Judged Terror Risk and Proximity to the World Trade Center

BARUCH FISCHHOFF*   baruch@cmu.edu
ROXANA M. GONZALEZ
DEBORAH A. SMALL
JENNIFER S. LERNER
Department of Social and Decision Sciences, Carnegie Mellon University, Pittsburgh, PA 15213

Abstract

In November 2001, a nationally representative sample of Americans ($N = 973$, ages 13–88), queried via WebTVs at home, judged the probability of five terror-related events (e.g., being injured in an attack) and three "routine" risks (e.g., being a victim of other violent crime), in the following 12 months. Judgments of terror risks, but not routine risks, were related to whether respondents were within 100 mi of the World Trade Center. This relationship was found only in the following demographic groups, and not their complements: men, adults, whites, and Republicans. These differential responses to risk have both theoretical and policy implications.

Keywords: risk perception, terrorism, gender, political affiliation, race, adolescents

JEL Classification: C93, D78, D84, Z00

1. Introduction

The terrorist attacks of 2001 injured or killed thousands of people in the United States. Their loss was shared by family and friends around the world. Millions more felt pain and sympathy. People everywhere needed to consider their own exposure to terrorism. When successful, terrorism leaves everyone feeling like a potential target. Yet, even the worst terrorist attack in US history caused physical injury to but a tiny fraction of the population (very roughly, 0.00001%). Without diminishing that loss, Americans must evaluate the threat of future attacks. Those risk estimates must guide them in both personal and civic behavior (e.g., what precautions to take, what civil liberties to surrender) (Fischhoff, 2002; Viscusi and Zeckhauser, 2003).

There is a natural gradient of sympathy with loss, beginning with immediate relatives, extending to friends and kin, then to others with shared features—and moderated by individual differences in sympathetic tendency (Archer, 1999; Shuchter and Zisook, 1993). The gradient for judged risk is less clear, especially with an enemy said to have planted sleeper cells throughout the country. The processes determining terror risks are so complex and poorly understood (by experts, much less the general public) that all citizens might feel

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*To whom correspondence should be addressed.

equally at risk. On the other hand, people might use even rudimentary theories of terrorism to derive differential predictions of vulnerability: Who are the terrorists' targets? Who can take effective protective action?[1]

A national survey conducted in November 2001 (Lerner et al., 2003; described below) suggests some differential predictions, and affords the opportunity to test for others. Respondents estimated the probability of eight risk-related events occurring in the succeeding 12 months, for themselves and for the "average American." Given the randomly sampled respondents, the average of their personal risk judgments represents how Americans, on average, estimate their risks. Despite the novelty and emotional power of terrorism's threats, these results replicate a pattern seen in hundreds of studies concerning diverse risks (Weinstein, 2000). People see themselves as facing less risk than the average for a comparison group to which they belong (Quadrel, Fischhoff, and Davis, 1993; Weinstein, 1980). This pattern could reflect motivational biases (e.g., the desire to feel more secure) or cognitive ones (e.g., not realizing how much easier it is to see one's own precautionary measures, compared to others').

Female respondents saw greater risk than did males (both for personal risks and for the average American's). Much of this difference seemed to reflect men's experiencing greater anger, leading to greater optimism. Lower risk judgments among more angry individuals were observed with both naturally occurring and experimentally induced emotions (Lerner et al., 2003).

Risk judgments were similar for adult and adolescent (ages 13–17) respondents.

1.1.   Does distance affect risk judgments?

The preceding analyses focused on individuals, rather than on their circumstances. The present study considers one situational factor: how far an individual lives from the places already attacked. Although terrorists might strike anywhere, the September 2001 assaults were concentrated in the Mid-Atlantic states. That clustering could encourage the lay theory that these places, with their concentration of media and government, are terrorists' main targets. Furthermore, as intensely as the attacks were covered in the national media, the events themselves saturated life most intensely in their immediate proximity, through personal stories, physical reminders, and direct experiences. These exposures may have had both visceral effects, creating fear and anger, and cognitive ones, conveying details about the horror of the attacks and the obstacles to effective self-defense.[2] Thus, those close to attacks may both see and feel more of both components of risk: higher probabilities and greater consequences.

