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Ethnicity and Gender in the Face of a Terrorist Attack: A National Longitudinal Study of
Immediate Responses and Outcomes Two Years after September 11

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Abstract

This study examined ethnic and gender differences in open-ended immediate responses to an online prompt provided by a nationwide sample of 1,559 individuals in the days following the September 11th terrorist attacks. These responses were used to predict longitudinal outcomes over the following 2 years. Results showed that African Americans and women responded with more emotions (e.g., sadness, sympathy) than Whites and men. African Americans and women also endorsed violent retaliation less often than their counterparts. Responding with sadness and sympathy and endorsing violent retaliation were, in turn, associated with higher distress and posttraumatic stress (PTS) symptoms over time. Results reveal considerable ethnic and gender differences in immediate responses to traumatic events that have long-term mental health consequences.

Ethnicity and Gender in the Face of a Terrorist Attack: A National Longitudinal Study of
Immediate Responses and Outcomes Two Years after September 11

The devastating terrorist attacks of September 11, 2001, exposed the entire nation to a collective trauma of unprecedented magnitude. Widespread media and press coverage turned the psychological impact of the localized attacks into a global issue that rippled beyond the immediately affected communities. In fact, even those who were not directly exposed to the attacks displayed post-traumatic stress (PTS) symptoms and were vulnerable to both short- and longer-term distress as well (Schlenger et al., 2002; Schuster et al., 2001; Silver, Holman, McIntosh, Poulin, & Gil-Rivas, 2002). Because of its expansive nature, this event offered a unique opportunity to assess ethnic and gender differences in immediate responses to a trauma nationwide, as well as examine the relationship between immediate responses and health outcomes over time.

Recent research has identified demographic variables such as gender and ethnicity as predictors of response to events such as terrorism (Walker & Chestnut, 2003); however, extensions of these findings are plagued by limited and localized samples and cross-sectional and retrospective data collection. Few studies sample from both genders and a range of ethnic groups across an entire nation because typical examinations of coping with trauma deal with situation-specific (e.g., loss of a loved one, illnesses), as opposed to collective, stressful events. This creates difficulties in making generalizations and comparisons beyond the scope of the personal traumas of specifically affected populations (Silver, 2004a; Wadsworth et al., 2004). In addition, research on ethnic differences in emotional reactions is usually cross-cultural; within-country ethnic examinations are sparse in comparison (Matusumoto, 1993).

Ethnic Differences in Response to Traumatic Events

Past reports have shown that African Americans generally emote more than White

Americans because it is more widely accepted and valued in their culture (Dixon, 1976; White & Parham, 1990). Specifically for Black Americans, higher levels of anger in the face of adversity have been linked to increased risk of health complications (Barnes, Treiber, & Ludwig, 2003; Johnson & Broman, 1987). Generally, this group is at increased risk for stress-related health problems (Mayet et al., 1997; Osei & Schuster, 1994). Studies following the 9/11 attacks have repeatedly found that African Americans and Hispanics report more trauma-related symptoms than Whites (Galea et al., 2002; Schlenger et al., 2002; Schuster et al., 2001; Weissman et al., 2005). African Americans are also more likely than Whites to employ problem-focused coping by making behavioral changes targeted at their future security (e.g., improving home security, limiting outside activity) and turning to religion (Torabi & Seo, 2004).

Gender Differences in Response to Traumatic Events

Past studies have yielded disparities in how men and women differ in their responses to stressful events. In both the empirical literature and popular culture, women are more emotional and less stoic than men (Grossman & Wood, 1993). Men respond with less sadness to stressful situations than women, but studies on the expression of anger have yielded inconsistent results (Grossman & Wood, 1993). Research following September 11th has confirmed previous findings: women responded more emotionally and reported greater distress than men (Schuster et al., 2001; Walker & Chestnut, 2003). In addition to engaging in more emotion-focused activities (e.g., journal writing, therapy), women also sought more social activities (e.g., talking to people, attending church) than men (Wadsworth et al., 2004). Generally, men employ more problem-solving and avoidant-focused coping in stressful situations than women (Tamres, Janicki, & Helgeson, 2002). In general, research has also consistently found that women suffer greater PTS symptoms than men (Chen et al., 2001; Galea et al., 2002; North et al., 1999; Schlenger et al., 2002; Silver et al., 2002).

