PTSD and Depression After the Madrid March 11 Train Bombings

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The March 11, 2004, train bombings in Madrid, Spain, caused the largest loss of life from a single terrorist attack in modern European history. We used a cross-sectional random digit dial survey of Madrid residents to assess the prevalence of posttraumatic stress disorder (PTSD) and major depression in the general population of Madrid 1 to 3 months after the March 11 train bombings. Of respondents 2.3% reported symptoms consistent with PTSD related to the March 11 bombings and 8.0% of respondents reported symptoms consistent with major depression. The prevalence of PTSD was substantially lower, but the prevalence of depression was comparable to estimates reported after the September 11 attacks in Manhattan. The findings suggest that across cities, the magnitude of a terrorist attack may be the primary determinant of the prevalence of PTSD in the general population, but other factors may be responsible for determining the population prevalence of depression.

On the morning of March 11, 2004, 10 bombs left on four commuter trains in Madrid caused 191 deaths and injured more than 1,800 persons. It was the largest loss of life from a single terrorist attack ever in modern European history. In the days immediately after March 11, the attacks dominated national and international news, up to 2 million Madrilenos participated in protest demonstrations throughout the country, and a previously scheduled national election resulted in an upset election of the opposition party to power.

It has long been established that individual exposure to traumatic events (e.g., motor vehicle accidents, sexual assault) is associated with a substantial psychological burden (Foa, Davidson, & Frances, 1999; Norris, Friedman, & Watson, 2002b; Norris et al., 2002a), which probably starts in the immediate aftermath of the traumatic exposure and may persist in some persons for years after this exposure (North et al., 1999; Shalev, Tuval-Mashiach, & Hadar, 2004). More recently it has also been shown that persons who are exposed to mass traumatic events (e.g., hurricanes,

industrial explosions) are also at risk for development of mental health problems after such events (Miguel-Tobal, González Ordi, & Ortega, 2000). Studies that have assessed persons exposed to such disasters have documented mental health problems both among those who were immediate victims of these events (i.e., persons who were direct witnesses of the events), as well as among persons who were distant from the events but were indirectly affected by them (Schlenger et al., 2002). Existing studies also suggest that the psychological consequences of human-made disasters may be more profound in the general population than they are after natural disasters (Norris et al., 2002a, 2002b).

Terrorism represents an emerging threat of mass trauma that has the potential to affect large numbers of persons worldwide substantially. Research conducted in the aftermath of the Oklahoma City bombing of the Murrah Federal Building in 1995 showed that 34.3% of persons who were direct victims of the attacks suffered from posttraumatic stress disorder (PTSD) in the first 6 months after the attacks and 22.5% suffered from depression (North et al., 1999). A nationally representative study in Israel showed that 9.4% of the population had symptoms consistent with past-month PTSD (Bleich, Gelkopf, & Solomon, 2003). These findings are consistent with those documented in two general population surveys of New York City conducted 1 to 2 months after September 11, 2001, which showed a prevalence of PTSD of 7.5%–11.2% among New York residents (Galea et al., 2002; Schlenger et al., 2002). PTSD linked to the September 11 terrorist attacks has also been documented in the general U.S. population, although the prevalence in the United States as a whole has been shown to be two to three times lower than it was in New York City in the first months after the September 11 attacks (Schlenger et al., 2002; Silver, Holman, McIntosh, Poulin, & Gil-Rivas, 2002).

Our understanding of the general population consequences of mass traumatic events in general, and of terrorism in particular, however, remains limited. Therefore, in the aftermath of the March 11, 2004, train bombings in Madrid we conducted an assessment of PTSD and depression in the general population that was designed to be comparable to previous assessments in Manhattan and allow comparison across disaster contexts and across countries.

METHOD

Data Collection and Sample

Data were collected through telephone interviews with a random sample of Madrid city residents between April 13 and June 28, 2004, approximately 1 to 3 months after the March 11 attacks. The telephone sample was drawn from a published list of all household telephone numbers in Madrid; it is estimated that 92% of Madrilenos have a home phone and would therefore be eligible for this study (Instituto Nacional de Estadística, 2004). The Ethics Committee of the Faculty of Psychology of the Complutense University of Madrid approved the study, and oral informed consent was obtained.

