test the factorial validity of the models derived from results of the EFAs. Model fit was evaluated on multiple criteria: (1) the χ^2 likelihood ratio statistic, (2) the comparative fit index (CFI; Bentler 2001), and (3) the residual mean-square error of approximation (RMSEA). The χ^2 likelihood ratio statistic measures the closeness of fit between the observed covariance matrix and the fitted covariance matrix. Small values that approximate the number of degrees of freedom are generally viewed as being indicative of a good fit (Byrne 1994). While the χ^2 likelihood ratio statistic is a useful measure of fit, it is highly sensitive to sample size. Consequently, significance may be observed even for well-fitting models (Byrne 1994). Use of the CFI as a practical index of fit is therefore recommended (Byrne 1994). Based on the χ^2 statistic, the CFI is derived from the comparison of the restricted model with that of the independence model to determine goodness-of-fit. Values range from 0 to 1.0, with values of at least 0.90

indicating an acceptable fit (Byrne 1994). As an alternative index, the RMSEA estimates a model's lack of fit compared to a perfectly fitting model. Values lower than 0.08 are considered to indicate adequate fit (Browne and Cudeck 1993).

Regression analysis predicting psychological stress Last, a sequential multiple regression analysis was performed to examine relationships of the resulting dimensions of response appraisals and actual responses to terrorism with psychological stress, controlling for demographic variables.

Results

Results of Exploratory Factor Analyses

Prior to analyses, data were screened for outliers and violations of assumptions inherent to EFA with binary data. Results of analyses including all cases with complete data are presented below.

Exploratory factor analyses were performed using *wlsmv* estimation and varimax rotation, for a final sample of $n=730$ for the analysis involving items assessing response appraisals and $n=722$ for the analysis involving items assessing actual responses².

With eigenvalues of at least 1 as a criterion, an initial freely estimated solution produced two factors for the analysis involving response appraisals. However, a three-factor solution was retained as interpretability of the factors was much clearer in this model. Factor loadings are presented in Table 1. The first factor consisted of items reflecting appraisals of planning and taking measures to prepare for a possible terrorist event and was therefore named Individual Preparedness Appraisals. Loaded by two items reflecting appraisals of obtaining information about terrorism, the second factor was named Information Seeking Appraisals. The items that loaded onto the third factor either involved appraisals of avoiding something related to terrorism or those related to certain scenarios that might be deemed uncomfortable. This factor was therefore named Avoidance Behaviour Appraisals.

For the analysis involving actual responses, eigenvalues and interpretability of factors suggested that data could be represented by a three-factor structure. Although items did not load in precisely the same rank order as they did in the previous analysis, they loaded onto factors in a similar fashion. The three factors were therefore named Actual Individual Preparedness, Actual Information Seeking, and Actual Avoidance Behaviour. Factor loadings are presented in Table 2.

Results of Confirmatory Factor Analyses

Data from the remaining cases were subjected to a series of CFAs in order to test the fit of three-factor models of response appraisals and actual responses to terrorism.

² It was decided not to replace values of 0=don't know/no opinion because respondents actively selected these values, rendering them non-equivalent to missing values.

Table 1 Factor loadings of three-factor exploratory factor analysis of items assessing terrorism response appraisals

Item	F1	F2	F3
Obtain information about shelters	0.76		
Establish emergency plan	0.71		
Establish meeting area/contact method	0.70		
Put together emergency supply kit	0.66		
Consult others for preparedness advice	0.63		
Learn about evacuation plans	0.57		
Seek social support	0.51		
Receive first aid or CPR training	0.47		
Learn about terrorism types		0.86	
Read up on terrorism		0.58	
Nervous around certain people			0.69
Avoid public places			0.45
Refrain from watching terrorism news			0.35

Emerging solution based on eigenvalue criterion of 1 and interpretability of factors; factor labels were F1= Individual Preparedness Appraisals, F2=Information Seeking Appraisals, and F3=Avoidance Behaviour Appraisals

Prior to this, data were examined for outliers and violations of assumptions inherent to CFA. Some multivariate outliers were identified, but these were on fewer than 5% of cases and their removal from the analyses did not yield any changes in results. Therefore, results of analyses including all cases with complete data are presented

Table 2 Factor loadings of three-factor exploratory factor analysis of items assessing actual responses to terrorism

Item	F1	F2	F3
Establish meeting area/contact method	0.77		
Obtain information about shelters	0.76		
Establish emergency plan	0.75		
Put together emergency supply kit	0.69		
Consult others for preparedness advice	0.62		
Learn about evacuation plans	0.56		
Seek social support	0.51		
Receive first aid or CPR training	0.50		
Learn about terrorism types		0.97	
Read up on terrorism		0.55	
Nervous around certain people			0.60
Refrain from watching terrorism news			0.54
Avoid public places			0.44

Emerging solution based on eigenvalue criterion of 1 and interpretability of factors; factor labels were F1= Actual Individual Preparedness, F2=Actual Information Seeking, and F3=Actual Avoidance Behaviour

below, for a final sample of $n=724$ for the analysis involving response appraisals and $n=718$ for the analysis involving actual responses.