Cognitively, that pattern could reflect a widely shared expectation that terrorists will return to targets whose importance (and vulnerability) has already been demonstrated, reflecting the availability of the 2001 crimes (Tversky and Kahneman, 1973). Emotionally, that pattern could mean that distance reduces the feelings that may partially shape risk perceptions (Loewenstein et al., 2001). On the other hand, if risk judgments are unrelated to distance, then people everywhere may accept the "nation at war" argument, whereby any place is equally a target.

1.2. Potential moderators of a distance effect: Age, sex, race/ethnicity, political affiliation

These processes need not emerge similarly for all groups. As noted, men and women generally responded differently to the risks. They may also be differently attuned to correlates of distance from the 2001 targets, perhaps holding different implicit theories, perhaps experiencing the associated emotions differently, as happened with fear and anger. Women's more relational self-construal (Cross and Madson, 1997; Baumeister and Sommer, 1997; Gabriel and Gardner, 1999) may make them feel closer to people elsewhere, with more interlinked fates.

Another potentially relevant factor is age. A widely held view attributes a special sense of invulnerability to adolescents. However, survey results have typically not supported this claim (Fischhoff et al., 2000; Millstein and Halpern-Felsher, 2002; Quadrel, Fischhoff, and Davis, 1993). If anything, teens seem to draw fewer distinctions between themselves and others, and report less relative invulnerability. As a result, they might be less sensitive to distance than adults. Little is known about risk perceptions over the life span. Vulnerability judgments do decrease with judgments of personal control (e.g., Quadrel, Fischhoff, and Davis, 1993; Weinstein, 2000). Feelings of control are most pronounced among individuals in their middle years, who have established themselves in life, without experiencing the losses associated with aging (Mirowsky, 1995; Shaw and Krause, 2001). They might also see more correlates of distance providing some control over terror risks.

Vaughan (1993) and Slovic (2000) have summarized studies showing distinctly smaller judgments of risk among politically conservative white males, who feel (and perhaps exert) relatively high control over their surroundings, with relatively great trust in technologies and the institutions managing them (see also Blocker and Eckberg, 1989). Such individuals might also be attuned to distance-related factors enhancing perceived control (Ross and Mirowsky, 2002).

From a "risk as feeling" perspective (Loewenstein et al., 2001), fear is an affective determinant of perceived risk (Lerner and Keltner, 2001). As a result, emotions and risk judgments could vary together.

The November 2001 survey results allow testing for these hypothesized population differences, as well as determining any spillover from personal risk judgments to ones for the average American. Where one lives does not, of course, affect where others live nor their risks. However, judgments (and feelings) about personal risks may anchor judgments of others' risks (Tversky and Kahneman, 1974), indirectly creating distance effects.

1.3. Overview

Section 2 reviews the survey method, sample, and measures, including the operationalization of distance. Section 3 reports results. Overall, respondents outside the immediate attack area saw less personal risk from terror than did those close by. However, this main effect for distance obscured significant interactions with each of the focal demographic variables. Men, adults, whites, and Republicans reported lower terror risks when living outside the immediate area; members of the complementary groups did not. Judgments of

routine risks were unrelated to distance as were judgments of the average American's risks. Section 4 discusses implications of these differential responses to the national challenge of terrorism.

2. Method

2.1. Sample recruitment

Knowledge Networks Inc. has recruited 75,000 households to participate in a nationally representative Web-enabled panel. The distribution of the panel members closely tracks that of the U.S. Census on key demographic dimensions such as age, race, ethnicity, geographical region, employment status, income, and education (Krotki and Dennis, 2001).[3]

Panel households receive free WebTV and interactive Internet access, in return for completing 10–15 min Internet surveys 3–4 times per month.[4] Survey responses are confidential, with identifying information never revealed without respondent approval. When a survey is available, notice is sent through respondents' password-protected e-mail account. Surveys are self-administered and accessible throughout a designated period (typically 14 days). Respondents can complete a survey only once and may stop at any time, without affecting their WebTV and Internet service.

