Television Watching and the Risk of Incident Probable Posttraumatic Stress Disorder

A Prospective Evaluation

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Abstract: The relation between viewing television coverage of a mass disaster and the development of posttraumatic stress disorder (PTSD) is poorly understood. A cohort of New Yorkers without baseline probable PTSD ($N = 1787$) was assessed 1 year following the September 11, 2001, attacks. The primary outcome was new-onset probable PTSD assessed through a validated scale, and the primary exposure was number of hours of September 11 anniversary news coverage viewed. A total of 99 (5.6%) of participants had developed probable PTSD at the 1-year follow-up. Watching 12 or more hours of September 11 attack anniversary news coverage was associated with a 3.4-fold increased risk of new-onset probable PTSD ($p = 0.004$). Exposure to television coverage of the September 11 anniversary was associated with new-onset probable PTSD among a cohort of New Yorkers with no probable PTSD at baseline.

Key Words: Disaster, PTSD, television, media.

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Wile several studies have focused on the link between violence on television and aggressive behaviors among children and adolescents (Browne and Hamilton-Giachritsis, 2005; Eron and Huesmann, 1980; Eron et al., 1972, 1974; Huesmann et al., 1983, 2003; Moise and Huesmann, 1996), the relation between the viewing of traumatic events and other psychopathology has received little attention. In particular, the relation between watching traumatic images of real-life events on television and the development of psychopathology has been researched in the postdisaster context but is not well understood (Ahern et al., 2002, 2004; Pfefferbaum

et al., 2001, 2002b). Understanding the impact of televised coverage of disasters, both natural and human-made, may be critical in the development of prevention programs and counseling messages following a mass tragedy.

This issue has been of particular interest in the context of general population exposure to mass traumatic events. Following the bombing of the Alfred P. Murrah Federal Building in Oklahoma City in 1995, several reports showed that exposure to televised images of the events was associated with posttraumatic stress among children (Pfefferbaum et al., 1999, 2000, 2001, 2002a, 2003). In particular, children personally unaffected by the Oklahoma City bombing were shown to be negatively affected by televised images of the tragedy (Pfefferbaum et al., 2003).

In a representative sample of Manhattan residents surveyed shortly after the September 11, 2001, terrorist attacks, repeated viewing of television footage of "people falling or jumping from the towers of the World Trade Center" was associated with posttraumatic stress disorder (PTSD; Ahern et al., 2002). Furthermore, among those directly affected by the September 11, 2001, attacks, repeated viewing of these images was associated with PTSD, while no association existed for those not personally affected (Ahern et al., 2002). In another analysis, those individuals who watched the most television coverage of the September 11 attacks were 66% more likely to have probable PTSD (Ahern et al., 2004) than those who watched minimal television. National samples have also found an association between television viewing of September 11-related coverage and the likelihood of PTSD (Schlenger et al., 2002; Schuster et al., 2001; Silver et al., 2002).

However, all published studies that have assessed the relation between television viewing and psychopathology thus far have had a cross-sectional study design. In this paper, we used a longitudinal cohort study of persons in the general population followed during the first year after the September 11, 2001, terrorist attacks in New York City (NYC) to assess the relation between exposure to television coverage of the anniversary of the September 11, 2001, terrorist attacks and the risk of incident probable PTSD in this population.

METHODS

A random-digit-dial longitudinal telephone survey was conducted, with the baseline interview approximately 6

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months after September 11 (March 25 to June 25, 2002) and the follow-up interview approximately 12 months after September 11 (September 25, 2002 to January 31, 2003). Details of the survey have been described elsewhere (Galea et al., 2003). In short, the sampling frame for the telephone survey consisted of all individuals aged 18 and older who resided in the NYC metropolitan area, which includes NYC as well as Nassau, Westchester, Suffolk, and Rockland counties in New York State; Hudson, Essex, Bergen, Passaic, Union, Middlesex, Monmouth, Morris, and Somerset counties in New Jersey; and Lower Fairfield county in Connecticut. Interviews were conducted in English, Spanish, Mandarin, and Cantonese using translated and back-translated questionnaires and a computer-assisted telephone interview system. Within eligible households, one interviewee was randomly selected by choosing the adult within the household who had most recently celebrated a birthday. Each household was contacted up to 10 times. The response rate among those eligible for the study, which takes into account those contacted but removed for ineligibility, was 56%. Six months after the baseline interview, follow-up interviews were conducted; 71% of the baseline respondents completed the follow-up interview. All participants provided oral consent at the time of interview. This study was approved by the Institutional Review Board of the New York Academy of Medicine.