For the CFA involving response appraisals, an examination of the χ^2 likelihood ratio statistic indicated some degree of misfit between the proposed model and the data; $\chi^2(32)=2,072.61, p<0.001$. As recommended, the CFI was employed as a practical index of fit (Byrne 1994). A value of 0.99 suggested good model fit, which was confirmed by a low RMSEA value of 0.33.

The CFA involving actual responses also yielded some degree of misfit according to the χ^2 likelihood ratio statistic, $\chi^2(32)=2,072.61, p<0.001$. Nevertheless, a CFI value of 0.99 and RMSEA value of 0.02 were yielded by the analysis. The three-factor models are shown in Figs. 1 and 2 along with estimates for each parameter. Circles represent the latent variables (factors) and rectangles represent the measured variables (individual response items). Absence of an arrow connecting variables indicates that no direct relationship is hypothesised among them.

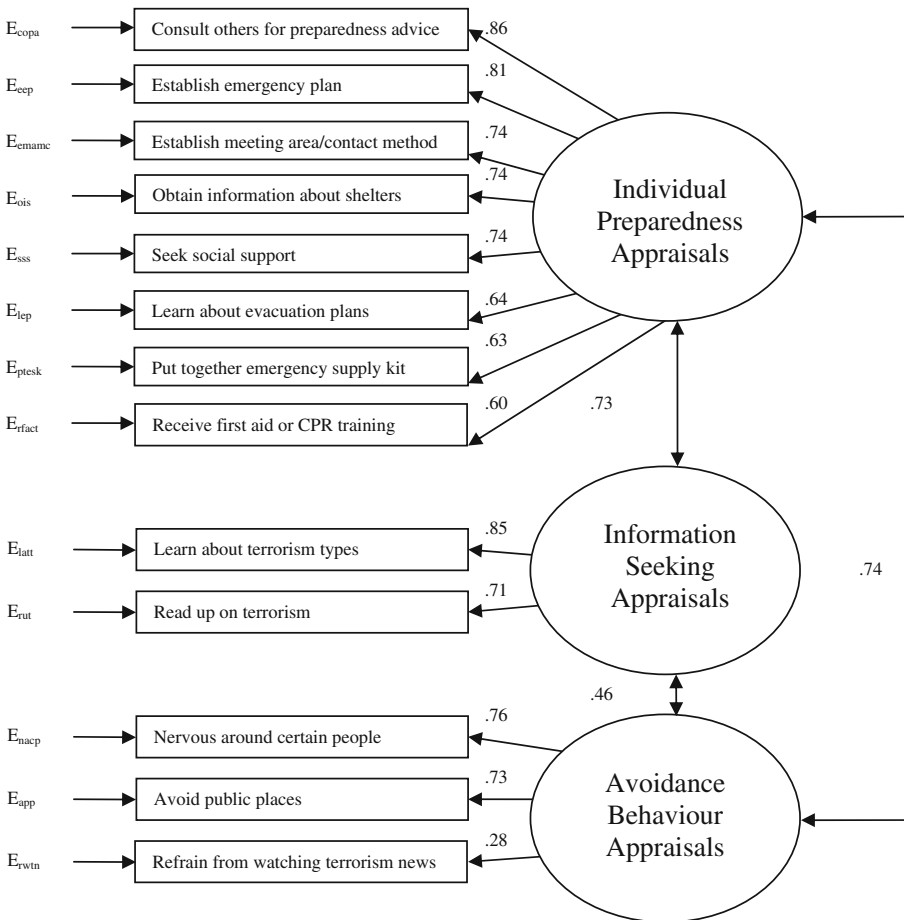


Fig. 1 Diagram of the three-factor model of terrorism response appraisals with estimated parameter loadings