The Knowledge Networks panel is developed with probability methods for creating national survey samples and recruited with stratified random-digit-dialed telephone sampling, among all US households. Telephone numbers are selected from the $1 +$ banks, with equal probability of selecting each member, and updated quarterly.

At the time of this survey, the panel recruitment response rate was 44%, with 36% of the recruited panel available for selection.[5] To correct for any nonresponse bias, representative samples were selected by poststratification weighting of the panel to match benchmarks from the most recent US government statistics for sex, age, race, ethnicity, education, and region. Samples are drawn with probabilities proportional to the panel weights, using a systematic sample applied to eligible panel members. Eligible panel members resemble the national population distributions for key demographic variables, within sampling error.

2.2. Sample

Knowledge Networks administered the survey between November 10 and November 29, 2001. Notice of the survey was sent to a national random sample of 1,786 individuals (ages 13–88), including 1,407 adults (697 males and 710 females) and 379 teens (189 males and 190 females). Of those, 62.0% of the adults (425 males and 447 females) and 41.7% of the teens (77 males and 81 females) completed the survey. We removed 57 individuals because (a) they answered less that 25% of the questions ($n = 13$), (b) skipped all the emotion manipulation check questions ($n = 14$), or (c) gave zeros to all of the emotion manipulation-check (see below) questions ($n = 30$). The final sample had 973 respondents (830 adults and 143 teens).

Demographics for the teen and adult samples roughly matched Census figures. Both were 49% male. Mean ages were 45.9 ($SD = 16.8$, range 18–88) and 15.3 ($SD = 1.15$, range $= 13$–17), respectively. Self-reported race/ethnicity was 12% African-American/Non-Hispanic, 12% Hispanic, 8% Other/Non-Hispanic, and 68% White/Non-Hispanic.[6] Among adults, 14% reported not finishing high school, 31% graduating high school or receiving a GED, 23% having some college but no degree, 23% graduating from a 2- or 4-year college, and 9% having advanced degrees.

2.3. Experimental manipulation

As respondents opened the survey, they were randomly assigned to one of three emotion conditions. They answered questions about their current mood, then received a two-part emotion induction. The first part had them answer the open-ended question, "what aspect of the terrorist attacks makes you the most ANGRY and why does it make you so ANGRY?" They were asked to provide as much detail as possible, "so that someone reading it might even get ANGRY from learning about the situation." The other two conditions replaced ANGRY with AFRAID or SAD.

In the second part, respondents saw a picture and heard an audio clip about terrorism that had, in pretests, enhanced the target emotion more than the other two. The *anger* manipulation involved an Arab country celebration of the attacks. The *fear* manipulation warned of anthrax and bioterrorism. The *sad* manipulation involved a pregnant widow mourning her husband, lost in the World Trade Center.

2.4. Risk judgment measures[7]

Respondents judged the probabilities of eight events occurring within the next 12 months, five concerning terrorism and three routine risks (see Table 1). They did so first for themselves and then for the "average American," with scale anchors of 0% (*the event is impossible*) and 100% (*the event is certain to happen*). Responses indicated a common underlying construct, with individuals tending to report relatively high or relatively low risks. For personal risks, Cronbach α values were .74 for all 8 items, .73 for the five terrorism items, and .69 for the three non-terrorism items; for average American, the corresponding values were .85, .79, and .79. Item responses were negatively skewed (toward low probabilities), while averages were more normally distributed.

2.5. Manipulation checks

At the end of the survey, respondents reported how they felt while writing, viewing the picture, and hearing the audio clip. Each of the three emotions was represented by five scales, anchored at 0 (*do not feel the emotion the slightest bit*) and 8 (*feel the emotion even more strongly than ever before*). Responses for each emotion showed consistency (anger $\alpha = .94$, fear $\alpha = .94$, sadness $\alpha = .89$) and were pooled.

Table 1. Correlations between judged personal risk and log Arc View distance from the WTC, by age.

