Stress-Related Changes in Toddlers and Their Mothers Following the Attack of September 11

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Unlike other forms of disaster, terrorism is not confined to a particular place or time, and recent evidence indicates that the 9/11 terrorist attack was a significant macrolevel stressor affecting the health and mental health of United States citizens. No studies, however, have reported symptoms in toddlers and their mothers both before and after the attacks. To address this gap, we examined the effects of the 9/11 terrorist attacks on mothers and their 33-month-old toddlers. The attacks occurred during data collection at 33 months of a longitudinal study. Thirty-three-month-old toddlers and mothers who were assessed after the attacks were compared with those assessed before the attacks. When changes were examined from a previous wave of data collected at 15 months, those in the after-attack group showed poorer health, lower child acceptance, and marginally more anxiety, and their toddlers cried more and slept less, whereas the before-attack group showed no changes. Our findings contribute to research documenting widespread effects of the 9/11 terrorist attack on stress-related symptoms and suggest that greater attention must be placed on the needs of our youngest citizens and their caregivers.
Lambert, Baron, McPherson, & Lee, 2002; Shedd et al., 2004), and acute stress reactions to 9/11 were associated with a 53% increase in cardiovascular ailments in a national study 3 years later (Holman et al., 2008). Mental health was also affected. For example, 52% felt depressed, 62% had trouble sleeping, 66% had trouble concentrating, and 50% felt that their safety and security had been shaken (Institute for Social Research, 2001). Even 600 miles away from the site of the attacks in Ann Arbor, Michigan, there was a significant increase in psychiatric disorders and a 49% increase in suicide attempts after 9/11 compared with before 9/11, with effects remaining for 2 years (Starkman, 2006). In the month after the attack, depressive symptoms rose nationally (Knudsen, Roman, Johnson, & Ducharme, 2005), and symptoms of anxiety, posttraumatic stress disorder (PTSD), and alcohol consumption increased in the Midwest in the months after 9/11, with effects remaining 4 years later (Richman et al., 2008). Women were particularly vulnerable, with those experiencing chronic work stress demonstrating increased psychological distress, anxiety, and alcohol use after 9/11 (Richman, Wislar, Flaherty, Fendrich, & Rospenda, 2010). In sum, a significant body of literature has demonstrated widespread stress, health, and mental health effects of the attack of 9/11 and the continued threat of terrorism.

One group that was particularly affected was mothers. Single mothers living with children were more likely to feel threatened, and parents were more shaken by the attacks and remained disturbed for at least 1 year compared with other adults (Institute for Social Research, 2002; Phillips, Prince, & Schiebelhut, 2004). Likewise, the stress reactions of mothers in Seattle, Washington, were associated with higher levels of school children’s posttraumatic stress symptoms, whereas maternal acceptance (vs. rejection) of children predicted lower levels of posttraumatic stress symptoms (Wilson, Lengua, Meltzoff, & Smith, 2010). Consistent with the ecological-transactional model of community violence (Lynch & Cicchetti, 1993) and consistent relations between parent and child trauma-related symptoms (Scheeringa & Zeanah, 2001), the 9/11 attack and threat of terrorism were associated with parenting stress, which, in turn, was associated with children’s distress.

Although less attention has been given to effects on children than adults, evidence indicates that, nationwide, 35% of children between the ages of 5 and 18 had at least one of five trauma-related stress symptoms (Schuster et al., 2001) with 50% maintaining symptoms for 1–2 months (Stein et al., 2004). Retrospective accounts indicate that over 70% of school-age children within 100 miles of the attacks reported experiencing at least one symptom of PTSD such as intrusive thoughts, poor concentration, hyperarousal, and sleep problems (Aber, Hoven, & Kotler, 2003; Phillips et al., 2004). Twelve percent had probable separation anxiety, and 28% had evidence of anxiety or depressive disorders (Hoven et al., 2004, 2005). Supporting findings of clinically significant sleep problems in adults under high terrorist threat (Palmieri, Chipman, Canetti, Johnson, & Hobfoll, 2010), increased difficulties with sleep were also evident after 9/11, with youth significantly more likely to report being worried at bedtime than before 9/11, and preschoolers exposed to high-intensity World Trade Center attacks were at increased risk of sleep problems (Chemtob, Nomura, & Abrahmovitz, 2008; Mijanovich & Weitzman, 2010; Nomura & Chemtob, 2009).