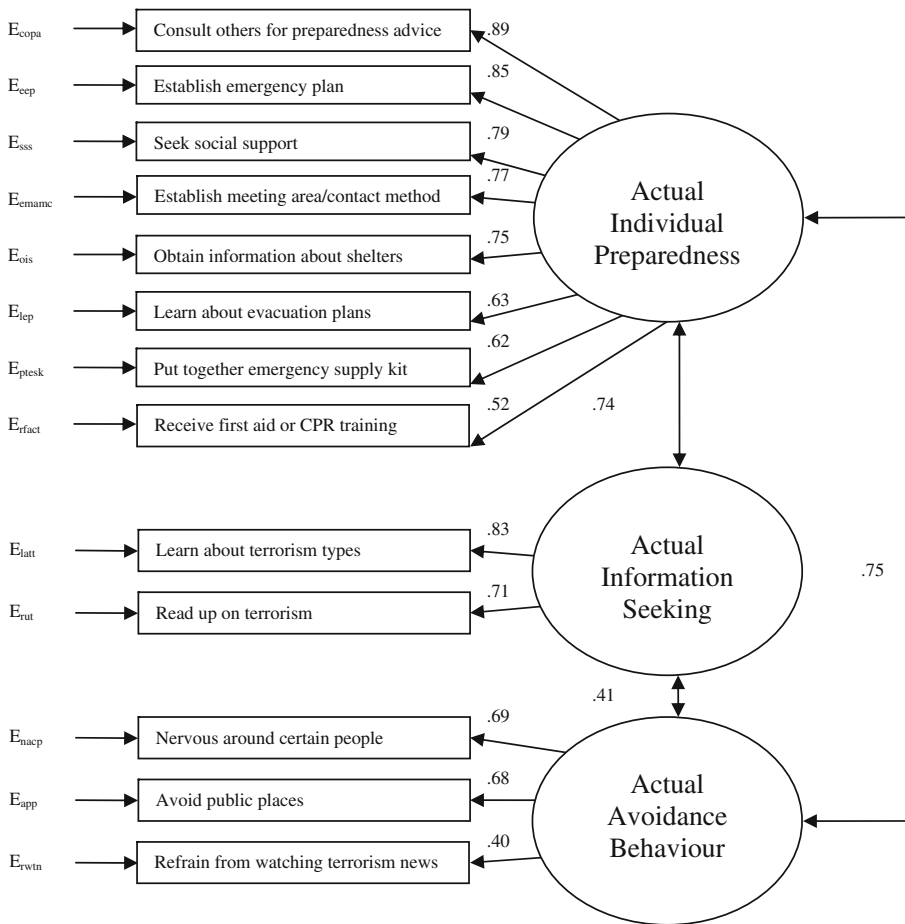


Fig. 2 Diagram of the three-factor model of actual terrorism response with estimated parameter loadings

Results of the Regression Analysis Predicting Psychological Stress

Based on results of factor analyses, scales measuring appraisals of each type of behaviour as well as actual responses were computed by summing scores on the appropriate items. Sequential linear regressions were conducted to determine if adding dimensions of actual responses improved statistical prediction of psychological stress beyond that afforded by dimensions of response appraisals. Age, education, and sex were entered as covariates in a first step of this analysis, as these were found to be significantly associated with psychological stress. More specifically, higher psychological stress was observed among respondents of lower age and education, as well as female respondents. Prior to the analysis, variables were screened for violations of assumptions. Using a Mahalanobis criterion of 0.001 ($\chi^2=29.59$), nine multivariate outliers were identified and deleted from the analysis, $N=1,397$. Table 3 displays the standardized and unstandardized regression coefficients, as well as the adjusted R^2 after each step of this analysis.

Table 3 Demographic variables, response appraisals and actual responses to terrorism as predictors of psychological stress

Predictor	<i>B</i>	SE <i>B</i>	<i>B</i>	Adjusted <i>R</i> ²
Step 1				
Age	-1.24	0.18	-0.18***	
Education	-1.04	0.27	-0.10***	
Sex	2.41	0.58	0.10***	0.05***
Step 2				
Age	-1.23	0.18	-0.18***	
Education	-.95	0.27	-0.09***	
Sex	1.79	0.57	0.08**	
Individual Preparedness Appraisals	0.39	0.15	0.08**	
Information Seeking Appraisals	-0.65	0.39	-0.05	
Avoidance Behaviour Appraisals	2.26	0.35	0.19***	0.09***
Step 3				
Age	-1.19	0.18	-0.17***	
Education	-0.89	0.27	-0.09***	
Sex	1.69	0.57	0.08**	
Individual Preparedness Appraisals	0.78	0.25	0.16**	
Information Seeking Appraisals	-0.31	0.71	-0.02	
Avoidance Behaviour Appraisals	0.79	0.62	0.07	
Actual Individual Preparedness	-0.54	0.28	-0.10*	
Actual Information Seeking	-0.29	0.70	-0.02	
Actual Avoidance Behaviour	1.87	0.65	0.14**	0.10***