In fact, Pulcino and colleagues (2003) found that women were twice as likely as men to report PTS symptoms 1 to 2 months post-9/11.

When considering both of these demographic variables together, the pattern is consistent with a previously documented phenomenon in which Whites and men stand apart in their response to trauma, whereas women and ethnic minorities are more similar (Flynn, Slovic, & Mertz, 1994). Research indicates that Whites and men perceive their levels of risk and vulnerability as low when compared to other ethnicities and women, respectively, due to sociopolitical factors acting in their favor (Finucane, Slovic, Mertz, Flynn, & Satterfield, 2000; Satterfield, Mertz, & Slovic, 2004). Women and ethnic minorities' risk judgments have been linked to the fact that they perceive themselves as more vulnerable and as victims of social injustices (Satterfield et al., 2004).

Immediate Responses and Long Term Outcomes Following Traumatic Events

There is a paucity of research on immediate responses to trauma and their effects over time due to the multitude of methodological challenges involved with quick-response data collection (e.g., securing funding and obtaining a sound sample from the traumatized population; see Silver, 2004a). Most studies have relied on retrospective self-report designs that are prone to recall bias and memory distortions (Stone, Turkkan, Bachrach, Jobe, Kurtzman, & Cain, 2000). The evidence that does exist suggests that the frequency and range of emotional reactions following a disaster varies greatly (North et al., 1999); however, understanding of specifics is limited (Silver et al., 2002). Immediately disengaging (e.g., giving up) from coping efforts to the 9/11 attacks increased the likelihood of ongoing distress and PTS symptoms (Silver et al., 2002). In contrast, problem solving as a coping technique shortly after a traumatic event has been linked to more favorable outcomes (Blake, Cook, & Keane, 1992; Solomon, Mikulincer, & Avitzur, 1988). Although the majority of affected individuals do not develop long-term depression or posttraumatic stress disorder (PTSD),

they do temporarily display greater immediate negative affect (Cohn, Mehl, & Pennebaker, 2004; Stroebe, Hansson, Stroebe, & Schut, 2001). Immediate PTS symptoms in Gulf War veterans have also been indicative of health complications 2 years post-trauma (Wagner, Wolfe, Rotnitsky, Proctor, & Erickson, 2000). There is remaining debate on how long the health complications last; some reports show a decline within 6 months post-9/11 (Galea et al., 2003), whereas others report effects enduring up to 2 years post-9/11 (Brackbill et al., 2006; Grieger, Waldrep, Lovasz, & Ursano, 2005; Weissman et al., 2005). Existing research on the health impact of 9/11 is also limited by non-representative samples (Galea et al., 2002), cross-sectional designs (Schlenger et al., 2002; Torabi & Seo, 2004), and retrospective reporting (Grieger et al., 2005).

Study Overview

The present study utilized immediate and long-term post-trauma assessments from a large and diverse national sample to explore gender and ethnic differences in response to the terrorist attacks of September 11, 2001. Specifically, we coded unstructured, open-ended responses from a national sample following an offer to share anonymously one's reactions to the events of 9/11 within days of the attacks. Then, the results of this coding were used to predict longitudinal outcomes assessed over the following 2 years. We examined (a) the relationships between ethnicity and gender and immediate responses expressing emotion and endorsing future action (e.g., retaliation, changing government policy), and (b) the relationships between these immediate responses and generalized distress, PTS symptoms, and physician-diagnosed health problems over time. We hypothesized that Non-White ethnicities and women would display a greater number of emotional responses and Non-White ethnicities and men would be more likely to endorse future action following the event. We also predicted that Non-White ethnicities and women would have worse longitudinal outcomes. Furthermore, we expected that expressing emotions immediately

following the attacks would be associated with greater long-term distress. Although we did not make a directional prediction, we also examined the relationship between endorsing action and subsequent outcomes. Because concerns about security and preventing additional attacks should be related to advocating future actions aimed at addressing threats, it is important to understand the possible consequences of such viewpoints.