Participants were asked for demographic information including age, race/ethnicity, sex, education, income, and marital status. We also assessed lifetime traumatic event experience and stressors before September 11. Social support was measured using three questions from the Medical Outcomes Study social support scale (Sherbourne and Stewart, 1991). Additionally, respondents were asked about their personal experiences with respect to the attacks (seeing the attacks in person, having loved ones injured or killed in the attacks, loss of personal possessions or employment as a result of the attacks, and so forth). Exposure to television was assessed at follow-up by asking respondents the amount of September 11-related television they had watched during the 1-year anniversary of the attacks and the total amount of television watched in the week prior to the interview. Exposure to anniversary television viewing related to the September 11 attacks was categorized as low, medium, and high by splitting the distribution of hours watched into thirds.

Probable cases of PTSD at both the baseline and follow-up survey were identified using a modified version of the National Women's Study (NWS) PTSD module (Kilpatrick et al., 1998) based on the DSM-III-R (American Psychiatric Association, 1987). This scale was designed to be implemented in telephone surveys by nonclinicians. The NWS PTSD module is a measure of PTSD that assesses the presence of criterion B, C, and D symptoms and determines content for content-specific symptoms (e.g., content of dreams or nightmares) if symptom presence is endorsed. We assessed probable PTSD that was related to the September 11 attacks based on the presence of necessary PTSD criterion B, C, and D symptoms since September 11. Participants were then required to report at least one re-experiencing symptom specific to the attack, at least three avoidance symptoms

(content specific where relevant or since September 11), and two arousal symptoms (since September 11) for a diagnosis of probable PTSD related to the September 11 attacks since September 11. The Cronbach α for symptoms in the NWS PTSD scale was 0.9 (Boscarino et al., 2002). In a field trial of the PTSD scale against the Structured Clinical Interview for DSM-III-R, the sensitivity of the nonclinician-administered scale was 99% and the specificity was 79% (Kilpatrick et al., 1998). Additionally, our PTSD scale has been implemented in several large-scale telephone surveys (Acierno et al., 2000; Boscarino et al., 2004; Galea et al., 2003; Resnick et al., 1993). When the NWS PTSD scale was validated using the PTSD Check List (Blanchard et al., 1996) as a gold standard, the sensitivity and specificity of our scale were 75% and 95%, respectively (Galea and Vlahov, 2004). PTSD defined through our scale has been shown to be associated with a lower Rosenberg self-esteem score (Blascovich and Tomaka, 1991), a lower mental health score on the Self-Report Scale (Ware and Kosinski, 2002), and lower reported work quality among those employed (Boscarino et al., 2004). Probable PTSD since the September 11 attacks was measured at baseline, and probable PTSD since baseline was measured at follow-up.

To assess incident probable PTSD in the follow-up survey, this analysis was restricted to individuals without a diagnosis of probable PTSD at the baseline interview. Although included respondents could have reported some PTSD symptoms at baseline, they were excluded from this analysis if their reported symptoms met the criteria for a probable PTSD diagnosis. Recognizing that those persons who did not report any posttraumatic stress symptoms at baseline might be different than those who did report some posttraumatic stress symptoms (even if they did not meet criteria for PTSD), we conducted all analyses stratified into two groups—those who reported some baseline symptoms and those who did not. Bivariate associations between characteristics of the respondents and probable PTSD at follow-up were assessed using χ^2 statistics. Furthermore, bivariate analyses were stratified by the presence of probable PTSD symptoms at baseline. Characteristics associated with probable PTSD in the bivariate analysis were considered for inclusion in multivariate logistic regression modeling. All analyses were conducted using SUDAAN (Research Triangle Institute, Research Triangle Park, NC) to correct for the number of telephone lines in a household, the number of adults in a household, oversampling in the baseline survey, and nonresponse bias in the follow-up survey.

RESULTS

A total of 1787 participants were included in this analysis. The age, gender, and racial/ethnic distributions of the sample were comparable both to the 2000 US Census data for the New York metropolitan area and to the baseline sample. In addition, demographic characteristics of those who were included in the follow-up did not differ from the characteristics of those lost to attrition; similarly, there were no differences in the prevalence of psychopathology among those who were and were not successfully followed up. Over

half of the respondents were under the age of 45, and 53% were female. The majority of the sample was white, Asian, or other (64%), with 17% African-American and 20% Hispanic. Nearly all in the sample were high school graduates. Although 42% watched more than 12 hours of television in the week prior to the interview, only 17% watched more than 12 hours of September 11-related anniversary television. Over half of the respondents (56%) watched less than 4 hours of September 11-related television.