Event	Age								
	18–22 (n = 36)	23–27 (n = 100)	28–32 (n = 103)	33–37 (n = 97)	38–42 (n = 84)	43–47 (n = 87)	48–52 (n = 73)	53–57 (n = 83)	58–62 (n = 53)
Terror-related risks									
Being hurt in a terror attack	−.31	−.31***	.16	.07	−.42***	−.31***	−.07	−.33***	−.23
Having trouble sleeping because of the situations with terror	.04	.05	.14	.01	−.19	−.17	.08	−.18	−.02
Traveling less than usual	−.02	−.04	−.02	.25*	−.18	−.28***	.07	−.10	−.06
Screening mail carefully for suspicious items	.16	−.15	−.14	−.10	−.25**	−.24*	−.09	−.06	−.14
Taking antibiotics for anthrax	−.13	.01	−.13	.25***	−.27*	−.27*	−.07	−.23*	−.26*
Mean of terror-related risks	−.11	−.02	−.06	−.15	−.37***	−.33***	.08	−.01	−.42***
Routine risks									
Getting the flu	−.05	−.07	.11	.27	−.23	−.09	−.22	.04	.11
Being the victim of violent crime (other than terror)	−.07	−.30	.29	.19	−.19	−.20	−.05	−.13	−.23
Dying from any cause (crime, illness, or accident)	−.19	−.33	.19	.05	−.12	−.23	−.04	−.05	−.11
Mean of routine risks	−.02	−.04	.13	.08	−.38***	−.05	−.29*	.11	−.20
Overall									
Mean of all risk judgments	−.06	−.03	.01	−.07	−.39***	−.35**	−.06	.04	−.40***

Notes. There were no significant correlations for groups above age 62; sample sizes of those groups were: 63–67 (n = 58), 68–72 (n = 41), 73–77 (n = 35), 78–82 (n = 24), 83–88 (n = 8).

All p values are two-tailed. $*= p \le .05$; $**= p \le .01$; $***= p \le .001$. Given the large number of statistical tests and the corresponding chance of Type I errors, correlations significant at the .05 level should only be taken as suggestive. Within the table, and the paper more generally, the likelihood of achieving significance for a given absolute correlation varies by cell because of differences in the number of subjects.

2.6. Distance measures

We chose the World Trade Center (WTC), as the most salient target of the September 11th attacks and the attendant media coverage, as well as being close to an epicenter of the anthrax attack. Post-attack stress levels have also been found to be significantly higher there than elsewhere (Schlenger et al., 2002; Schuster et al., 2001). Following Schuster et al. (2001), we defined the immediate area as within 100 mi. Intuitively, it approximates the media, commuting, and shopping vicinity for New York City. In addition, its population density provides a reasonably sized sample, for comparing individuals inside and outside the immediate area.

Distance was defined as air distance. It was measured with ArcView, computing spherical distance between centroids of ZIP codes for WTC and each respondent. Road distance was also computed, using MapQuest. Over all respondents, the correlation between the two distance measures was $r = .99$, $p < .001$. The mean difference was 135 mi, the median 81 mi, and the range 0–521 mi. Because MapQuest's function is proprietary, we used ArcView in all statistical analyses.[8]

3. Results

3.1. Choosing a measure of psychological distance

Assuming that psychological distance has decreasing marginal sensitivity to geographical distance, we used log ArcView distance in our analyses. Log ArcView distance showed a weak negative correlation with mean probability judgment for the eight personal risks ($r = -.06$; $p < .06$). There was a larger point-biserial correlation ($r = -.09$; $p < .01$) between mean probability judgment and whether or not respondents were within 100 miles of the WTC. Given the simplicity of the dichotomous distinction between being inside or outside the 100-mi zone, all analyses consider point-biserial correlations between risk judgments and log ArcView distance.