Methods

Data Collection With a Web-Enabled Panel

The study sample, provided by Knowledge Networks Inc. (KN), an online survey research company, was drawn from a nationally representative web-enabled panel that was created through traditional probability methods. Panel members are recruited by stratified random-digit telephone dialing, ensuring an equal probability of selection for every U.S. household with a telephone. To ensure representation of population segments that would not otherwise have Internet access, KN provides panel households with an Internet connection and appliance that uses the television as a monitor (Web TV). In exchange, panel members agree to complete 3-4 short surveys a month sent through their password-protected email addresses. Responding to any given survey is voluntary, and surveys are self-administered and accessible at any time of the day for a designated period of time. Each survey can only be completed once, and the agreement for Internet service is not dependent on completion of any specific survey. Even though panel members complete surveys regularly, there are no significant differences over time in responses given by “seasoned” participants from “naïve” ones (Dennis, 2001).

Demographic variables are assessed for all individuals when they enroll in the KN panel, including sex, age, marital status, race/ethnicity, education, and income. Upon entry into the KN panel and *prior* to 9/11/01, respondents also completed a survey of their mental and physical health

history that assessed whether a physician had ever diagnosed them with 30 physical and mental health problems including depression or anxiety disorder.

Open-Ended Prompt and Current Sample

On September 11, 2001, KN emailed its panelists the following open-ended prompt: “If you would like, please share your thoughts on the shocking events of today.” Panel members were allowed to provide open-ended responses until September 21, 2001. Approximately 36,000 panel members were available to receive surveys at that time; of these, 19,593 opened the e-mail containing the prompt and 13,958 responded.

In the years following the 9/11 attacks, our research team conducted a longitudinal data collection documenting post-trauma responses with a nationally representative sample of the adult US population selected from the KN panel (see Silver, Holman, McIntosh, Poulin, Gil-Rivas, & Pizarro, 2006, for more details). A subset of 1,559 of the respondents our in longitudinal study also received and responded to the open-ended prompt immediately after 9/11. Nearly half of this subsample responded to the prompt by the end of September 12, 2001 ($n = 712$), with more than 78% responding within the first four days ($n = 1,227$). This paper reports the findings of this subsample over time.

Coding

After developing an initial coding scheme, two raters (TQC and WAE) coded sub-samples of open-ended responses from members of the broader KN web panel who did not participate in the longitudinal research project. When sufficient inter-rater reliability (kappas $> .70$) was attained, the raters applied the refined coding scheme to the 1,559 open-ended responses from the primary study sample (kappas $> .90$), resolving remaining disagreements through discussion with a third judge (MDS).

The present investigation focused on elements of two coding categories: expressed emotions and endorsement of action to be taken in the future. For the emotion category, raters marked each coding element as present or absent for each participant's response, such that a given participant's response could have been rated as including multiple coded emotions. Responses were coded for explicit mention of the following emotions or their synonyms: anger, sadness, and sympathy directed towards victims. For the action category, responses were coded for endorsement of the following actions at some point in the future: explicitly "violent retaliation," "other reprisal" that did not explicitly mention violence but was still directed towards the people responsible for the attack, and "action directed elsewhere" (e.g., change government policies). Unlike with the coded emotions, there were few cases ($n = 36$) in which participants endorsed multiple categories of actions. Thus, at the cost of losing a minimal amount of information, the action categories were coded as mutually exclusive to allow for more sensitive analyses. We deemed *a priori* that the predictors and consequences of endorsing violence vs. not were of greatest interest, followed by reprisal that did not include violence, and finally other actions. Coding priority was assigned in this order, such that a response that endorsed both violent retaliation and other action was coded as violent retaliation only.

Longitudinal Outcomes

Participants completed longitudinal assessments at five additional points in time: 2 months, 6 months, 12 months, 18 months, and 24 months post-attacks. These assessments were administered online by KN or, for participants who had withdrawn from the KN panel, via independent on-line or paper-and-pencil follow-up. Participants completed measures of generalized distress, PTS symptoms, and health ailments. Generalized distress was assessed using the Brief Symptom Inventory (BSI-18; Derogatis, 2001) at 6, 12, 18, and 24 months post-attacks. PTS symptoms were

assessed using the Impact of Event Scale-Revised (IES-R; Weiss & Marmar, 1997) at 2 and 6 months post-attacks and the PTSD Checklist (Weathers, Litz, Herman, Huska, & Keane, 1993) at 12, 18 and 24 months post-attacks. Health ailments were assessed at 12 and 24 months post-attacks by asking participants whether a physician had ever diagnosed them with any of a list of physical disorders using the identical measure that had been completed by the sample prior to 9/11/01.