Overall, 99 (5.6%) respondents reported symptoms at follow-up consistent with new-onset probable PTSD. Of these, 19 (19%) reported no PTSD-related symptoms at the baseline survey. Eighty (81%) of those with a new-onset probable PTSD had reported at least one symptom consistent with probable PTSD at the time of the baseline survey. In bivariate analysis, watching more hours of September 11-related anniversary television was associated with new-onset probable PTSD ($p < 0.001$), while total hours of television watched in the week prior to the interview was not ($p = 0.18$). New-onset probable PTSD was also significantly associated with being female, being African-American or Hispanic, having an annual income of less than \$30,000, and not having graduated from high school. Lower levels of perceived social support were also associated with new-onset probable PTSD, as were life stressors before and since the September 11 attacks. Individuals who reported having a fear of personal injury or death, panic attacks during and since the September 11 attacks were at increased odds of new-onset probable PTSD. Those who lost possessions or a job as a result of the September 11 attacks were also more likely to have new-onset probable PTSD.

Among those respondents with no symptoms of PTSD at the baseline survey, watching more hours of September 11-related anniversary television was associated with new-onset probable PTSD, although the association was of borderline significance ($p = 0.07$). A lower annual income, a higher number of life stressors, panic attacks during and after the September 11 attacks, losing a job as a result of the September 11 attacks, and unemployment at any time since the baseline interview were associated with an increased risk of new-onset probable PTSD, whereas those who lost a friend or a relative were less likely to have new-onset probable PTSD.

For respondents who reported symptoms but had no diagnosis of probable PTSD at baseline, more hours of exposure to September 11 anniversary television footage was associated with new-onset probable PTSD ($p = 0.001$). Among this group, new-onset probable PTSD was also associated with female gender, African-American or Hispanic race/ethnicity, lower annual income, not having graduated from high school, lower levels of social support, larger numbers of prior and post-September 11 life stressors, fear of personal injury or death, perievent panic attacks, panic attacks since the September 11 attacks, loss of possessions, loss of a job due to the September 11 attacks, and unemployment since the baseline survey.

The final multivariate logistic regression models are shown in Table 1. After adjustment for typical television watching, as well as other covariates significant in the biva-

riate analysis, watching more than 12 hours of September 11 anniversary television coverage was associated with 3.34 times the odds of new-onset probable PTSD as watching less than 4 hours of September 11 anniversary coverage ($p = 0.004$; Figure 1). Other covariates that were associated with new-onset probable PTSD in the adjusted model included an annual income less than \$30,000 (OR = 3.1 vs. annual income of \$30,000 or greater; $p = 0.002$), (OR = 3.5 vs. high; $p = 0.007$) or low (OR = 2.4 vs. high; $p = 0.060$) levels of social support, two or more life stressors since the September 11 attacks (OR = 14.1 vs. no stressors; $p < 0.001$), panic attacks since September 11 (OR = 2.8; $p = 0.005$), loss of possessions (OR = 4.3; $p = 0.033$) and loss of a job as a result of the September 11 attacks (OR = 4.1; $p = 0.014$).

The logistic regression models for those with and without baseline PTSD symptoms but no diagnosis are also shown in Table 1. While there was an association between watching more than 12 hours of September 11 anniversary coverage and PTSD (OR = 8.0; $p = 0.040$), among those without baseline PTSD symptoms, the overall trend was not statistically significant ($p = 0.114$). For those without baseline PTSD symptoms, panic attacks since September 11 (OR = 8.6; $p = 0.006$), loss of possessions (OR = 29.3; $p = 0.003$), and loss of job (OR = 18.3; $p = 0.001$) were all associated with new-onset probable PTSD in the adjusted model. Among respondents who reported baseline PTSD symptoms, 12 or more hours of September 11 anniversary television exposure was associated with new-onset probable PTSD (OR = 3.5; $p = 0.009$), and a dose-response was seen with increasing television exposure ($p = 0.009$). Additionally, in this group of respondents, those reporting an annual income of less than \$30,000 (OR = 4.2 vs. annual income of \$30,000 or higher; $p < 0.001$), two or more life stressors since the September 11 attacks (OR = 20.9 vs. no stressors; $p < 0.001$), and panic attacks since September 11, 2001 (OR = 3.1; $p = 0.004$) were more likely to have new-onset probable PTSD.

DISCUSSION

In a representative sample of residents of the NYC metropolitan area, persons who watched more than 12 hours of anniversary television coverage 1 year after the September 11, 2001, terrorist attacks were more than three times as likely to report symptoms consistent with new-onset PTSD, and there was a dose-response relation between hours of anniversary footage seen and new-onset probable PTSD. This relation was robust to adjustment for typical television viewing and other covariates known to be associated with risk of PTSD.