Distance was significantly correlated with mean judgments for the five terror risks ($r = -.10$, $p < .001$), but not for the three routine risks ($r = -.03$, $p > .1$). There were significant correlations for two items, both terror-related: being hurt in a terror attack and screening one's mail for suspicious items. As seen in the analyses that follow, judgments for the terror and routine risk items typically showed quite different relationships with distance. As a result, any correlation for all eight items reflects a weighted average of potentially different processes in judging the two classes of risk. Those correlations are presented for completeness, rather than any inherent interest. As seen below, distance matters for judging these five terror risks, but not these three routine risks.

3.2. Age effects

Risk judgments showed a strong interaction between adulthood (scored 0 = teen, 1 = adult) and distance for the five terror risks ($t(971) = -5.70$, $p < .001$), only a weak one for the three routine risks ($t(971) = -3.01$, $p < .05$). The interaction reflects teens' risk judgments

being unrelated to distance—for terror items, routine items, or any individual item. In contrast, adults' risk judgments were significantly correlated with distance for the terror items ($r = -.11$, $p < .001$), but not for the routine items ($r = -.03$, $p < .06$). We only consider adults in subsequent analyses.

Adults' sensitivity to distance showed a curvilinear relationship with age. Dividing adults into 5-year brackets (beginning with 18–22), the strongest correlations with distance were in the 38–42 ($r = -.37$, $p < .001$) and 43–47 ($r = -.33$, $p < .001$) age groups (Table 1). Thus, middle-aged individuals showed the sharpest tendency to see less terror risk when outside the WTC area.

3.3. Gender effects

Risk judgments showed a significant gender-distance interaction for the five terror risks ($t(971) = 5.84$, $p < .001$), but not for the three routine risks ($t(971) = 1.18$, $p > .1$). Whereas men outside the WTC area saw less terror risk than did men inside ($r = -.18$, $p < .001$); females living inside and outside the area saw similar terror risks ($r = -.07$, $p > .1$). Males were so sensitive to distance that, inside the WTC area, men and women had similar mean terror risks judgments (37.4% vs. 41.6%, $p > .1$). Within the WTC area, only one terror item had a significant gender difference (women saw a higher probability of having trouble sleeping; 36.8% vs. 19.2%, $p < .01$). Outside, women saw higher personal risk on every terror risk.

Routine risk judgments were not significantly related to distance for males ($r = -.10$, $p > .1$) or females ($r = .04$, $p > .1$).

3.4. Race/ethnicity effects

Terror risk judgments had a significant interaction between distance and race/ethnicity ($t(971) = 4.04$, $p < .001$). White/non-Hispanics ($n = 652$) outside the WTC area saw significantly less terror risk ($r = -.10$, $p < .01$); that correlation held for males ($n = 307$, $r = -.20$, $p < .001$), but not for females ($n = 345$, $r = -.04$, $p > .1$). Hispanics' terror risk judgments were unrelated to whether they were in the WTC area, for males ($n = 46$, $r = -.13$, $p > .1$), females ($n = 50$, $r = -.17$, $p > .1$), or combined ($n = 96$, $r = -.07$, $p > .1$). African-Americans' risk judgments were similarly unrelated to whether they were in the WTC area, for males ($n = 42$, $r = -.10$, $p > .1$), females ($n = 61$, $r = -.03$, $p > .1$), or combined ($n = 103$, $r = -.07$, $p > .1$). Only one item revealed any sensitivity to distance among Hispanics or African-Americans: Hispanic males in the WTC area estimated a higher probability of screening mail than those outside it ($r = -.25$, $p < .05$).

Thus, the overall correlation between distance and terror risk judgments reflects adult white males. Among those between 38 and 47 ($n = 106$), the correlation was $-.23$ ($p < .05$).

There was no interaction between distance and race/ethnicity for routine risks ($t(971) = .43$, $p > .1$).

3.5. Party affiliation effects

Terror risk judgments showed a strong interaction between distance and party affiliation for the terror risks ($t(971) = 3.19$, $p < .001$). Distance was significantly correlated with terror-related risk judgments for Republicans ($n = 191$; $r = -.15$, $p < .01$), but not for people reporting Democrat or other political affiliations ($n = 333$; $r = -.09$, $p > .1$).