One important gap in the literature, however, is that, despite the widespread attention on older children and adults, almost no research has explored the effects of 9/11 on toddlers and their parents using longitudinal or quasiexperimental designs. Numerous clinical reports and retrospective accounts indicate that children 5 years old and younger were affected by the tragedy, based on parents’ retrospective interviews suggesting high levels of stress symptoms in children 5 years old and younger (DeVoe, Bannon, & Klein, 2006). Indeed, parent interviews 9–12 months postdisaster by DeVoe et al. (2006) revealed that children in New York City had new fears (52%), more aggression (23%), sleep problems (43%), clinging behavior (44%), and upset during parental separation (33%). Likewise, preschoolers exposed to high-intensity World Trade Center attacks demonstrated (a) increased risk of sleep problems, anxiety, or depression; (b) clinically significant emotionally reactive, anxious, or depressed, and sleep problems if they also had been exposed to prior trauma; and (c) emotionally reactive and aggressive behavior problems if their mothers evidenced depression or PTSD (Chemtob et al., 2008, 2010; Nomura & Chemtob, 2009). However, given that these studies were based exclusively on retrospective reports of their children’s behavior following the attack of 9/11, the extent to which these symptoms reflect changes from preexisting levels following the attack cannot be determined. It is possible that these children may have demonstrated emotional distress and sleep difficulties even before the attack occurred. Therefore, without information on preexisting levels of symptoms, the extent to which the attack of 9/11 altered symptoms in toddlers and their mothers is not clear.

Research on the impact of war, terrorism, and various types of disasters is often limited methodologically because of an inability to use standard experimental designs (North & Pfefferbaum, 2002). Because of the unpredictable nature of these traumatic events, researchers rarely have preexisting symptom levels of their participants. In addition, the frequent use of retrospective reports compared with prospective data is also problematic. This study seeks to overcome these limitations using a quasiexperimental design to examine changes in health, mental health, and symptoms of emotional distress in mothers and their toddlers before and after the attacks of September 11. To date, no studies have compared preexisting and postattack symptoms in toddlers following the attack and, given relations between sleep difficulties and both terrorist threat and parenting stress and health (Lavie, 2001; Melzer & Mindell, 2007; Palmieri et al., 2010), these may include difficulty sleeping and emotional distress such as crying (Scheeringa & Gaensbauer, 2000; Scheeringa, Zeanah, Drell, & Larrieu, 1995).

**Research Issues**

Our study adds to the growing literature on the effects of disaster and terrorism on children and mothers’ functioning in several ways. Whereas much of the existing literature has examined the effects of disaster and terrorism on older children and adults, this work examined the effects of terrorism on toddlers and their mothers. We assessed these effects on several stress-
related symptoms that have been found to be associated with disaster. These include changes in crying, sleeping, anxiety, depression, and parenting stress.

This research is also unique for its inclusion of baseline levels of symptoms, which is very rare in studies of disaster and terrorism. Because disastrous and terrorist events are often unpredictable, most studies of stress-related symptoms are based on retrospective reports. Consequently, few studies are able to account for preexisting symptom levels and rule out the possibility that symptom levels existed prior to the event. Our natural, quasiexperimental design provided a unique opportunity to examine whether stress-related symptom levels in 33-month-old toddlers and their mothers increased after the 9/11 attack and ensuing terrorist threat, compared with their levels at 15 months.

As we were conducting our 33-month assessments of our longitudinal study (McDonough, 1994), the attacks of 9/11 occurred. This historical event created a naturalistic design in which we had a group of toddlers and their mothers who had their 33-month assessment before the attacks and another group who had their 33-month assessment as the study continued after the attacks. All assessments after 9/11 were conducted within 3 months following the attacks and during the period of highest terrorist threat and four nationwide terror alerts. Using this quasiexperimental design, we compared 33-month-old toddlers and their mothers who were assessed before the attacks occurred with those assessed after the attacks occurred. Capitalizing upon existing baseline data, we controlled for levels of stress-related symptoms that toddlers and their mothers had at a prior 15-month assessment.