Our findings of an association between television exposure and incident PTSD are consistent with other studies using cross-sectional samples (Ahern et al., 2002, 2004; Pfefferbaum et al., 2001, 2003; Schuster et al., 2001; Silver et al., 2002). The data presented here suggest that television exposure to a traumatic event may facilitate the development of PTSD, particularly among those who previously reported subthreshold symptomatology. Although this analysis cannot definitively ascertain that increased television watching is

TABLE 1. Multivariate Logistic Regression Models for New-Onset PTSD Among a Sample of New York City Residents

Characteristics	Total Population (N = 1624)		Subset With No Baseline PTSD Symptoms (N = 790)		Subset With Baseline PTSD Symptoms (N = 834)	
	OR	95% CI	OR	95% CI	OR	95% CI
Hours of September 11 anniversary TV coverage watched						
Up to 4 hours	1.00		1.00		1.00	
4–12 Hours	1.48	0.67–3.28	3.76	0.45–31.77	0.79	0.35–1.79
More than 12 hours	3.34	1.48–7.53	8.01	1.10–58.33	3.48	1.37–8.85
Hours of TV watched in past week						
Up to 4 hours	1.00		1.00		1.00	
4–12 Hours	1.05	0.38–2.89	1.16	0.18–7.43	1.05	0.35–3.17
More than 12 hours	1.46	0.63–3.39	0.76	0.12–4.98	1.50	0.58–3.84
Race/ethnicity						
White/Asian/other	1.00		1.00		1.00	
African-American	1.78	0.77–4.13	0.18	0.02–1.47	2.53	1.00–6.41
Hispanic	1.38	0.60–3.16	1.54	0.20–11.70	2.21	0.94–5.22
Income (baseline)						
$30,000+	1.00		1.00		1.00	
<$30,000	3.08	1.54–6.17	2.87	0.42–19.58	4.19	1.99–8.79
Missing	0.67	0.23–1.96	0.56	0.05–6.33	0.70	0.19–2.54
Social support						
High	1.00		1.00		1.00	
Medium	3.53	1.42–8.18	2.85	0.45–17.96	3.58	1.29–9.91
Low	2.38	0.97–5.87	1.23	0.21–7.09	2.64	1.00–7.00
Life stressors 12 months prior to September 11 Attacks						
0	1.00		1.00		1.00	
1	3.23	1.38–7.53	1.04	0.05–23.60	4.01	1.51–10.73
2+	2.28	0.95–5.43	2.87	0.47–17.64	1.44	0.57–3.96
Life stressors since September 11 attacks						
0	1.00		1.00		1.00	
1	3.97	1.42–11.03	0.60	0.05–7.69	7.37	2.64–20.57
2+	14.06	5.05–38.12	14.95	1.67–134.07	20.90	7.10–61.55
Panic attacks since September 11 attacks						
No	1.00		1.00		1.00	
Yes	2.75	1.36–5.56	8.60	1.84–40.19	3.11	1.43–6.75
Lost possessions in September 11 attacks						
No	1.00		1.00		1.00	
Yes	4.29	1.21–16.39	29.30	3.16–271.94	2.53	0.72–8.86
Lost job due to September 11 attacks						
No	1.00		1.00		1.00	
Yes	4.05	1.21–16.39	18.23	3.24–102.51	1.98	0.61–6.45
Unemployed for any time since baseline						
No	1.00		1.00		1.00	
Yes	0.73	0.73–2.95	2.62	0.59–11.69	1.47	0.71–3.06

etiologically relevant to the development of PTSD, it does suggest that further investigation into the relation between television viewing and PTSD is warranted. In the context of mass trauma or disasters that are increasingly subject to widespread, near-constant media exposure and broadcasting of images, this analysis suggests that television viewing may in and of itself represent an "exposure" that may influence risk of psychopathology in the general population.