$\Delta R^2 = 0.05$ for step 2 ($p < 0.001$); $\Delta R^2 = 0.01$ for step 3 ($p < 0.05$)

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Controlling for age, education and sex (with male sex as the reference category), dimensions of response appraisals significantly predicted psychological stress with an adjusted $R^2 = 0.09$, $F(6, 1,390) = 24.86$, $p < 0.001$. Specifically, Individual Preparedness and Avoidance Behaviour Appraisals both emerged as significant positive predictors of psychological stress. Adding dimensions of actual responses in a next step improved the prediction of psychological stress, $\Delta R^2 = 0.01$, $\Delta F(3, 1,386) = 3.59$, $p < 0.05$. In this step, Actual Avoidance Behaviour emerged as a significant positive predictor of psychological stress, while Actual Individual Preparedness significantly *negatively* predicted psychological stress. The final model yielded an adjusted R^2 of 0.10, $F(9, 1,387) = 17.87$, $p < 0.001$. Thus, it accounted for 10% of the variance in current psychological stress.

Discussion

The importance of understanding the longer-term, psychological effects of terrorism is undisputed, as these pose some of the greatest challenges to terrorism risk

management (Hyams et al. 2002; Stein et al. 2004). Taking a coping with stress perspective, a primary objective of the current study was to examine the nature of individual response to terrorism as a form of preventive coping with this pending global threat in Canada. Overall, results suggest that three dimensions underlie both appraisals of and actual responses to terrorism in this context; namely, Individual Preparedness, Information Seeking, and Avoidance Behaviour. In a second step, a regression analysis was performed to examine relationships of these dimensions with psychological stress. It was found that terrorism response appraisals explained 9% of the variance in psychological stress and that actual responses accounted for an additional 1%. An examination of relationships between dimensions of individual response and psychological stress revealed a number of important findings.

In addition to providing converging evidence that individual response to terrorism encompasses several dimensions (Lee 2008), results confirm that the popular conceptualization of coping as either problem-focused or emotion-focused does not fully capture the essence of such responses. This very point was made by Maguen and colleagues who noted that “the categorical distinction between emotion- and problem-focused coping falls short when applied to coping with impending threat” (Maguen et al. 2008, p. 18). Rather, findings of the current study provide a stronger basis for the distinction of different types of individual response to terrorism according to whether they reflect behavioural or cognitive efforts to resolve the issue, and whether they are aimed at avoiding the issue (Billings and Moos 1981; Lemyre and Lee 2006; Moos and Schaefer 1993; Savoie 1999). For instance, individual preparedness may be characterized as a behavioural approach to coping, while avoidance behaviour clearly reflects avoidance coping. The conceptualization of information seeking as cognitive coping is perhaps less straightforward, although seeking information and learning about terrorism may be regarded as strategies used to address cognitive uncertainties surrounding this threat.

In general, observed relationships between different dimensions of preventive coping and psychological stress were consistent with findings of previous studies on reactive coping (Liverant et al. 2004; Silver et al. 2002). Similar to past research on coping with the attacks of September 11, 2001, in which coping through denial, behavioural or mental disengagement was associated with increased psychopathology (Liverant et al. 2004; Silver et al. 2002), the use of actual avoidance behaviour as a form of preventive coping was associated with greater psychological stress. By contrast, actual individual preparedness was associated with lower psychological stress.

Previous findings on the relationship between approach coping strategies and psychopathology following a terrorist event have been less consistent than those pertaining to avoidant coping behaviours. For instance, one study revealed that the use of active coping was associated with decreased psychological distress following the attacks of September 11, 2001 (Silver et al. 2002), while another study revealed no relationship between this type of coping and psychopathology (Liverant et al. 2004). Failure to account for the different stages of coping with terrorism or the specific context of exposure to the threat in these previous studies may be one factor contributing to inconsistent findings.