Based on the stress paradigm linking psychosocial stressors to health and mental health (Dohrenwend & Dohrenwend, 1974; Link & Phelan, 1995), as applied to macrolevel stress of the 9/11 terrorist attack and ensuing threats (Richman et al., 2008), we hypothesized that, controlling for 15-month levels, mothers and toddlers who had their 33-month assessment after 9/11 would have higher levels of stress-related symptoms compared with those who had their follow-up assessment before 9/11. Our main questions were as follows: Compared with their levels at 15 months, do 33-month-old toddlers who were assessed after the 9/11 attack evidence more crying and less sleeping than those who were assessed before the 9/11 attack? Compared with their levels at 15 months, do mothers of 33-month-old toddlers who were assessed after the 9/11 attack evidence more anxiety, depression, health problems, and parenting stress than those who were assessed before the 9/11 attack?

Method

Participants

An ongoing longitudinal study provided us with the unique opportunity to examine the effects of the 9/11 attack with existing baseline data. Specifically, data are from a longitudinal study of the development of self-regulation in a sample of children during the first 3 years of life and their families, living in the Midwest, several hundred miles from the events of September 11. The Michigan Family Study (McDonough, 1994), begun in the late 1990s, collected data on the participants’ history of mental health symptomatology, parenting, and family and environmental risks when the children were 7, 15, and 33 months of age. The entire sample had completed the 15-month assessment, and most families had completed the 33-month assessments before September 11, 2001. The 33-month sample includes dyads that were assessed before or after the attacks of 9/11. A smaller group that completed the assessments after 9/11 permitted us to examine the effects of the terrorist act and threat of terrorism. Indeed, the existence of before-attack (BA) and after-attack (AA) subgroups and preexisting levels of all study variables allowed for a rare quasiexperimental test of the impact of terrorism on mental health symptoms in families with young children.

Two hundred and fifty-two infants (54% females) were enrolled at 7 months of age (Table 1). Of these, 221 children and mothers were assessed at 15 months (six relocated, 25 declined), and 191 children were assessed at 33 months (11 relocated, 19 declined)—169 before and 22 after 9/11. Of the original sample, 55% of the infants were female, and 45% were male. Seventy-five percent were Euro-Americans, 13% African American, 1% Latino, 7% biracial, and 3.6% were classified as “Other.” Average age for mothers was 29 years (range 16–43). Ninety-six percent of mothers had at least a high school degree or GED; 92% were married or living with a partner. The median annual family income at both ages was between $50,000 and $55,000. Multivariate analysis of variance (MANOVA) comparing maternal age, years of education, and family income between the participants and nonparticipants and chi-square analyses on remaining categorical variables were not significant, suggesting attrition was random. Likewise, no significant differences were found on 15-month (Time 1) measures of toddler and maternal stress-related symptoms. Demographic characteristics were also compared for the BA and AA groups at 33 months, and both groups were equivalent on all demographic and dependent variables at 15 months.

Table 1. Sample Demographics (n = 194)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average maternal age (years)</td>
<td>31 (range 17–44)</td>
</tr>
<tr>
<td>Average paternal age (years)</td>
<td>32 (range 20–54)</td>
</tr>
<tr>
<td>Median income</td>
<td>$50,000–$55,000</td>
</tr>
<tr>
<td>Percentages</td>
<td></td>
</tr>
<tr>
<td>Maternal education</td>
<td></td>
</tr>
<tr>
<td>High school/GED or above</td>
<td>90%</td>
</tr>
<tr>
<td>Paternal education</td>
<td></td>
</tr>
<tr>
<td>High school/GED or above</td>
<td>100%</td>
</tr>
<tr>
<td>Maternal marital status</td>
<td></td>
</tr>
<tr>
<td>Married/living with partner</td>
<td>91%</td>
</tr>
<tr>
<td>Child sex (male)</td>
<td>43%</td>
</tr>
<tr>
<td>No siblings/1–2 siblings</td>
<td>55%, 45%</td>
</tr>
<tr>
<td>Child race</td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>8.50%</td>
</tr>
<tr>
<td>Asian American</td>
<td>3.50%</td>
</tr>
<tr>
<td>European American</td>
<td>80%</td>
</tr>
<tr>
<td>Latino</td>
<td>1%</td>
</tr>
<tr>
<td>Biracial</td>
<td>7%</td>
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information during an interview. Following the interview, the mothers completed a packet of questionnaires. Mothers rated parenting stress and emotional distress or mental health. Toddler’s crying and sleeping behavior was reported at 15 and 33 months.