The sampling frame consisted of adults living in households with telephones in Madrid. We oversampled residents of Madrid who lived within 1 kilometer of the three areas closest to the bombs' explosions. Upon random digit dialing, interviewers screened households for geographic eligibility, and an adult (at least 18 years old) in each household was randomly selected to be interviewed. Ten attempts to contact an adult at each number were made. Overall, 4,107 persons were contacted, and 1,589 interviews were completed, for an effective survey response rate of 38.7% (American Association for Public Opinion Research, 2003).

Instruments. We adapted for this study a survey instrument that has previously been used to document the psychological consequences of the September 11, 2001, terrorist attacks in New York City (Galea et al., 2002). All questions were telephone administered and sequence of key domains was rotated randomly to minimize bias caused by the question sequence. The instrument was modified and adapted to reflect exposure to the March 11 train bombings and included the following question domains: demographics, experiences related to the attack, social

support, perievent panic reactions, lifetime exposure to traumatic events, recent stressors, depression, and posttraumatic stress disorder. Psychometric properties of these question domains have been described elsewhere (Boscarino et al., 2004; Galea et al., 2003). The two key mental health domains of interest were PTSD and depression. We used the National Women's Study (NWS) PTSD module to assess PTSD symptoms since the March 11 bombings (Kilpatrick et al., 1998). The NWS PTSD module is a measure of PTSD that assesses the presence of criterion B (reexperiencing, e.g., intrusive memories, distressing dreams), C (avoidance, e.g., efforts to avoid thoughts associated with the trauma, loss of interest in significant activities), and D (arousal, e.g., difficulty falling asleep or concentrating) symptoms and determines content for content-specific symptoms (e.g., content of dreams or nightmares) if symptom presence is endorsed. Therefore, we were able to assess PTSD that was related to the March 11 bombings on the basis of the presence of at least one reexperiencing symptom specific to the attack, at least three avoidance symptoms (content specific where relevant), and two arousal symptoms. Persons who had one reexperiencing symptom, three avoidance symptoms, and two arousal symptoms but who did not link these symptoms to the March 11 terrorist attacks were considered to have PTSD not linked to the attacks.

Since its implementation, the NWS PTSD scale has been used in a number of large-scale mental health surveys involving over 16,000 completed telephone interviews (Galea et al., 2003; Hanson, Kilpatrick, Freedy, & Saunders, 1995; Kilpatrick, Acierno, Resnick, Saunders, & Best, 1997; Resnick, Kilpatrick, Dansky, Saunders, & Best, 1993). The NWS PTSD module was externally validated in a field trial against the PTSD module of the Structured Clinical Interview for *Diagnostic and Statistical Manual of Mental Disorders*, third edition, revised (*DSM-III-R*) (SCID) administered by mental health professionals (Spitzer, Williams, Gibbon, & First, 1992). In the field trial, instrument sensitivity was 99% and specificity was 79% when compared to SCID diagnosis (Kilpatrick et al., 1998). In addition, this PTSD scale had a reported kappa coefficient with the SCID of .71 for current PTSD

(Kilpatrick et al., 1998; Spitzer et al., 1992). In studies conducted after the September 11 terrorist attacks, alpha coefficient for the NWS PTSD module ranged from .86 to .90. The NWS PTSD module has also been compared to the PTSD Check List (PCL) (Blanchard, Jones-Alexander, Buckley, & Forneris, 1996) among a random subsample of 229 participants in one of our surveys. That comparison found that the PCL had 75% sensitivity and 95% specificity in detecting PTSD cases as classified by our PTSD instrument (Boscarino et al., 2004). In a receiver operating characteristic analysis, against a PCL cutoff score equal to or greater than 50 (the optimal recommended cutoff), the PCL also optimally predicted PTSD using our instrument (area under the curve =.97) (Blanchard et al., 1996). Further details about the NWS PTSD module are available in other publications (Boscarino et al., 2004).