Wadsworth et al. (2004) first touched upon the idea of examining different stages of coping with terrorism through their investigation of involuntary and voluntary

stress responses following the attacks of September 11, 2001. In addition to observing differential relationships of corresponding forms of involuntary and voluntary coping with anxiety, these authors suggested that initial involuntary stress responses might influence stress outcomes through their influence on later, more voluntary coping responses. Since their research focused on reactive rather than preventive coping, it is not clear to what extent their Response to Stress Model of coping would be relevant to individual response to terrorism in Canada. Some parallels may still be drawn between this perspective and the distinction of response appraisals and actual responses in the current study.

Of particular note, important differences were observed in the patterns of relationships of terrorism response appraisals with psychological stress compared to those of corresponding actual responses. For instance, no relationship was observed between appraisals of avoidance behaviour and psychological stress, while actual avoidance behaviour was associated with greater psychological stress. Also, appraisals of individual preparedness were associated with higher psychological stress, whereas actual individual preparedness was associated with lower psychological stress. Like Wadsworth et al.'s findings (2004), these results emphasize the importance of making distinctions between the different stages of action that may characterize individual response to terrorism. In particular, response appraisals might be regarded as initial responses to psychological stress that arise from the threat of terrorism, and may act as precursors to actual engagement in corresponding coping responses.

Taken together, these findings have a number of implications for the management of terrorism risk. On the theoretical front, individual response to terrorism might be understood using a framework similar to stages of change models in health psychology, which specify the series of stages through which individuals move as part of the process of adopting healthier behaviours (for example, pre-contemplation, contemplation, preparation, action, and maintenance; Prochaska and Velicer 1997). Future research might then aim at examining more intricate aspects of the process of preventive coping with terrorism. In particular, one objective might entail identifying the factors at play as individuals move from one stage of coping to the next. Ultimately, such research could help to inform the development of strategies to ensure that individuals who are at one stage of the process appropriately move forward to the next stage, for example, by engaging in more adaptive coping responses (individual preparedness) and limiting engagement in possibly less adaptive coping responses (avoidance behaviour). Establishing a sense of self-efficacy with regards to carrying out the change is one approach (Bandura 1977; DiClemente et al. 1985).

Since the attacks of September 11, 2001, increasing efforts have been expended on informing the public about how to prepare for CBRNE events and other types of emergencies (for example, bomb threats, chemical releases, nuclear emergencies, and suspicious packages) (Public Safety Canada 2007). On the practical front, the present findings underscore the importance of ensuring that individuals not only think of preparedness in response to these efforts, but also actually engage in such activities. Complementing informational campaigns with more interactive approaches such as emergency community-based drills and exercises may represent a useful strategy to reduce psychological stress and foster resiliency among

individuals and communities. Such approaches are not only noted for their positive impacts on participants, but also for their potential to reach a wider spectrum of population subgroups (Nelson and Perry 1991; Simpson 2002). Furthermore, the element of practice can promote self-efficacy in relation to coping with a potential scenario. Nevertheless, the effectiveness of either approach will depend on the extent to which individuals and communities have the necessary resources available for sustained preparedness. Research on disasters has identified a number of community-level barriers to preparedness, including weakened community structures and the communication challenges posed by multicultural environments (Finnis 2004).

As a final point, some study limitations and alternative interpretations of findings must be acknowledged. First, while psychological stress was conceptualized and discussed as an outcome in the present study, the cross-sectional nature of the current study does not rule out the possibility that pre-existing levels of psychological stress influenced individuals' propensity to engage in individual response to terrorism. From this perspective, findings might be considered to reflect the role of psychological stress as a barrier to actual individual preparedness for terrorism, rather than the role played by actual individual preparedness in reducing psychological stress. Further research into the sequential nature of these relationships needs to be pursued. Second, the impact of a low response rate on the interpretation of findings should be considered. In particular, this limitation raises questions about the generalizability of findings to the general Canadian population. Still, the fact that the sample reflected the profile of the Canadian population in terms of region, as well as age and sex within region based on 2001 Census data is noteworthy.

To conclude, this study is among the first to examine individual response to terrorism from within a coping with stress framework, prior to the occurrence of an event. In fact, no research of near magnitude had yet examined these aspects of individual response to terrorism within the Canadian context at the time the survey took place, rendering this work a meaningful contribution. Understanding individual responses to terrorism as preventive coping responses to a pending threat can be particularly informative to the design of more effective strategies aimed at improving preparedness for terrorism. Doing so is also more in line with recent calls for a shift from reactive to proactive emergency management (Henstra and McBean 2005). Even if the chance of an attack is remote, the potential magnitude of consequences emphasizes the value of approaches that enable individuals and communities to develop the necessary skills to cope with a potential future emergency.

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