**Measures—15 and 33 Months**

**Maternal anxiety.** Mothers reported their levels of anxiety using the 20-item Spielberger State Anxiety Scale (STAI; Spielberger, 1983). The degree to which a statement applied to the mother was rated with a 4-point scale from 1 (never) to 4 (always). Examples include “I feel anxious.” Cronbach’s alphas for the scale at 15 and 33 months were 0.92 and 0.91, respectively.

**Maternal depression symptomatology.** Mothers reported their levels of depressive symptomatology using the Center for Epidemiological Studies of Depression Scale (CES-D; Radloff, 1977). Items were rated on a 4-point Likert scale, 0 (<1 day per week) to 3 (5–7 days per week). Examples include “felt depressed” and “talked less than usual.” Total scores were summed and reflected the level of depressive symptomatology. Cronbach’s alphas for the scale at 15 and 33 months were 0.89 and 0.91, respectively.

**Child crying.** Mothers reported their perceptions of their child’s crying patterns using the Cry Patterns Questionnaire (CPQ; St. James-Roberts & Halil, 1991). Maternal estimates of morning, afternoon, evening, and night crying were obtained, and the 24-hr total was calculated.

**Child sleep.** Mothers reported their child’s sleeping patterns using the Sleep Habits Questionnaire (Owens, Spirito, & McGuinn, 2000; Seifer, Sameroff, Dickstein, & Hayden, 1996). Children’s 24-hr sleep total was calculated.

**Parenting stress.** Mothers reported their parenting stress using subscales from the Parenting Stress Inventory (PSI; Abidin, 1986). Twenty-six items were included that measure parenting stress in the child domain (those characteristics of the child that make parenting difficult) and the parent domain (those characteristics or roles in the parenting relationship that can make parenting difficult). Specifically, we included three subscales: Acceptability, Competence and Health Problems. Most items were rated on a 5-point Likert scale, 1 (strongly agree) to 5 (strongly disagree), and four were rated on a 4-point scale. Cronbach’s standardized alphas for the subscales ranged from 0.72 to 0.78.

**Results**

**Analytic Strategy**

To examine group differences across time in symptomatology, 2 × 2 (Group × Time) multivariate repeated measures analyses of variance were conducted using dependent variables grouped by (a) maternal and child emotional stress symptoms and (b) parenting stress and health. Because of the use of an unbalanced design, we used general linear models for all analyses and report Pillai’s Trace statistics. Next, 2 × 2 (Group × Time) univariate analyses of variance and post hoc comparisons were conducted for each of the dependent variables. Specifically, the behaviors at 15 months were compared with behaviors at 33 months. Then, comparisons were made between the BA and AA subgroups. To correct for sphericity common in repeated measures analysis, the Greenhouse–Geisser correction was used (Greenhouse & Geisser, 1959). The Bonferroni correction was used to test all post hoc comparisons.

**Emotional Stress Symptoms**

Results of the Group × Time multivariate repeated measures analysis of variance using the four emotional stress-related dependent variables yielded a nonsignificant main effect for group, but a significant effects for time, Pillai’s Trace, F(4, 171) = 14.09, p < .01, and a Group × Time interaction, Pillia’s Trace, F(4, 171) = 3.25, p < .01.