Although the observation of an association between exposure to traumatic images on television and psychopathol-ogy may be novel, this observation is plausible given the increased television coverage to disasters during the past decade. For example, many more New Yorkers experienced the September 11, 2001, terrorist attacks in real time on television than experienced the attacks in person. An association between television viewing and risk of PTSD would be consistent with the dominant mechanisms that are posited to explain posttraumatic stress symptoms. The viewing of televised images of a disaster may both trigger suppressed traumatic memories (Elliott and Briere, 1995; Kinzie et al.,
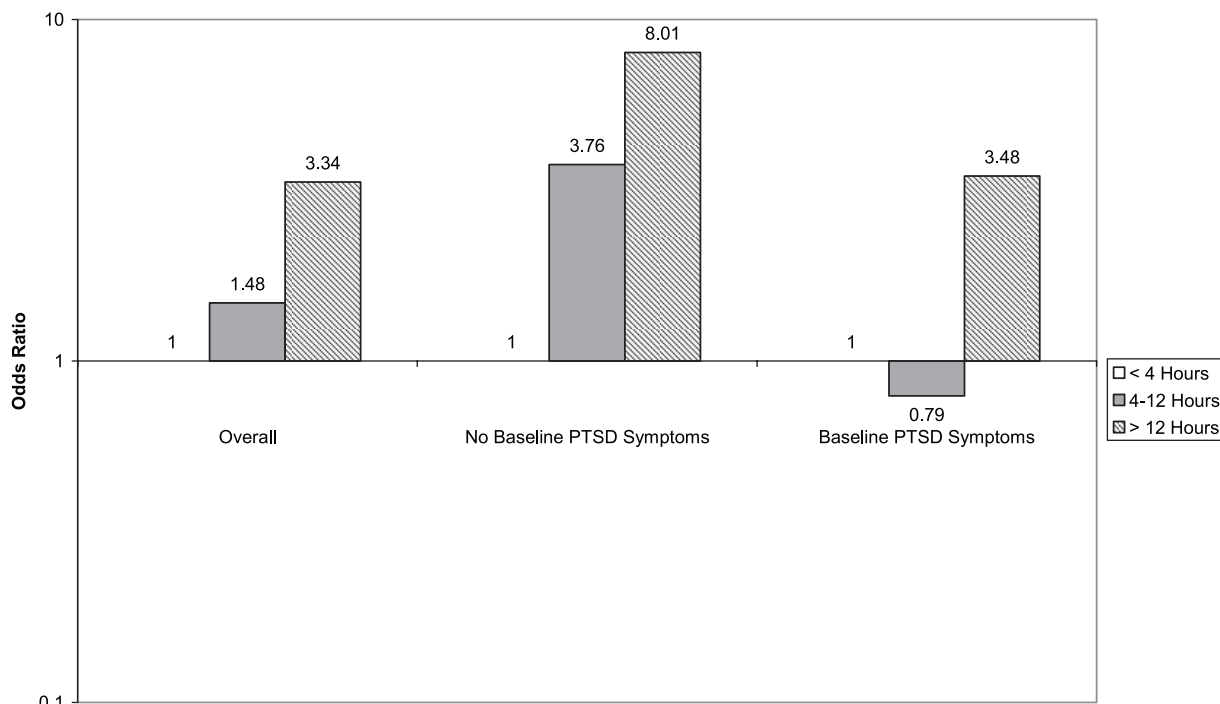
* Adjusted for Total Hours of Television Watched in the Past Week, Race/Ethnicity, Baseline Income, Social Support, Life Stressors Prior to and Since the September 11 Attacks, Panic Attacks Since the September 11 Attacks, Loss of Possessions or Job From September 11 Attacks, and Any Unemployment Since baseline

FIGURE 1. Odds ratios for the relation between hours of WTCD anniversary television viewing and new-onset probable PTSD in an adjusted model.*

1998, 2002; Long et al., 1994) and create new ones (Pfefferbaum et al., 2003; Terr et al., 1999). The demonstration of an association between television images and the risk of PTSD particularly among those who already have subthreshold posttraumatic stress symptoms suggests that reactivation of suppressed memories may here be a particularly important mechanism.

Television as a vehicle for exposure to traumatic events may, at face value, be at odds with generally accepted interpretations of exposure as stated in the DSM-IV (American Psychiatric Association, 1994). The DSM-IV, however, does not explicitly exclude trauma of this nature in its diagnostic criteria for PTSD (American Psychiatric Association, 1994). Others have long addressed the uncertainties of validating psychiatric diagnoses which assumes that "psychiatric disorders are discrete biomedical entities with clear phenotypic boundaries" (Rounsaville et al., 2002, p. 8). Acknowledging this concern, the DSM-IV itself states that diagnostic criteria are "offered as guidelines for making diagnoses, because it has been demonstrated that the use of such criteria enhances agreement among clinicians and investigators" (American Psychiatric Association, 1994, p. xxxii). Importantly, we note if televised coverage of a disaster is truly associated with an increased risk of PTSD independent of other exposures, the scope of persons exposed to disasters will increase dramatically beyond the population of people directly exposed. Clearly, there is a need to address this issue further in longitudinal studies specifically designed for this purpose.