We assessed current (i.e., past 30 days) and lifetime symptoms of depression. For the presence of depression, we used an adapted version of the SCID's major depressive disorder (MDD) interview (Spitzer et al., 1992). The depression scale, which can also be scored continuously, had a Cronbach alpha of .79 in studies conducted after the September 11 terrorist attacks (Boscarino, Galea, Ahern, Resnick, & Vlahov, 2003) and of .85 in the NWS (Kilpatrick et al., 2000). We have previously compared the results for depression in the past 30 days obtained by using our depression scale with those obtained by using the Brief Symptom Inventory 18 (BSI-18) depression scale (Derogatis, 2001). Overall, the BSI-18 depression scale had 73% sensitivity and 87% specificity in detecting depression as classified by our depression instrument (Boscarino et al., 2004). In receiver-operator characteristics analysis, the BSI depression cutoff score of greater than 65, which is the clinical cutoff for BSI depression, also optimally predicted depression when our instrument was used (area under the curve = .89) (Boscarino et al., 2004). We also assessed current (past 30 days) and lifetime depression symptoms. Further details about the depression measure used are available in other publications (Boscarino et al., 2004).

Administering the questionnaire took approximately 30 minutes.

Table 1. Comparison of Survey Sample to Census Demographic Composition of Madrid

	Population (≥18 years old) percentage from 2001 Madrid Census ($N = 2,494,709$)	Sample (≥18 years old) weighted percentage ($N = 1,589$)	Chi square
Gender			0.001
Male	45.9	47.1	
Female	54.1	52.1	
Age			0.036
18–29	21.7	26.3	
30–44	28.7	22.5	
45–59	20.8	25.5	
≥60	28.8	25.6	
Residence by district			0.763
1	4.5	4.0	
2	4.5	4.4	
3	4.2	3.5	
4	4.9	4.4	
5	4.5	4.9	
6	4.8	4.8	
7	5.0	5.4	
8	6.8	6.8	
9	3.7	3.6	
10	8.7	8.3	
11	7.5	6.2	
12	4.0	3.9	
13	7.4	7.6	
14	3.6	4.2	
15	7.5	7.0	
16	4.8	6.0	
17	4.2	4.0	
18	1.9	1.9	
19	1.7	2.8	
20	4.6	5.1	
21	1.2	1.3	

Statistical analysis. Sampling weights were developed and applied to the data to correct for potential selection bias related to the number of household telephones, persons in the household, and oversampling. We report prevalence of lifetime, current (within the past 30 days), March 11–specific, and current non-March 11–specific PTSD and the prevalence of lifetime and current depression. We used 2-tailed chi-square tests to assess the bivariate relations between prevalence of current March 11–related PTSD and of current (within the past 30 days) depression with each of the covariates of interest. Multiple logistic regression was used to examine predictors separately for current PTSD and depression. Differences in log-likelihood were used to determine whether variables were retained in subsequent models. Independent variables were retained in the final model if they were statistically significant at $p \leq .05$.

Results

Sample. We surveyed 1,589 persons overall. Mean age of the sample was 45.5 years ($SE = 0.64$), 52.1% were women (age range 18 to 92 years; mean age $= 46.7$, $SE = 0.79$), and 47.1% were males (age range 18 to 96 years; mean age $= 44.2$, $SE = 1.02$). Table 1 shows age, sex, and residence distributions in our sample compared to the Madrid

Table 2. Comparison of Prevalences of Posttraumatic Stress Disorder and Depression Between March 11, 2004, in Madrid and September 11, 2001, in Manhattan, NY City

	Madrid prevalence % (95% confidence interval)	New York City prevalence % (95% confidence interval)
Posttraumatic		
Ever	12.2% (10.3–14.5)	19.3% (16.6–22.0)
Since events	4.0% (2.9–5.5)	8.9% (7.0–10.8)
Terrorist attacks–related	2.3% (1.6 –3.4)	7.5% (5.7–9.3)
Depression		
Ever	26.8% (24.1–29.6)	27.0% (23.9–30.1)
Since events	8.0% (6.3–10.1)	9.7% (7.6–11.8)
PTSD and depression		
Since events	2.0% (1.2–3.2)	4.4% (3.0–5.8)
Terrorist attacks–related	1.4% (0.8–2.3)	3.7% (2.4–5.0)
PTSD or depression		
Since events	9.5% (7.7–11.6)	14.3% (11.9–16.7)
Terrorist attacks–related	8.4% (6.7–10.5)	13.6% (11.2–16.0)

Note. PTSD = Posttraumatic stress disorder.