Follow-up univariate repeated-measures analysis of variance was conducted for each dependent variable (see Table 2). No main effects of group were revealed. For crying, significant effects were noted for time, F(1, 174) = 9.79, p < .01, and a Group × Time interaction, F(1, 174) = 5.99, p < .01. For sleep, significant effects were revealed for time, F(1, 174) = 46.87, p < .01, but this was subsumed under a Group × Time interaction, F(1, 174) = 5.74, p < .01. There was also a marginal Group × Time interaction for maternal anxiety, F(1, 174) = 2.65, p = .10. The post hoc tests revealed differences in the expected direction. Compared with the BA group, the AA group of 33-month-old toddlers engaged in significantly more crying (p < .01) and less sleeping (p < .01) at 33 months than they did at 15 months (see Figures 1 and 2). Moreover, the mothers in the AA group reported marginally more anxiety at 33 months than the BA group (p = .10).

**Parenting Stress and Health**

Results of the Group × Time multivariate repeated measures analysis of variance using the three parenting stress-related dependent variables yielded a nonsignificant main effect for group, but significant effects for time, Pillai’s Trace, F(3, 185) = 3.61, p < .01, and marginally significant Group × Time interaction, Pillai’s Trace F(3, 185) = 2.44, p < .06.

Follow-up univariate repeated-measures analysis of variance was conducted for each dependent variable (see Table 3). No main effects of group were noted. However, for parenting competence stress, significant main effects were noted for time, F(1, 187) = 5.56, p < .01, with more parenting competence stress at 33 versus 15 months (Bonferroni, p < .01). For difficulties with acceptance of child, there was a significant main effect for time, F(1, 187) = 8.88, p < .01, with more difficulties at 33 versus 15 months (Bonferroni, p < .01), but this was subsumed under a significant Group × Time interaction, F(1, 187) = 3.83, p < .05. Likewise, for health difficulties, there were significant Group × Time interactions, F(1, 187) = 5.16, p < .05. Follow-up post hoc analyses using Bonferroni comparisons revealed that compared with BA mothers, AA
mothers reported significantly more health difficulties and greater difficulties accepting their child than they did at 15 months (see Figures 3 and 4).

### Discussion

Based on the macrolevel stress paradigm (Dohrenwend & Dohrenwend, 1974; Link & Phelan, 1995; Richman et al., 2008), we predicted that mothers and toddlers exposed to the 9/11 terrorist attack and the ensuing national threats of terrorism 3 months following the attack would demonstrate changes in stress-related symptoms compared with before the attack. Data from two assessment waves supported our hypothesis and documented increases in the stress-related symptoms of AA mothers and toddlers compared with BA mothers and toddlers.

To date, little research has examined the impact of 9/11 and the threat of terrorist attacks on toddlers. Perhaps, widespread beliefs exist that toddlers are too young to understand and consequently be impacted by terrorism and terrorist threat. However, our data support numerous observations by clinicians and demonstrate that children as young as 2 years of age are affected by tragedies such as that of 9/11 and ongoing terrorist threat (Gurwitch, Sitterle, Young, & Pfefferbaum, 2002).

Consistent with the growing body of research demonstrating both short- and long-term effects of the 9/11 terrorist attack and terrorist threat throughout the nation and abroad, our data support numerous observations by clinicians and demonstrate that children as young as 2 years of age are affected by tragedies such as that of 9/11 and ongoing terrorist threat (Gurwitch, Sitterle, Young, & Pfefferbaum, 2002).

Given that both terrorist attacks and terrorist threats have been demonstrated to elicit stress-related symptoms and difficulties...
in adults across the nation, the changes documented in this study may have developed because of the ensuing terrorist attack and distant trauma. The study may have developed because of the ensuing terrorist attacks and distant trauma, and the changes documented in this study may have developed because of the ensuing terrorist attack and the macrostressor of terrorism.

Difficulties with acceptance of child by 9/11 group and time (means and standard errors). BA = Before attack group; AA = After attack group.

Figure 3. Maternal health difficulties by 9/11 group and time (means and standard errors). BA = Before attack group; AA = After attack group.