Overall, 1.7% ($N = 19$) of the respondents in this study developed new-onset probable PTSD related to the September 11 terrorist attacks nearly 1 year after the September 11 attacks after having no baseline symptoms. These data suggest that delayed-onset PTSD is possible, and furthermore, that anniversary coverage of the September 11 terrorist attacks may have contributed to this PTSD. The notion of delayed-onset PTSD has been controversial. Some reports suggest that delayed-onset PTSD does not exist (North et al., 1999) or is purely a function of misclassified reporting of symptoms following a traumatic event (North et al., 1997; Weisaeth, 1989). However, others (Ehlers et al., 1998; Gray et al., 2004; Wolfe et al., 1999) have suggested that PTSD can develop some time after exposure to a traumatic event. The prospective design of the study allows us to shed further light on this issue. At the very least, the demonstration of sufficient posttraumatic stress symptoms to meet PTSD criteria in a small subset of persons who previously did not report any symptoms suggests that development of symptomology a year after experiencing the trauma is possible and merits further attention. While a relatively small percentage of participants in this analysis developed probable new-onset PTSD, in a large metropolitan area such as NYC, this may represent tens of thousands of people. Therefore, the provision of mental health services should be considered not only for the time immediately following a disaster, but for a period postevent. In the postdisaster period, communication regarding the development of PTSD and referrals to mental health services may be a productive and cost-effective intervention.

The analysis presented here has several limitations. While those who were unable to be interviewed at follow-up did have similar demographics from those completing the interview, the potential for selection bias exists. If persons more or less likely to have new-onset PTSD were more likely to be lost to follow-up, the measures of effect presented here may be biased. However, nearly three fourths (71%) of the baseline sample completed a follow-up interview, and we have no reason to believe that differential loss to follow-up existed. Probable PTSD was determined through phone interview. Although the scales used in this study were validated, new-onset probable PTSD does not represent a full diagnosis of PTSD. The primary exposure examined here was hours of September 11 anniversary-related television watched. Recall bias could possibly explain our findings. Those who had new-onset probable PTSD may have been better at recalling their viewing of the precipitating traumatic event, since re-experiencing is part of the diagnostic criteria for PTSD (American Psychiatric Association, 1987). This phenomenon has been reported elsewhere (Breslau et al., 1997; Cottencin et al., 2005; Ehlers et al., 2004; Golier et al., 2003). Finally, although this is a prospective analysis and the PTSD is incident, we are not able to determine whether viewing September 11 anniversary coverage preceded the development of probable new-onset PTSD. This analysis identified individuals who developed probable new-onset PTSD in the time period following the baseline interview, yet at what point these symptoms began is unknown. There was no association between television viewing and resolution of PTSD symptoms among those with early-onset PTSD symptoms (data not shown), providing some reassurance in this regard.

We have shown that watching televised coverage of the first anniversary of September 11 attacks was associated with an increased likelihood of new-onset probable PTSD among those without a baseline PTSD diagnosis. These results are consistent with findings from previous cross-sectional studies (Ahern et al., 2002, 2004; Silver et al., 2002; Stein et al., 2004) and suggest that television coverage of traumatic events may play a role in the development of PTSD. Both the International Society for Traumatic Stress Studies (http://www.istss.org/terrorism/news_consumption.htm) and the National Center for PTSD (http://www.ncptsd.va.gov/facts/disasters/fs_media_disaster.html) recommend the avoidance or limitation of repeated media coverage of the events for those who have experienced trauma. While determining the exact role (if any) television may play in the etiology of PTSD requires further research, reduction of exposure to televised coverage of traumatic events may contribute to lower prevalence of psychopathology in the general population following mass trauma.

REFERENCES

Acierno R, Kilpatrick DG, Resnick H, Saunders B, De Arellano M, Best C (2000) Assault, PTSD, family substance use and depression as risk factors for cigarette use in youth: Findings from the National Survey of Adolescents. *J Trauma Stress*. 13:381–396.

Ahern J, Galea S, Resnick H, Kilpatrick D, Bucuvalas M, Gold J, Vlahov D (2002) Television images and psychological symptoms after the September 11 terrorist attacks. *Psychiatry*. 65:289–300.

Ahern J, Galea S, Resnick H, Vlahov D (2004) Television images and probable posttraumatic stress disorder after September 11: The role of background characteristics, event exposures, and perievent panic. *J Nerv Ment Dis*. 192:217–226.

American Psychiatric Association (1987) *Diagnostic and Statistical Manual of Mental Disorders* (3rd, revised ed). Washington (DC): American Pscyhiatric Association.

American Psychiatric Association (1994) *Diagnostic and Statistical Manual of Mental Disorders*. Washington (DC): American Psychiatric Association.

Blanchard EB, Jones-Alexander J, Buckley TC, Forneris CA (1996) Psychometric properties of the PTSD Checklist (PCL). *Behav Res Ther*. 34:669–673.

Blascovich J, Tomaka J (1991) Measure of self-esteem. In JP Robinson, PR Shaver, LS Wrightsman (Eds), *Measures of Personality and Social Psychological Attitudes*. New York: Academic Press.