2001 Census. There were no statistical differences between our sample and the Madrid 2001 Census.

Prevalence of PTSD and Depression

The prevalence of current PTSD related to the March 11 terrorist attacks in our sample was 2.3% (95% confidence interval = 1.6%–3.4%) (Table 2). We also assessed prevalence of current PTSD that was not related to the March 11 attacks. Of those sampled 1.7% had symptoms consistent with current PTSD not related to the March 11 attacks. Among residents in the areas of oversample, i.e., the areas closer to the train bombings, the prevalence of PTSD was 4.3% (95% *CI* = 2.2–8.3). Lifetime prevalence of PTSD in the overall sample was 12.2% (95% *CI* = 10.3–14.5). The prevalence of current depression was 8.0% (95% *CI* = 6.3%–10.1%), and among residents in the areas of oversample the prevalence of depression was 10.4% (95% *CI* = 6.9–15.3). Lifetime prevalence of depression was 26.8%. Overall, 8.4% (95% *CI* = 6.7–10.5) of the respondents reported either PTSD or depression and 1.4% (95% *CI* = 0.8–2.3) reported symptoms that met criteria for both disorders in our sample (Table 2).

Bivariate Analysis

Table 3 shows the results of bivariate analyses. The covariates associated with PTSD were sex ($p = .001$), age ($p < .05$), level of social support ($p = .001$), number of life stressors in the 12 months before March 11 ($p = .001$), and whether the respondent had a panic attack during or soon after the events ($p = .001$) or directly witnessed the events ($p < .01$).

Covariates associated with depression were sex ($p < .001$), level of social support ($p = .008$), number of life stressors in the 12 months before March 11 ($p < .001$), whether the respondent had a panic attack during or soon after the events ($p < .001$) or directly witnessed the events ($p < .05$), and fear of personal injury or death ($p < .01$).

Multivariate Analysis

In a multivariate logistic regression model (Table 4), significant predictors of PTSD were sex, women as compared with men (odds ratio, 2.6); age, 18 to 29 years old (odds ratio, 9.8), 30 to 44 years old (odds ratio, 9.1), 45 to 59 years old (odds ratio, 7.6), as compared with 60 years old or older; low as compared with high level of social support

Table 3. Bivariate Associations Between Characteristics of the Respondents and Current Posttraumatic Stress Disorder or Depression

Variable	Number of respondents	PTSD (%)	*p* value	Depression (%)	*p* value
Total	1,589	2.3		8.0	
Sex			**		.001**
Male	717	0.9		5.1	
Female	855	3.6		10.6	
Age			*		ns
18–29	342	4.1		11.7	
30–44	437	2.7		6.1	
45–59	365	2.3		7.1	
> 60	427	0.2		7.1	
Social support			**		.008**
High	526	1.7		4.9	
Medium	703	1.6		8.5	
Low	343	5.2		12.6	
Number of life stressors 12 months before March 11, 2004			**		.001**
0	726	0.7		3.9	
1–2	702	2.1		7.3	
3 or more	157	10.4		29.0	
Symptoms of panic attack during or soon after the events			**		**
No	1,403	0.9		6.2	
Yes	186	13.5		23.8	
Directly witnessed the events			**		*
No	1333	2.0		7.5	
Yes, in person	164	8.3		17.2	
Were on a train during the bombings			ns		ns
No	1,532	0.0		7.8	
Yes	17	2.4		17.5	
Friend or relative killed			ns		ns
No	1541	2.2		7.9	
Yes	48	6.1		10.5	
Fear of personal injury or death			ns		**
No	972	1.9		5.8	
Yes	567	2.4		11.8	
Involved in rescue effort			ns		ns
No	1,501	2.3		8.1	
Yes	66	3.6		6.8	
Annual household income			ns		ns
<12,00 €	239	2.8		13.7	
12,001€–24,000€	305	2.8		7.7	
24,001€–36,000€	175	1.7		6.7	
>36,001€	148	2.2		7.0	