Analytical Strategy

Covariates. The inherently unpredictable nature of terrorist attacks made it impossible to collect pre-trauma baseline measurements of the longitudinal mental health outcome scales. However, using the pre-9/11 survey of health history, an index of physician-diagnosed mental health problems with values of 0 (no diagnoses) or 1 (depression, anxiety or both) was created. This pre-9/11 mental health index served as a control in all analyses as a proxy for pre-9/11 mental health. A count of pre-9/11 physician diagnosed physical health difficulties also served as a control for pre-9/11 health in all analyses. In addition, all analyses also controlled for the following covariates: demographic characteristics (age, income, marital status, and level of education) and length of the written open-ended response in characters (thus accounting for the possibility that longer responses were more likely than shorter ones to incorporate any given coding category simply by expressing a larger number of ideas).

Immediate responses. Dependent variables included the following: whether or not respondents expressed anger, sadness, or sympathy; and whether they endorsed explicitly violent retaliation, other reprisal that did not explicitly mention violence but was still directed towards the people responsible for the attack, and action directed elsewhere. Logistic regression analyses were performed using gender and ethnicity simultaneously to predict coded categories from the open-ended responses. These and all other inferential analyses were conducted on STATA for Macintosh

(version 8.2), specifying the robust option.

Longitudinal outcomes. Dependent variables included the following: generalized distress (BSI-18 at 6, 12, 18, and 24 months post-attacks), PTS symptoms (IES-R at 2 and 6 months post-attacks; PCL at 12, 18, and 24 months post-attacks), and number of physician-diagnosed health ailments 12 and 24 months post-attacks. Dependent variables were analyzed with Generalized Estimating Equations (GEE), an analysis appropriate for longitudinal survey data, which uses population-averaged models that accommodate missing assessments and provides necessary adjustments of standard errors. The analysis combines assessment points for a given dependent variable, yielding a single significance test for each predictor across all assessments.

In the first set of analyses, after adjusting for all covariates, gender and ethnicity were entered simultaneously to predict longitudinal outcomes. In the second set, the coded emotions were added individually in separate analyses to assess their relationships with dependent variables, above and beyond the effects of gender and ethnicity. In the third set, the coded endorsements of action were added to gender and ethnicity as predictors. Because the action categories were mutually exclusive, they were combined into a single variable with four levels (i.e., the three categories plus no endorsement of action), allowing between-category comparisons.

Transformations. The following dependent variables and covariates were highly positively skewed, so inverse or natural logarithmic transformations were performed as appropriate: generalized distress, PTS symptoms, length of the written open-ended response in characters, and pre-9/11 number of physician-diagnosed health ailments.

Results

Demographic Characteristics of the Sample

Table 1 presents the breakdown of demographic characteristics for respondents who both

viewed the immediate post 9/11 open-ended prompt and participated in our subsequent longitudinal assessments over the next two years ($n = 1,559$). An additional set of individuals who participated in our longitudinal data collection also received and opened the immediate post 9/11 prompt but chose not to respond ($n = 579$). When demographic characteristics were simultaneously used to predict whether individuals in our longitudinal study chose to respond to the open-ended prompt or not, only age was significant, such that older individuals were more likely to respond to the prompt immediately after 9/11 (adjusted odds ratio [AOR] = 1.02, 95% CI = 1.01-1.02, $p < .001$).

Using demographic characteristics to predict failures to respond to the dependent variables of interest over the combined five waves of subsequent surveys revealed that the following people were more likely to miss assessments: younger individuals (AOR = 0.98, 95% CI = 0.98-0.99, $p < .001$); individuals with less than a high school degree, relative to those with more education (AORs = 1.24-1.49, $ps < .05$); women (AOR = 1.13, 95% CI = 1.02-1.26, $p < .05$); and African Americans, relative to all other ethnic groups (AORs = 1.22-1.33, $ps < .06$). However, we successfully maintained a substantial portion of the eligible adult sample at each wave (ranging from a 70% - 91% participation rate at each follow-up), and in general the sample remained representative of the US adult population over time (see Silver et al., 2006).