Our findings demonstrate that it not only affects adults and adolescents (Costello, Erkanli, Keeler, & Angold, 2004), but can also impact toddlers. Our findings also indicate that mothers of young children were also affected by the attack. Not only were marginal changes in anxiety observed (which may have been significant with a larger sample size and greater statistical power), but the event also appeared to reduce mothers’ health and acceptance of their child. In contrast to other studies (Knudsen et al., 2005), increases in depressive symptoms were not observed. In sum, results from this study demonstrate that the attack of 9/11 resulted in increased health difficulties in mothers, lower acceptance of their child, and increased levels of crying and decreased levels of sleep in their toddlers. This combination of effects underscores the importance of examining the impact of national disasters and terrorism and terrorist attacks, specifically.

Strengths of the current study are the use of a quasieperimental, longitudinal design consisting of baseline levels of stress-related symptomatology and the use of a control group, which is rare in studies of large-scale terrorism and terrorist threat. Likewise, all assessments following 9/11 were conducted 3 months following the terrorist attack, within the period of highest terrorist threat and four nationwide terror alerts.

Nevertheless, a number of limitations warrant caution in interpretation of the results. The first pertains to omitted variable bias. It is possible that the changes in symptom levels following 9/11 may be because of other unmeasured variables such as perceptions of possible risks to financial or job security. Second, caution must be taken in inferring causality. Although this study addressed limitations in prior research by capitalizing on a unique opportunity to use a prospective, longitudinal, quasieperimental design to control for baseline symptoms levels, the quasieperimental nature of the design precludes our ability to make definitive causal statements.

Likewise, the use of parent report measures of child outcomes, which is necessary at this age group, may reflect rater bias and may be associated with inflation of child symptoms. Although a number of studies have reported that, in comparison with children’s self-reports, parents underestimate the impact and severity of trauma on children (Scheeringa & Zeanah, 2008), it is possible that, rather than inflating children’s ratings of symptomatology, parents in this study may have underestimated the impact and severity of terrorism and terrorist threat on their toddlers. Nevertheless, inclusion of observational, physiological, and fine-grained assessments of total 24-hr toddler sleeping and crying behavior would decrease the possibility of rater bias.

Likewise, the study is limited by the small number of participants that were assessed after 9/11. The unequal sample size and, specifically, the small size of one of our comparison groups is a limitation of our study. Following Peterson’s (2007) methodological and statistical guidelines and recommendations for best practices using small samples in quantitative research, we situate our rationale for the use of our small sample within the paucity of literature and knowledge pertaining to the effects of 9/11, other terrorist attacks, and ongoing terrorist threat on mothers and toddlers (while controlling for preexisting symp-
Given the tragic and unpredictable nature of disaster and international terrorism, one does not know when such a horrible historical event will occur and, in the case of terrorism, this often leads to a prolonged period of heightened threat and vigilance throughout the nation and abroad. Consequently, research on disaster and “the ethical and practical dilemmas ... represent rare data obtained by methods that may not meet typical standards of scientific rigor and the value is generally based upon the judgment of potential value and unique contribution ... in the context of current knowledge” (Masten & Osofsky, 2010, p. 1029). Yet, the findings from our study are important, given that no studies have been published documenting the effects of 9/11 and international terrorism on toddlers and their families that control for preexisting, baseline, individual differences. To date, we know very little about the effects on toddlers and their parents, given the challenges inherent in disaster research. The few reported findings that exist are based on retrospective reports, and our study provides a contribution to expand our current knowledge about the effects of terrorism and terrorist threat on toddlers and their mothers geographically distant from the site of attack. Our study provides a unique opportunity to address this gap and further our understanding of these effects on young children. Nevertheless, the results of this study should be interpreted within the context of a small comparison group and as the first study to examine these effects in young children while controlling for preexisting levels.

Many studies examining geographically distant sites involve nationally representative samples, and others reflect samples limited to regions such as the Midwest (e.g., Chicago, Michigan, etc.). Comparable to our study, Starkman (2006) assessed individuals residing within Ann Arbor, Michigan, which is over 600 miles from the site of the attack, and reported significantly higher levels of suicide attempts following 9/11 compared with before 9/11. Likewise, our study demonstrated significant increases in stress-related symptoms in mothers and their toddlers who were also in Michigan, geographically distant from the site of the attacks. Although our findings contribute to existing work in this area, it is also important to recognize that our findings may not generalize to individuals across the United States.