Continued

Table 3. *Continued*

Variable	Number of respondents	PTSD (%)	*p* value	Depression (%)	*p* value
Education			*ns*		*ns*
No education	44	0.0		14.6	
6–12 years (elementary)	250	2.8		9.5	
13–16 (junior high school)	179	3.2		7.5	
17–18 (senior high school)	487	2.0		9.7	
19–21 (1st cycle university)	187	2.7		7.0	
21–23 (2nd cycle university)	323	1.5		5.0	
>23 (master's, doctorate)	58	2.0		4.0	
Lived close to the bombings			*ns*		*ns*
No	1,265	2.3		7.9	
Yes	324	4.3		10.4	

*$p < .05.$ **$p < .01.$

(odds ratio, 2.1), one or two (odds ratio, 2.4); and three or more (odds ratio, 7.4) life stressors in the 12 months before March 11 as compared with none; presence of symptoms consistent with a panic attack during or soon after the events as compared with none (odds ratio, 8.2); and direct witnessing of the event (odds ratio, 2.9). The significant predictors of depression were female sex (odds ratio, 1.7); one or two (odds ratio, 1.9) and three or more life stressors (odds ratio, 7.1), as compared with none; symptoms consistent with a panic attack during or soon after the events as compared with none (odds ratio, 3.4); having direct witnessing of the event (odds ratio, 1.7); and fear of personal injury or death during or soon after the events (odds ratio, 2.1).

Discussion

This study used comparable methodology and instruments to those previously employed in Manhattan in the first 1 to 2 months after the September 11, 2001, terrorist attacks (Galea et al., 2002). As such, it provides us with a unique opportunity to compare the prevalence of PTSD and depression in two different populations after different terrorist attacks while minimizing possible differences caused by the study design.

Our survey of the general population of Madrid after the March 11 Madrid train bombings found that only 2.3% of respondents had symptoms consistent with current PTSD related to the March 11 bombings, and another 1.7% of persons had symptoms consistent with PTSD that were not linked to the bombings. After the September 11, 2001, terrorist attacks in Manhattan the prevalence of current PTSD related to the September 11 attacks was substantially higher at 7.5%, although the proportion of persons who had symptoms consistent with current PTSD not related to the terrorist attacks (1.4%) was very similar to the proportion obtained in the Madrid sample. In this study, among residents living in the areas close to the train bombings, the prevalence of PTSD was 4.3%; the comparable prevalence in the area close to the World Trade Center (WTC) after the September 11 terrorist attacks was 20%.

We found that 8.0% of respondents had symptoms consistent with current depression, which was comparable to the 9.7% estimate of current depression among residents of Manhattan after the September 11, 2001, terrorist attacks. In this survey, among those living close to the bombings, the prevalence of depression was 10.4%, which was comparable to 16.8% in the area close to the WTC after the September 11 attacks. Lifetime prevalence of PTSD in our sample was 12.2%, compared to 19.3% in the Manhattan sample after September 11, 2001, suggesting that the primary difference in this lifetime PTSD estimate was the current terrorist-attack-related prevalence of PTSD in the Manhattan sample. Lifetime prevalence of depression was comparable in the Madrid (26.8%) and Manhattan (27.0%) samples.