- Insert Table 1 about here -

Ethnicity and Gender as Predictors of Immediate Responses

Table 2 presents descriptive results of the open-ended coding. For ease of presentation, findings for ethnicity and gender are discussed separately.

- Insert Table 2 about here -

Ethnicity. As shown in Table 3, African Americans were over twice as likely to respond with any emotion as Non-Hispanic Whites (hereafter referred to as Whites). “Other” ethnicities, a

group consisting primarily of Asian Americans, were marginally more likely than Whites to respond emotionally ($p = .066$). Regarding specific emotions, African Americans were marginally more likely than Whites to express sympathy for the victims (AOR = 1.57, 95% CI = 0.99-2.51, $p = .055$) and significantly more likely to express sadness (AOR = 1.70, 95% CI = 1.10-2.62, $p < .05$). Regarding responses endorsing future actions, “Other” ethnicities were less likely than Whites to endorse taking any action (Table 3), including other reprisal (AOR = 0.54, 95% CI = 0.27-1.08, $p = .082$). African Americans were less likely than Whites to endorse explicitly violent retaliation (AOR = 0.13, 95% CI = 0.03-0.55, $p < .01$).

- Insert Table 3 about here -

Gender. Women were over twice as likely as men to respond with any emotion (see Table 3). Regarding specific emotions, women were marginally less likely than men to respond with anger (AOR = 0.69, 95% CI = 0.47-1.07, $p = .055$), and women were more likely than men to respond with sympathy for the victims (AOR = 2.07, 95% CI = 1.58-2.71, $p < .001$) and express sadness due to the events (AOR = 1.85, 95% CI = 1.39-2.46, $p < .001$). Regarding responses endorsing future actions, women were less likely than men to endorse taking any action (Table 3), including other reprisal (AOR = 0.63, 95% CI = 0.47-0.85, $p < .01$). Women were also less likely than men to endorse explicitly violent retaliation (AOR = 0.38, 95% CI = 0.26-0.58, $p < .001$).

When predicting immediate responses, none of the two-way interactions between gender and ethnicity were significant. However, for violent retaliation, the interaction term representing African American women could not be tested because none endorsed this option.

Predictors of Longitudinal Outcomes

Ethnicity. Hispanics reported higher generalized distress than Whites and higher levels of PTS symptoms from 12 to 24 months post-9/11 than Whites (see Table 4). There were no

significant longitudinal effects for African American and “Other” ethnicities when compared to Whites.

- Insert Table 4 about here -

Gender. As shown in Table 4, Women reported higher generalized distress than men and higher levels of PTS symptoms from 2 to 24 months post-9/11 than men. Women were also diagnosed with more health ailments than men.

When predicting longitudinal outcomes, the only significant two-way interaction between gender and ethnicity was for number of physician-diagnosed ailments, such that Hispanic men had marginally fewer than White men ($p = .053$), whereas Hispanic women had significantly more than White women ($p = .01$).

Expressing emotion. Specific early emotional reactions to the events of September 11th were associated with more negative outcomes over time (see Table 4). Respondents who expressed sadness reported higher PTS symptoms from 2 to 6 months post-9/11. Individuals who expressed sympathy suffered marginally higher PTS symptoms from 12 to 24 months post-9/11 ($p = .054$). There were no significant effects for expressing anger.

Endorsing action. Table 4 reports results from two different analyses for the endorsing action categories. The first uses violent retaliation as the reference group, while the second compares other forms of action against taking no action at all. As shown in the Table, individuals who endorsed explicitly violent retaliation immediately after the 9/11 attacks suffered relatively worse outcomes: greater generalized distress than those who endorsed other reprisal, action directed elsewhere, or no action; and higher PTS symptoms from 2 to 6 months post-9/11 than those who suggested action directed elsewhere. Respondents who did not endorse any action also suffered relatively worse outcomes: higher PTS symptoms from 2 to 24 months post-9/11 than those who

endorsed action directed elsewhere; and higher PTS symptoms from 12 to 24 months post-9/11 than those who endorsed other reprisal.