Finally, given that this analysis was based on an ongoing longitudinal study developed prior to the tragedy, we did not have measures of the 9/11 attack in terms of exposure to the attack, media coverage, relations to victims, perceived threat, and prior trauma, which have all been documented to significantly increase stress-related responses to validate proximal exposure (Hoven, Duarte, & Mandell, 2003; Pefferbaum, et al., 2003a,b,c). Nevertheless, without measures of those additive effects and validation of proximal exposure, we demonstrated significant changes from baseline symptomatology within the first 2 months following the terrorist attack. Studies assessing the additive effects of direct exposure and their associations with symptom changes are urgently needed to inform the postdisaster environment and public health agenda.

Nevertheless, the goal of terrorism is to inflict widespread fear among members of an identified group, and, consequently, the effects of terrorism may have no geographical bounds and extend beyond proximal locations. Indeed, a growing body of research has demonstrated that terrorism and ongoing terrorist threat have a significant impact on individuals geographically distant and hundreds of miles away from the site of an attack. Widespread stress-related changes have also been observed across populations in London, England, Israel, and the United States with minimal exposure (Marshall et al., 2007). Therefore, direct exposure and proximity to a terrorist attack may not be the only avenue for the development of stress-related symptoms compared with other disasters, particularly given the widespread possibility of unpredictable attacks. Therefore, unlike disasters with geographically specific boundaries, research on the effects of terrorism and ongoing terrorist threat should be broadened to consider the effects on individuals with low levels of proximity and exposure to a terrorist attack, yet who experience ongoing terrorist threats, and the processes through which these may occur. This may enhance our understanding of unique and specific effects of terrorism compared with other disasters and may contribute to a greater appreciation of the potentially widespread effects and needs following national and international effects of terrorism, particularly among vulnerable groups, and which may currently be underappreciated.

In sum, the findings from the study suggest that children as young as 33 months of age and their mothers experienced significant stress-related changes following the terrorist attacks and during heightened terrorist threat following 9/11. Furthermore, these effects were observed for mothers and toddlers who were several hundred miles from the site of the attacks. Therefore, these findings contribute to the growing body of literature on the unique and widespread population level effects of terrorist disasters. We can no longer assume that only those directly exposed to terrorism are adversely affected (Gurwitch et al., 2002), and the unique, widespread effects of terrorist threat suggest the importance of coordinated, widespread national attention and efforts. Researchers and clinicians should consider the reactions of toddlers and their parents in daily settings such as daycare centers, hospitals, and community shelters. Early detection of adverse acute reactions and timely interventions are critical to facilitating recovery in the postattack, ongoing terrorist threat environment, particularly as it may reduce risk of parenting stress, harsh parenting, and child abuse, heightened under conditions of pediatric excessive crying and sleep difficulties (Reijneveld, van der Wal, Brugman, Hira Sing, & Verloove-Vanhorick, 2004).

Clinical Implications

These findings suggest that greater attention must be placed on the effects of terrorist attacks, threat, and other forms of disasters on our youngest citizens across the nation. These effects provide support for the impact of macrolevel stressors such as terrorism and threat on population level health and mental health changes. Likewise, consistent with prior research, the effects of stress on children may have occurred indirectly
through transactional processes involving parental reactions. Therefore, assessments of the potentially unique impact of terrorist attack and threat must be conducted on a widespread level and for toddlers and caregivers. Numerous studies have documented that parental reactions to disaster and accompanying disaster-related challenges are significant predictors of children’s distress and should be targeted for intervention (Green et al., 1991). Thorough assessment of the functioning of the parent and the child should be considered (Zeanah, Larrieu, Heller, & Valliere, 2000), and interaction guidance and multi-systemic approaches may prove useful in addressing the parenting relationship (McDonough, 2004).

Keywords: toddlers; mothers of toddlers; terrorism; terrorist threat; terrorist attack; posttraumatic stress; child trauma symptoms; proximity to terrorist attack; September 11

References