Table 4. Multivariate Associations Between Characteristics of the Respondents and Current Posttraumatic Stress Disorder or Depression

	PTSD		Depression	
	Odds ratio	95% Confidence interval	Odds ratio	95% Confidence interval
Sex				
Male	1.0		1.0	
Female	2.6	(1.4–4.9)	1.7	(1.1–2.7)
Age				
≥60	1.0			
45–59	7.6	(1.7–33.4)		
30–44	9.1	(2.1–40.2)		
18–29	9.8	(2.3–42.7)		
Social support				
High	1.0		1.0	
Medium	0.8	(0.4–1.6)	1.3	(0.8–2.2)
Low	2.1	(1.1–4.2)	1.8	(1.0–3.2)
Number of life stressors 12 months before March 11,2004				
0	1.0		1.0	
1–2	2.4	(1.1–5.2)	1.9	(1.1–3.1)
3 or more	7.4	(3.3–16.4)	7.1	(4.0–12.8)
Symptoms of panic attack during or soon after the events				
No	1.0		1.0	
Yes	8.2	(4.9 –13.9)	3.4	(2.1–5.4)
Directly witnessed the events				
No	1.0		1.0	
Yes, in person	2.9	(1.5–5.7)	1.7	(1.0–3.0)
Fear of personal injury or death				
No			1.0	
Yes			2.1	(1.4–3.2)

Note. PSTD = posttraumatic stress disorder.

Fundamental differences between the two attacks likely explain these contrasts and provide insight into the cause of PTSD in the general population after mass traumas. Although both attacks were the largest attacks of their kind in both countries, the September 11 attacks resulted in approximately 2,800 fatalities, compared to the 191 fatalities in Madrid. Perhaps as importantly, the September 11 attacks on the WTC were a highly visible terrorist attack; approximately 20% of residents of New York City reported seeing the attacks in person compared to only 6.7% in this study (Galea et al., 2002). Similarly, life in New York City ground to a halt on the day of September 11, 2001, ensuring that all residents of the city were aware of the attacks and their potential consequences. However, the train bombings in Madrid were more circumscribed, and those persons who did not use the trains on a regular basis could go on with their day undisturbed.

This observation, then, argues for the presence of indirect exposure in the aftermath of mass trauma that is associated with the magnitude of the mass trauma and the

extent to which persons in the general population are potentially exposed, albeit indirectly (e.g., through word of mouth, service disruptions, media, fear of subsequent attacks) to the mass traumatic event. Although previous work has suggested that television exposure may contribute to this indirect exposure to a terrorist attack (Ahern et al., 2002), we did not find television watching to be associated with PTSD in this sample. However, again in contrast to the September 11 attacks on the WTC, the March 11 bombings in Madrid made for far less graphic television images (i.e., images of already destroyed trains and persons being rescued compared to live images of airplanes hitting the WTC, people jumping from the towers, and the subsequent collapse of both towers).

There were several important similarities between the findings documented here and those documented after the September 11 attacks. First, the prevalence of current PTSD produced by other causes as well as the prevalence of lifetime PTSD (excepting current terrorism-related PTSD) was comparable in both studies, suggesting few systemic differences between the Madrid and New York City populations. Given the pervasiveness of global trade and cultural norms, the fact that these two populations are quite similar is not surprising and one might then expect that any number of Western cities would be comparable to the cities discussed here.

In addition, strikingly, the prevalences of current and lifetime depression were comparable in the Madrid and Manhattan samples. This study, much as the previous study in Manhattan did, suggests a twofold increase in current depression in the early aftermath of significant terrorist attacks over what might have been expected at baseline in the absence of these attacks (Demytternaere et al., 2004; ES-EMeD/MHEDEA, 2004; Kessler et al., 1994). The observation that the prevalences of depression in Madrid and in Manhattan after the respective terrorist attacks were comparable, in contrast to the differences in current PTSD prevalences discussed previously, suggests that the cause of depression after such terrorist incidents is substantially different from the cause of PTSD. Although depression after disasters is far less commonly studied than is PTSD, mass bereavement may underlie depression after mass traumatic

experiences. Given the dramatic nature of the March 11 bombings and the subsequent political turmoil linked directly to the bombings it is plausible that the bereavement that followed the Madrid bombings was not much different from that which followed the September 11 attacks in contrast to the likely substantial difference in actual direct exposure to the attacks between both incidents.