Discussion

The present investigation adds to existing literature on ethnic and gender differences in emotional responses, coping strategies, and mental health after a traumatic event. Our findings suggest that the trauma of September 11, 2001, impacted diverse communities differently. First, ethnicity and gender predicted the content of immediate open-ended responses. Second, ethnicity and gender predicted subsequent outcomes over the 2 years following the trauma. In our analyses, comparable patterns emerged for African Americans and women, relative to Whites and men, respectively. In addition, the content of immediate open-ended responses predicted subsequent outcomes above and beyond the effects of ethnicity and gender. Specifically, expressing sadness and sympathy were associated with higher PTS symptoms. In addition, endorsing other reprisal against the people responsible for the attacks (i.e., not mentioning explicit violence) or action directed elsewhere was associated with better mental health outcomes, whereas endorsing violent retaliation or no action at all was associated with worse outcomes.

As hypothesized, ethnic background was a significant predictor of immediate reactions following the events. African Americans and “Other” ethnicities (e.g., Asian, East Indian) in this sample were significantly more likely than Whites to express emotion in general. Regarding specific coded emotions, African Americans were more likely than Whites to express feelings of sadness following the attacks and sympathetic sentiment towards the victims. Contrary to expectations, African Americans were nearly 90% less likely to endorse violent retaliation than Whites, and “other” ethnicities were less likely to endorse any type of action, including other forms of reprisal.

As we expected, women in this sample were more likely to express emotion in response to the September 11th attacks, which is consistent with previous research that women use more emotion-focused coping than men (Diener, Sandvik, & Larsen, 1985; Ptacek, Smith & Dodge, 1994; Tamres, Janicki, & Helgeson, 2002; Wadsworth et al., 2004; Walker & Chestnut, 2003). As predicted, women were more likely to express sadness and less likely to express anger than men. Women were also more likely to express sympathy toward the victims, consistent with prior literature indicating that women tend to be more sympathetic towards others than men (Grossman & Wood, 1993). More men than women responded with a problem-focused approach to the stressful event by endorsing action, which is consistent with prior research as well (Ptacek et al., 1994). Men were also more likely to advocate action directed towards the people responsible for the attacks, particularly through violent means. Taken as a whole, our findings demonstrate that men and Whites were more likely to have adopted a problem-focused approach to coping with the trauma, whereas women and Non-White ethnicities were more likely to have adopted an emotion-focused approach.

Ethnicity and gender also had robust effects on subsequent health outcomes. Similar to past studies that have linked Hispanics with having greater stress responses (Galea et al., 2002), Hispanics in our sample reported higher generalized distress and PTS symptoms than Whites. Previous research found women to be twice as likely as men to report PTS symptoms 1 to 2 months post 9/11 (Pulcino et al., 2003). We explored this effect further, showing that women experienced higher PTS symptoms that continued up to 2 years after the attacks. Women also experienced higher generalized distress and were diagnosed with more health ailments, even when controlling for the number of pre-9/11 physician diagnoses.

When considering both ethnicity and gender collectively, we found results consistent with

the “White male” effect in which Whites and men share more similarities in risk judgment to each other than they do to their counterparts (Flynn, Slovic, & Mertz, 1994). Although we did not focus on risk judgments, our study duplicated this pattern in that Whites and men consistently stood apart from women and ethnic minorities. Their responses were less likely to include emotion and more likely to include violence. When compared to women and other ethnicities, both Whites and men reported lower distress and PTS symptoms. This is consistent with past research in which women and ethnic minorities have been found to have consistently higher rates of PTSD and other complications after 9/11 (Galea et al., 2002; Pulcino et al., 2003; Weissman et al., 2005).