There was no interaction between distance and political affiliation for routine risk judgments ($t(971) = 1.01$, $p > .1$). They were unrelated to distance for either group.

3.6. Distance-sensitive subgroups

These analyses suggest that the greatest sensitivity to distance is found among middle-aged male Republicans. Even in an overall sample this large, that is a fairly small group: 27 people between 38 and 47. Nonetheless, their terror risk judgments were significantly correlated with distance ($r = -.58$, $p < .001$). Mean risk judgments on the individual items, for those inside and outside the 100 mi zone, respectively, were: hurt in a terror attack (43.7% vs. 13.9%), have trouble sleeping (33.8% vs. 7.3%), travel less (83.6% vs. 22.9%), screen mail (74.3% vs. 39.5%), and take antibiotics against anthrax (31.9% vs. 9.2%). Routine risk judgments were not significantly correlated with distance ($r = -.30$, $p > .1$).

All adult male Republicans ($n = 112$) were more sensitive to distance than were all other adult males, for terror risks ($r = -.27$ vs. $-.15$), but not for routine risks ($r = -.10$ vs. $-.09$). Adding female Republicans reduces the correlations between risk judgment and distance to $-.15$, for terror risks, and $-.04$, for routine risks.

Among women, there were no significant correlations between risk judgments and distance, within any age, race/ethnicity, or political affiliation group.

3.7. Correlates of risk judgments

Table 2 summarizes the sensitivity of risk judgments to all variables considered here. Terror risk judgments were most strongly related to age ($t = -5.98$, $p < .001$) and gender ($t = 6.95$, $p < .001$), with similar, but smaller relationships with distance ($t = -3.17$, $p < .001$), race/ethnicity ($t = 4.11$, $p < .001$), and political party affiliation ($t = 3.09$, $p < .001$) ($df = 971$, in all cases). Age was the only strong predictor of routine risk judgments ($t = -3.14$, $p < .001$).

3.8. Distance and emotion

Reported emotions were unrelated to distance, in the whole sample or the subgroups created by dividing respondents by gender, adulthood, or race/ethnicity. The absence of a significant correlation for adult men ($r = -.07$, $p > .1$) means that those outside the WTC area saw less personal risk without reporting the anger that might have increased optimism.

Table 2. Regression scores predicting risk judgments based on respondents' distance from WTC, age, gender, race/ethnicity, and political affiliation.

Variable	B	Std. error	β	t (971)
Terror-related risks				
Distance from WTC	−8.79	2.77	−.10	−3.17***
Age	−.22	.04	−.19	−5.98***
Female	9.70	1.40	.22	6.95***
Non-white	6.98	1.70	.13	4.11***
Non-Republican	5.59	1.81	.10	3.09***
Routine risks				
Distance from WTC	−2.41	2.66	−.03	−.91
Age	−.15	.03	−.11	−.3.14***
Female	2.88	1.34	.07	2.15*
Non-white	2.61	1.63	.05	1.60
Non-Republican	1.01	.91	.03	1.07
Overall				
Distance from WTC	−6.30	2.31	−.09	−2.73**
Age	−.10	.03	−.10	−.3.13***
Female	7.29	1.16	.20	6.27***
Non-white	5.65	1.42	.13	3.99**
Non-Republican	3.54	1.57	.04	2.11*

Notes. Distance from WTC was 0/1, indicating within 100 mi of the WTC or not; age was quadratic (with a negative sign indicate higher risk judgments for respondents with ages in the middle of the range); gender was $0 =$ male and $1 =$ female (such that a positive sign indicates females seeing greater risks); race/ethnicity was $0 =$ white and $1 =$ non-white (such that a positive sign indicates non-whites seeing greater risk); political affiliation was $0 =$ Republican and $1 =$ non-Republican (such that a positive sign indicates non-Republicans seeing greater risk).
All *p* values are two-tailed. $^* = p \leq .05$; $^{**} = p \leq .01$; $^{***} = p \leq .001$. ($N = 973$).