Multivariable analyses confirm the importance of factors that have previously been shown to be associated with mental health problems after traumatic event experiences. This study confirms the importance of social support, showing that low social support was associated with PTSD and almost reached the level of significance for depression (Norris & Kaniasty, 1996). The role of recent life stressors suggests that persons who experience them are particularly vulnerable to the consequences of terrorism. This group may be particularly important because they are probably readily identifiable in a clinical setting and may benefit from early screening and offers of mental health intervention.

This work confirms earlier findings that perievent emotional reactions may be an important early indicator of subsequent psychopathology after the experience of a mass trauma. Although here we specifically studied symptoms consistent with perievent panic attacks, similar observations have been reported for the experience of peritraumatic dissociation and subsequent risk of development of PTSD (Freedman, Brandes, Peri, & Shalev, 1999). This association of peritraumatic emotional reactions with subsequent psychopathology, consistently with previous work (Galea et al., 2002), has important implications for public health screenings that may identify persons at risk for PTSD or depression early after a terrorist attack. We suggest that this presents a unique opportunity for population-level intervention, possibly based on cognitive-behavior principles, which addresses perievent emotional reactions and minimizes subsequent PTSD and depression (Resnick, Acierno, Holmes, Kilpatrick, & Jager, 1999). For example, early reports suggest that Internet-based cognitive-behavioral interventions that target, among other phenomena, peritraumatic stress reactions have the potential to minimize the longer-term mental health consequences of mass trauma (Ruggiero et al., in press).

There are several considerations important for interpretation of this study. We used telephone interviews to identify cases of PTSD and depression. Although it has been shown that telephone assessment and in-person assessment of Axis I disorders, including anxiety disorders and affective disorders, produce comparable estimates of symptoms (Paulsen, Crowe, Noyes, & Pfohl, 1988), PTSD and depression assessed in this manner cannot be equated to a full diagnosis, and comparisons between the results of this study and other work that uses clinical assessments of psychopathology should be made prudently. Also, the observations drawn here may be biased by survey nonrespondents. The comparability of our sample to expected population demographics and the fact that the response rates obtained in this study are comparable to those in similar work both are reassuring in this regard (Galea et al., 2004; Mariolis, 2001, 2002).

We note that although we collected data on a comprehensive set of potential determinants of psychopathology in the aftermath of a disaster we still did not collect data on some factors that may be important. For example we did not collect information on peritraumatic dissociation, a perievent emotional reaction that has been shown to be predictive of PTSD after traumatic event experiences (Freedman et al., 1999). This lack of data should be considered when drawing inferences about the covariates found to be significant determinants of PTSD or depression in this analysis as in any other analysis that considers determinants of disease within a multivariate framework.

In particular, the variables that were considered in this study are based on a conceptual understanding of the multivariate determinants of the consequences of mass trauma (Freedy, Kilpatrick, & Resnick, 1993). Therefore, the focus on these given variables is not intended to preclude other variables that may be important determinants of mental health after terrorism and the recovery from mental illness after terrorism. For example, recovery from terrorism could be viewed from a coping perspective in which perceived levels of control are important and interact with both peritraumatic responses and other important contextual variables (e.g., life context and environmental resources) not measured here. Also, perceptions of coping efficacy can

determine a sense of perceived control and may provide a mediating factor that predicts PTSD and/or depression (Benight & Bandura, 2004). Future research would do well to consider the full scope of covariates that may determine the consequences of terrorism and the pathways that explicate the relation between these determinants and mental health.

In conclusion, we document differences and similarities between psychopathology in Madrid after the March 11, 2004, train bombings and in Manhattan after the September 11, 2001, terrorist attacks. Taken in concert, these findings suggest that the magnitude of a terrorist attack may be the primary determinant of the prevalence of PTSD in the general population but that other factors may be responsible for determining the population prevalence of depression. Also, a recent history of stressors and peritraumatic emotional reactions may identify persons who are vulnerable to the psychological consequences of terrorism. Persons who have experienced recent stressors may be identified by clinicians, whereas peritraumatic emotional reactions may be the basis of population-level interventions in the aftermath of terrorist attacks.

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