Boscarino JA, Galea S, Adams RE, Ahern J, Resnick H, Vlahov D (2004) Mental health service and medication use in New York City after the September 11, 2001, terrorist attack. *Psychiatr Serv*. 55:274–283.

Boscarino JA, Galea S, Ahern J, Resnick H, Vlahov D (2002) Utilization of mental health services following the September 11th terrorist attacks in Manhattan, New York City. *Int J Emerg Ment Health*. 4:143–155.

Breslau N, Davis GC, Andreski P, Peterson EL, Schultz LR (1997) Sex differences in posttraumatic stress disorder. *Arch Gen Psychiatry*. 54:1044–1048.

Browne KD, Hamilton-Giachritsis C (2005) The influence of violent media on children and adolescents: A public-health approach. *Lancet*. 365:702–710.

Cottencin O, Vaiva G, Huron C, Devos P, Ducrocp F, Jouvent R, Goudemand M, Thomas P (2006) Directed forgetting in PTSD: A comparative study versus normal controls. *J Psychiatr Res*. 40:70–80.

Ehlers A, Hackmann A, Michael T (2004) Intrusive re-experiencing in post-traumatic stress disorder: Phenomenology, theory and therapy. *Memory*. 12:403–415.

Ehlers A, Mayou RA, Bryant B (1998) Psychological predictors of chronic posttraumatic stress disorder after motor vehicle accidents. *J Abnorm Psychol*. 107:508–519.

Elliott DM, Briere J (1995) Posttraumatic stress associated with delayed recall of sexual abuse: A general population study. *J Trauma Stress*. 8:629–647.

Eron LD, Huesmann LR (1980) Adolescent aggression and television. *Ann N Y Acad Sci*. 347:319–331.

Eron LD, Huesmann LR, Lefkowitz MM, Walder LO (1972) Does television violence cause aggression? *Am Psychol*. 27:253–263.

Eron LD, Huesmann LR, Lefkowitz MM, Walder LO (1974) How learning conditions in early childhood——including mass media—relate to aggression in late adolescence. *Am J Orthopsychiatry*. 44:412–423.

Galea S, Vlahov D (2004) Mental health in the New York City metropolitan area after the September 11 attacks: Research of the New York Academy of Medicine. In T Smith (Ed), *The Social, Psychological and Political Impact of the September 11 Terrorists Attacks on the American Public*. New York: Russell Sage.

Galea S, Vlahov D, Resnick H, Ahern J, Susser E, Gold J, Bucuvalas M, Kilpatrick D (2003) Trends of probable post-traumatic stress disorder in New York City after the September 11 terrorist attacks. *Am J Epidemiol*. 158:514–524.

Golier JA, Yehuda R, Lupien SJ, Harvey PD (2003) Memory for trauma-related information in Holocaust survivors with PTSD. *Psychiatry Res*. 121:133–143.

Gray MJ, Bolton EE, Litz BT (2004) A longitudinal analysis of PTSD symptom course: Delayed-onset PTSD in Somalia peacekeepers. *J Consult Clin Psychol*. 72:909–913.

Huesmann LR, Eron LD, Klein R, Brice P, Fischer P (1983) Mitigating the imitation of aggressive behaviors by changing children's attitudes about media violence. *J Pers Soc Psychol*. 44:899–910.

Huesmann LR, Moise-Titus J, Podolski CL, Eron LD (2003) Longitudinal relations between children's exposure to TV violence and their aggressive and violent behavior in young adulthood: 1977–1992. *Dev Psychol*. 39:201–221.

Kilpatrick D, Resnick H, Freedy J, Pelcovitz D, Resnick P, Ruth S (1998) The posttraumatic stress disorder field trial: Evaluation of the PTSD

construct-criteria A through E. In T Widiger, A Frances, H Pincus, et al. (Eds), *DSM-IV Sourcebook* (pp 803–844). Washington (DC): American Psychiatric Association.

Kinzie JD, Boehnlein JK, Riley C, Sparr L (2002) The effects of September 11 on traumatized refugees: Reactivation of posttraumatic stress disorder. *J Nerv Ment Dis*. 190:437–441.

Kinzie JD, Denney D, Riley C, Boehnlein J, MacFarland B, Leung P (1998) A cross-cultural study of reactivation of posttraumatic stress disorder symptoms: American and Cambodian psychophysiological response to viewing traumatic video scenes. *J Nerv Ment Dis*. 186:670–676.

Long N, Chamberlain K, Vincent C (1994) Effect of the Gulf War on reactivation of adverse combat-related memories in Vietnam veterans. *J Clin Psychol*. 50:138–144.