A regression analysis, paralleling that of Table 2, found that none of the demographic variables predicted self-reports for any of the three emotions. Thus, gender, age, ethnicity, and party affiliation were associated with risk judgments, but not emotions.

3.9.   Average Americans

There were no statistically significant correlations between distance and the risk assigned to the average American, for any item or set of items, or for any group.

4.   Discussion

In mid-November 2001, Americans saw greater personal risk from terror, if they lived within 100 mi of the WTC than if they lived further away. However, this overall sensitivity

to distance masked interactions with several demographic variables, such that sensitivity was found in some groups, but not others: Men, adults, whites, and Republicans saw less personal risk, if they were outside the immediate New York areas; members of the complementary groups did not.

The cumulative effect of these distinctions is quite large. For the most directly relevant item, being hurt in a terror attack, the correlation between distance and judged personal risk is $r = -.37, p < .01$, for white male Republicans, ages 38–47. These results show this group's special view of risk, identified by previous investigators (Slovic, 2000; Vaughan, 1993)—remained even with the events of September 11th, except for group members closest to the WTC epicenter. For other people, terror seemed equally threatening wherever they lived.

Where respondents lived was unrelated to their judgments of the three routine risks or of the risks faced by the average American. Thus, there was no spillover from terror risks to other ones (Johnson and Tversky, 1983). Age was the only demographic variable correlated with routine risk judgments. Age was not related to judgments of risk for the average American, hence might reflect actual differences in personal risk.

We do not know the sources of this pattern of differential sensitivity to distance. It could reflect differences in lay theories of terrorism, self-presentation, or self-protective mechanisms. For example, members of the distance-sensitive groups might have greater feelings of personal control or trust in the social institutions managing risks (Ross and Mirowsky, 2002; Slovic, 2001), even with terror-related events. However, these tendencies were swamped by the intensity of the September 11th events and their immediate aftermath—for those most directly affected by them, close to the WTC.

One can only speculate on how these differences might affect our ability to reach national consensus on the risks of terror and the effectiveness of strategies for dealing with them. The groups seeing less terror risk here have, of course, demographics closer to those of our current national leadership than do other respondents. Those leaders might face particular challenges in conveying their vision of our circumstances and appropriate responses.

In the year following the survey, there were, fortunately, no major terror attacks in the United States, meaning that lower risk estimates proved to be more accurate. However, without a formal analysis of what the risks were in November 2001, one cannot say which groups made sounder inferences, based on the information available to them at the time (Fischhoff et al., 2002).[9]

Table 3 summarizes terror risk judgments for individuals inside and outside the WTC area. Trying to avoid hindsight bias, these judgments seem understandable and moderately defensible for the three middle items. Many people may already have been having trouble sleeping (Schlenger et al., 2002; Schuster et al., 2001). At the height of the anthrax crisis, they may already have been checking their mail. Given the weak economy and disruptions in air travel, they may have been traveling less.

The two other risks (being injured in a terror attack, taking antibiotics against anthrax) show large disparities between mean and median judgments. These can largely be attributed to a seeming excess of 50% responses, leading to a bi-modal distribution, with most responses clustered among much lower responses. Within the WTC area, 43.6% of respondents gave 50% for the probability of being hurt in a terror attack, compared to 19.9% of those outside it. For taking antibiotics against anthrax, the respective rates of 50%

Table 3. Probability judgments for terror risks.

Event	Mean	Median	%50
Respondents WITHIN 100 mi of WTC			
Being hurt in a terror attack	30.6	30.7	43.6
Having trouble sleeping because of the situation with terror	26.0	20.0	8.8
Traveling less than usual	41.3	47.9	18.4
Screening mail carefully for suspicious items	71.0	81.4	6.2
Taking antibiotics against anthrax	27.1	10.0	10.1
Respondents OUTSIDE 100 mi of WTC			
Being hurt in a terror attack	19.7	10.0	19.9
Having trouble sleeping because of the situation with terror	23.3	10.0	8.4
Traveling less than usual	33.5	20.0	10.5
Screening mail carefully for suspicious items	52.3	50.0	10.8
Taking antibiotics against anthrax	21.9	5.0	11.3

responses were 10.1% and 11.3%. Other research suggests that such responses may not reflect probabilities, but expressions of epistemic uncertainty, not knowing what to say or not wanting to think about a topic. In effect, respondents are saying "50/50," rather than giving a numerical probability. Such responses are particularly common with open-ended response modes and personally threatening events, like those here (Fischhoff and Bruine de Bruin, 1999; Bruine de Bruin et al., 2000, 2002).