Our study further complicates the White/male effect by showing it to be a double-edged sword that is both an advantage and vulnerability. Past studies generally associated solely positive adjustment and outcomes with Whites and men; however, we found that this resiliency is not unconditionally inviolable. Our results suggest that even though the less emotional responses exhibited in Whites and men were associated with lower generalized distress and PTS symptoms, their propensity to advocate violence still linked them to worse outcomes over time. Although there were too few participants across the possible combinations to meaningfully test interactions between expressed emotions, endorsed actions, ethnicity, and gender, these effects remained substantively unchanged when all were simultaneously used to predict longitudinal outcomes, indicating their additive nature. Our findings further stress the importance of examining group responses to trauma, as no particular group is invulnerable to negative mental and physical health outcomes.

There are many unique advantages to the current investigation that add to the increasing amount of research focusing on the psychological impact of September 11th. First, our dataset was collected on September 11, 2001, and the first few days thereafter. Few researchers have been able

to document responses to trauma over a period of time starting with immediate reactions (Silver, 2004a). Immediate assessment allows for earlier detection of certain reactions associated with negative outcomes that may be obscured at later assessments. Second, our study draws from a large, nationwide sample of participants whose demographics closely mirror that of the U.S. Census population. The strength of the sample allows for investigation of the impact across multiple groups of various backgrounds. Past studies have typically used small and limited samples, thus restricting their generalizability and the extent to which they can assess differences in ethnicity and gender. Third, the method of data collection we employed improves upon that used in prior research. This study utilizes a relatively new mode of data collection through emailed prompts and online surveys. This not only offers greater anonymity than face-to-face or telephone interviews, but also improves upon the accuracy of reports of sensitive topics such as responses to September 11th (Schlenger & Silver, 2006). Online surveys also help increase the breadth of the sample and reduce inconvenience for participants.

Although our study addresses several shortcomings of previous research, it nonetheless has its own limitations. First, our coding scheme was based on the emotions and actions that were expressed and endorsed most frequently in responses; however, it is not an exhaustive representation. Some responses occurred too infrequently to meaningfully quantify and analyze. Second, we changed the instrument measuring PTS symptoms at 1 year post-trauma, at which point a more clinically relevant scale was adopted. This represents a methodological improvement, but comes at the cost of not being able to analyze all time points simultaneously. Finally, although we successfully maintained a nationally representative sample in the years following 9/11, our attrition was not completely random, and women and African-Americans were somewhat more likely to drop out of our study over time.

Future research should more closely examine specific factors associated with ethnicity and gender that may be relevant for responding to and coping with trauma, including values, previous experiences, emotions, interpretation of risk, priorities in risk situations, methods of reasoning with imminent threat, trust with authority, and familiarity with health care institutions. Thus, research should not only focus on detailing ethnic and gender differences in responses, as was done in this study, but should also attempt to tease apart specific explanations as to why they exist.

Conclusions

Ethnicity and gender color people's interpretation of events that they encounter in daily life, including risk-laden situations such as terrorist attacks. Individuals enter these situations with a set of values and belief systems that influence many aspects of their reactions. In this study, we demonstrated that individuals of different ethnicities and genders differed in their response to the trauma of September 11th. We also showed that ethnicity and gender, along with certain types of immediate responses, predicted future health consequences. Documenting the variety of short- and long-term responses to national tragedies can prevent researchers and policy-makers from falling prey to the myths of coping by mistakenly assuming universal responses to such disasters (Silver, 2004b), and can enable the design of intervention efforts that target those most vulnerable to terrorists' actions.

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Table 1. Demographic Characteristics of Respondents ($N = 1,559$)

Variable	<i>n</i>	%
Sex		
Men	757	49
Women	802	51
Ethnicity		
White, Non-Hispanic	1,114	73
Black/African American	151	10
Other (e.g., Asian American)	105	7
Hispanic	164	11
Household Income, \$		
<10,000	99	6
10,000-24,999	314	20
25,000-49,999	571	37
50,000-74,999	309	20
=/>75,000	262	17
Marital Status		
Married	942	61
Single	233	15
Divorced/separated	231	15
Widowed	129	8

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Education

Less than high school	147	9
High school diploma or equivalent	586	38
Some college or Associate degree	454	29
Bachelor degree or beyond	364	23

Age

$M = 50.27$ $SD = 17.01$

Table 2. Frequencies of Responses by Ethnicity and Gender ($N = 1,559$)