Moise JF, Huesmann LR (1996) Television violence viewing and aggression in females. *Ann N Y Acad Sci*. 794:380–383.

North CS, Nixon SJ, Shariat S, Mallonee S, McMillen JC, Spitznagel EL, Smith EM (1999) Psychiatric disorders among survivors of the Oklahoma City bombing. *JAMA*. 282:755–762.

North CS, Smith EM, Spitznagel EL (1997) One-year follow-up of survivors of a mass shooting. *Am J Psychiatry*. 154:1696–1702.

Pfefferbaum B, Doughty DE, Reddy C, Patel N, Gurwitch RH, Nixon SJ, Tivis RD (2002a) Exposure and peritraumatic response as predictors of posttraumatic stress in children following the 1995 Oklahoma City bombing. *J Urban Health*. 79:354–363.

Pfefferbaum B, Moore VL, McDonald NB, Maynard BT, Gurwitch RH, Nixon SJ (1999) The role of exposure in posttraumatic stress in youths following the 1995 bombing. *J Okla State Med Assoc*. 92:164–167.

Pfefferbaum B, Nixon SJ, Tivis RD, Doughty DE, Pynoos RS, Gurwitch RH, Foy DW (2001) Television exposure in children after a terrorist incident. *Psychiatry*. 64:202–211.

Pfefferbaum B, Pfefferbaum RL, North CS, Neas BR (2002b) Does television viewing satisfy criteria for exposure in posttraumatic stress disorder? *Psychiatry*. 65:306–309.

Pfefferbaum B, Seale TW, Brandt EN Jr, Pfefferbaum RL, Doughty DE, Rainwater SM (2003) Media exposure in children one hundred miles from a terrorist bombing. *Ann Clin Psychiatry*. 15:1–8.

Pfefferbaum B, Seale TW, McDonald NB, Brandt EN Jr, Rainwater SM, Maynard BT, Meierhoefer B, Miller PD (2000) Posttraumatic stress two years after the Oklahoma City bombing in youths geographically distant from the explosion. *Psychiatry*. 63:358–370.

Resnick HS, Kilpatrick DG, Dansky BS, Saunders BE, Best CL (1993) Prevalence of civilian trauma and posttraumatic stress disorder in a representative national sample of women. *J Consult Clin Psychol*. 61: 984–991.

Rounsaville B, Alarcon R, Andrews G, Jackson JS, Kendell RE, Kendler K (2002) Basic nomenclature issues for DSM-V. In D Kupfer, M First, D Reiger (Eds), *A Research Agenda for DSM-V* (pp 1–29). Washington (DC): American Psychiatric Association.

Schlenger WE, Caddell JM, Ebert L, Jordan BK, Rourke KM, Wilson D, Thalji L, Dennis JM, Fairbank JA, Kulka RA (2002) Psychological reactions to terrorist attacks: Findings from the National Study of Americans' Reactions to September 11. *JAMA*. 288:581–588.

Schuster MA, Stein BD, Jaycox L, Collins RL, Marshall GN, Elliott MN, Zhou AJ, Kanouse DE, Morrison JL, Berry SH (2001) A national survey of stress reactions after the September 11, 2001, terrorist attacks. *N Engl J Med*. 345:1507–1512.

Sherbourne CD, Stewart AL (1991) The MOS social support survey. *Soc Sci Med*. 32:705–714.

Silver RC, Holman EA, McIntosh DN, Poulin M, Gil_rivas V (2002) Nationwide longitudinal study of psychological responses to September 11. *JAMA*. 288:1235–1244.

Stein BD, Elliott MN, Jaycox LH, Collins RL, Berry SH, Klein DJ, Schuster MA (2004) A national longitudinal study of the psychological consequences of the September 11, 2001 terrorist attacks: Reactions, impairment and help-seeking. *Psychiatry*. 67:105–117.

Terr LC, Bloch DA, Michel BA, Shi H, Reinhardt JA, Metayer S (1999) Children's symptoms in the wake of Challenger: A field study of distant-traumatic effects and an outline of related conditions. *Am J Psychiatry*. 156:1536–1544.

Ware JE, Kosinski M (2002) *Version 2 of the SF-12 Health Survey.* Boston: Quality Mertics, Inc.

Weisaeth L (1989) The stressors and the post-traumatic stress syndrome after an industrial disaster. *Acta Psychiatr Scand Suppl*. 355:25–37.

Wolfe J, Erickson DJ, Sharkansky EJ, King DW, King LA (1999) Course and predictors of posttraumatic stress disorder among Gulf War veterans: a prospective analysis. *J Consult Clin Psychol*. 67:520–8.