These analyses used one measure of distance from the terror attacks, the log of the ArcView (spherical) distance from the World Trade Center. Results were very similar when using the actual (non-log) distance or that provided by MapQuest. One could also measure distance from the other major September 11th sites, or other places that residents view as targets (e.g., Los Angeles as a media center or Atlanta as home to CDC). If residents elsewhere felt targeted, that would dilute the correlation between risk judgments and being near the WTC.[10]

These results came from a nationally representative sample, all of whom received an emotion-heightening manipulation, requiring a short written statement and experiencing stimuli drawn from major news media. As such, the study contained stimuli and questions like those that many people encountered naturally in November 2001. Respondents' individual experiences doubtless varied. However, like other Americans, they faced the challenge of estimating risks, knowing that historical statistics have uncertain value. Close to New York City, Americans saw their risks similarly. Outside the immediate area, where the events might not have been quite so overwhelming, their views diverged, with some groups seeing less personal vulnerability. They need to articulate and coordinate their mental models of terror risks, if all Americans are to act together in facing these threats.

Acknowledgments

Notes

1. The October 2002 Washington, DC-area sniper crisis created a ready market for theories, however poorly grounded, for identifying situations and strategies to reduce risk (e.g., Davis, 2002; Gettleman, 2002).
2. The Israel daily, *Ha'aretz* (http://www.haaretzdaily.com/), carries occasional features on the lives of the seriously wounded survivors of suicide bombings. Such details amplify the consequences of the crimes, in a way that complements the vignettes of World Trade Center fatalities, carried by the *New York Times* (http://www.nytimes.com/pages/national/portraits/).
3. For details on the demographics of Knowledge Networks' 75,000 member panel, see http://www.knowledgenetworks.com/ganp/safe/surveymethod.html).
4. The panel does not respond significantly differently over time to surveys than more "naïve" survey respondents (Dennis, 2001).
5. The rate used for calculating the response rate for households recruited by Random Digit Dialing is AAPOR Response Rate No. 3, the response rate formula approved by the American Association for Public Opinion Research. The definition of an RDD recruited household is that an adult in the household agrees to join the panel and accept delivery of the WebTV on behalf of the household.
6. When an adolescent did not self identify race, we used parental race. When that was missing, race was randomly assigned according to the proportions in cases where race is known.
7. Details on the risk perception scale items and emotion manipulation check items with descriptive statistics are provided in an appendix, available online (http://computing.hss.cmu.edu/lernerlab/appendixFinal.pdf) or from the authors.
8. During the Cold War, air distance might have captured the primary concern, blast from thermonuclear weapons. With terror, air distance might capture risks from bombs, radiological weapons, toxic chemical aerosols, and other airborne hazards. Road distance might capture bioterrorism risks, which depend on the movements of individuals (or animals), and shape individuals' sense of closeness, by affecting their commuting, shopping, and visiting behavior. Beyond a focal target's immediate area, air and road distance will, generally, be strongly correlated. The complex geography of the New York City area produced the greatest relative differences in the two distance measures. Unfortunately, there were too few respondents within the area to compare these measures psychological relevance.
9. About two-thirds the present sample answered these questions again, in a second round of the survey, conducted a year later, at the end of 2002. Preliminary analyses show a replication of the distance effects reported here. They also show a large reduction in judged terror risks—and hindsight bias, such that respondents believe that they saw smaller risks in November 2001 than they actually had.
10. Candidate features need to be determined prior to analyses, lest an open-ended quest for correlates inflate the risk of capitalizing on chance.

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