Variable	Total	White		Black		Other		Hispanic	
		Men	Women	Men	Women	Men	Women	Men	Women
	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)
Expressed Emotion	1,147 (74)	334 (63)	469 (80)	51 (73)	73 (90)	40 (74)	45 (88)	56 (62)	62 (85)
Anger	117 (8)	48 (9)	40 (7)	6 (9)	5 (6)	5 (9)	3 (6)	5 (5)	5 (7)
Sadness	263 (17)	60 (11)	118 (20)	17 (24)	20 (25)	6 (11)	8 (16)	9 (10)	19 (26)
Sympathy	388 (25)	86 (16)	173 (30)	17 (24)	27 (33)	7 (13)	20 (39)	17 (19)	30 (41)
Endorsed Action (Any)	492 (32)	208 (39)	163 (28)	22 (31)	21 (26)	14 (26)	13 (25)	27 (30)	18 (25)
Violent Retaliation	129 (8)	68 (13)	32 (5)	2 (3)	0 (0)	5 (9)	5 (10)	11 (12)	5 (7)
Other Reprisal	246 (16)	103 (19)	83 (14)	15 (21)	11 (14)	8 (15)	3 (6)	12 (13)	8 (11)
Action Directed Elsewhere	117 (8)	37 (7)	48 (8)	5 (7)	10 (12)	1 (2)	5 (10)	4 (4)	5 (7)

Note. Percents were calculated within each column (e.g., percent of Non-Hispanic White Men who expressed emotion).

Table 3. Ethnicity and Gender Predicting Open-ended Responses in the Days Following 9/11

Variable	Expressed Emotion	Endorsed Action (Any)
	AOR (95% CI)	AOR (95% CI)
Ethnicity ^a		
Black/African American	2.29 (1.43-3.66) **	0.91 (0.61-1.35)
Other (Asian American)	1.66 (0.97-2.84)	0.59 (0.35-0.98) *
Hispanic	1.10 (0.75-1.61)	0.75 (0.50-1.12)
Gender ^b		
Women	2.43 (1.89-3.13) **	0.53 (0.42-0.68) ***

^a Reference group is Non-Hispanic White; ^b reference group is men

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 4. Demographic and Immediate Reactions Predicting Longitudinal Physical and Mental Health Outcomes.

Variable	Generalized Distress	PTS Symptoms	PTS Symptoms	Physical Health
	6-24 mo. Post-9/11	2-6 mo. Post-9/11	12-24 mo. Post-9/11	12-24 mo. Post-9/11
	<i>B (SE), β</i>	<i>B (SE), β</i>	<i>B (SE), β</i>	<i>B (SE), IRR</i>
Ethnicity (vs. Non-Hispanic Whites)				
Black/African American	-----	-----	-----	-----
Other (e.g., Asian American)	-----	-----	-----	-----
Hispanic	0.052 (0.017), 0.080 **	-----	0.043 (0.018), 0.065 *	-----
Gender (vs. Men)				
Women	0.035 (0.009), 0.091 ***	0.067 (0.015), 0.154 ***	0.042 (0.010), 0.109 ***	0.133 (0.038), 1.142 ***
Expressed Emotion				
Anger	-----	-----	-----	-----
Sadness	-----	0.041 (0.017), 0.072 *	-----	-----
Sympathy	-----	-----	0.024 (0.013), 0.054 †	-----
Endorsed Action (vs. Violent Retaliation)				

No Action	-0.035 (0.018), -0.085 *	-----	-----	-----
Other Reprisal	-0.052 (0.019), -0.099 **	-----	-----	-----
Action Directed Elsewhere	-0.059 (0.022), -0.080 **	-0.076 (0.038), -0.091 *	-----	-----
Endorsed Action (vs. No Action)				
Other Reprisal	-----	-----	-0.028 (0.014), -0.051 *	-----
Action Directed Elsewhere	-----	-0.070 (0.028), -0.083 *	-0.040 (0.020), -0.054 *	-----

Note. Dashes indicate variables not included due to non-significance ($p > .05$). Reported β s for GEE analyses were calculated using the *SD* of all observations of each outcome variable across all waves of data collection.

[†] $p = .054$, * $p < .05$, ** $p < .01$, *** $p < .001$