Assessing the Usefulness of the U.S. Department of Homeland Security’s Terrorism Advisory System

Ann Marie Major
College of Communications
The Pennsylvania State University
University Park, PA 16802
USA
amm17@psu.edu

and

L. Erwin Atwood
College of Communications
The Pennsylvania State University
University Park, PA 16802
USA
lea2@psu.edu

This study reports the results of a national survey of 1,023 U.S. adults and their evaluations of the usefulness of the color-coded U.S. Department of Homeland Security’s (DHS) Advisory System. The study explores the relationships among information sources, risk perception, demographics, and preparedness behaviors within the context of the social amplification of risk. Half of the respondents (48.8%) rated the advisory system as useful and half (47.0%) rated it as not useful; however, far fewer respondents reporting having made any preparations for a future attack. Strong support was found for the social amplification of risk model with 87.1 percent of the respondents reporting that terrorism was an important problem and two-thirds of those respondents reporting that news reports had influenced how important they believed the problem was. The findings also underscore that information sources were not of consequence for all respondents, and that it was the perceived utility of the advisory system, not risk perception, that impacted whether or not respondents made preparations.
Following the September 11, 2001, attack on New York City’s World Trade Center, opinion polls consistently have indicated that 62 to 80 percent of the American public agrees that a future terrorist attack on the United States continent is likely to occur (Huddy, Khatib and Capelos 2002). These high proportions of respondents contrast sharply with opinion polls conducted after the April 5, 1986, La Belle disco bombing in Berlin that targeted U.S. military personnel and the October 12, 2000, suicide attack on the U.S.S. Cole where months after the bombings less than 25 percent of the respondents believed another attack would take place.

The 2001 attack appears to have heightened public concern about the threat of terrorism on U.S. soil. However, Huddy et al. (2002) reported that following that attack, only 20 percent of the respondents polled expressed a great deal of confidence in the U.S. government’s ability to reduce the threat of a future attack. Despite fears that future attacks will take place, few Americans have undertaken preparations to mitigate the damage of a potential terrorist attack. Understanding the social context of the public’s response to the threat of terrorism and the influence of perceived risk on preparedness is a problem for which the solution continues to elude disaster researchers and mitigation experts.

The crux of the problem is motivating the public to move from understanding the risk to undertaking preparations. However, despite heightened concern among Americans about the threat of terrorism, most people perceive the risk of terrorism as so ambiguous that they believe little can be done to reduce the consequences of such a disaster (Weinberg and Davis 1989). People who score high on perceived risk are more likely to engage in preparedness behaviors (Sattler, Kaiser and Hittner 2000); however in response to the threat of terrorism only about one in 10 respondents actually undertake preparations including stock-piling food and water and changing travel plans (Huddy, Feldman, Capelos and Provost 2002).

The focus of this study is to evaluate the perceived usefulness of the color-coded U.S. Department of Homeland Security’s (DHS) Advisory System and to explore the relationship among information sources, risk perception, demographics, and preparedness behaviors within the context of the social amplification of risk (Slovic 2000). The study analyzes a nationally representative sample of 1,023 U.S. respondents 18 years of age and older.
Social Amplification of the Risk of Terrorism

As a scientific concept, risk is defined as the likelihood or probability of an event taking place during an interval of time (Powers and Xie 2000). What can be especially difficult in promoting an understanding of risk to the public is the difference between a scientific risk and the public’s perception of that risk (Mileti and Fitzpatrick 1993, p. 13). Perceived risk is an outcome of the complex process of human interpretation that has been defined in the risk literature as the social amplification of risk. It is a process influenced by information sources, social and cultural values, beliefs, and attitudes (Douglas and Wildavsky 1982; R. Kasperson, Renn, Slovic, Brown, Emel, Goble, J. Kasperson and Ratick 1988; Renn, Burns, J. Kasperson, R. Kasperson and Slovic 1992).

Information Sources and Risk

Slovic (2000) argues that the news media play a critical role in the social amplification of risk when risks and disasters receive extensive coverage that results in an agenda-setting function (McCombs 1997). The extensive media coverage places the issue on the public’s agenda by amplifying risk perceptions and influencing the importance that people attribute to events and issues including disaster advisories (Brosius 1989; McCombs 1997; Mutz 1997). Through discussions with family, friends, and coworkers people interpret and give meaning to risks and events that then provide a basis for subsequent decisions and actions (Robinson and Levy 1986; Burkhart 1991; Morrow and Enarson 1996; McCombs 1997; O’Brien and Atchison 1998).

In general, the news media are the public’s primary source of advisories of impending threat or disaster (Drabek and Boggs 1968; Turner, Nigg and Paz 1986; Perry and Lindell 1989; Burkhart 1991) with television ranked first followed by newspapers, radio and social group networks (Turner et al. 1986). A more recent study reported that the most frequently relied upon mass media sources for hurricane advisories were local television and radio news followed by cable weather and CNN (Piotrowski and Armstrong 1998).

Preparedness Behavior

Motivating the public to respond to the threat of terrorism remains problematic because acts of terrorism as disaster events are by their very nature unpredictable because one primary goal of terrorists is to create
a climate of uncertainty (Hoffman 1998). Following the 2001 World Trade Center attack, the U.S. government established the U.S. Department of Homeland Security with the mission to mobilize and secure a nation at risk for future terrorist attacks. Because terrorist attacks on U.S. soil are a recent potential disaster, most knowledge about motivating preparedness must be developed from research examining response to natural and technological disasters.

In the social amplification of risk model tested by Renn et al. (1992), risk perception and information sources were related positively to willingness to take action to reduce risks. In a more recent study, Mileti and Darlington (1997) reported that the best predictor of preparedness behavior was information seeking from the news media and other people. People who believe that their preparations will reduce damage to human life and property (i.e., Bandura’s (1982) concept of self efficacy) are more likely to make preparations (Atwood and Major 2000). Paton, Smith, and Johnston (2000) reported a number of factors that can encourage or deter public action including (1) the belief that actions realistically will reduce the risk (i.e., expectancy outcome); (2) knowledge that adequate resources are available to take action (e.g., time and money); and (3) a sense of personal responsibility for reducing the risk (e.g., financial investment such as homeownership). Finally, in terms of gender and preparedness, studies have reported that women were more likely than men to engage in preparations in residential areas (Cutter, Tiefenbacher and Solecki 1992; Flynn, Slovic and Mertz 1994; Fothergill, 1996; Blanchard-Boehm 1997).

The Homeland Security Advisory System

The color-coded advisory system was designed to provide the public with a gauge of the potential risk of a terrorist attack. However, the system has been criticized for not providing the public with specific information about the time, location, and likelihood of the occurrence of potential threats (Zimbardo 2003). Even U.S. DHS Secretary Tom Ridge described the system as flawed and in need of revision (The Wall Street Journal 2003). Without specific references to the actual risk of an attack, the public is left to discern the differences among “guarded” Code Green, “elevated” Code Yellow, “high” Code Orange, and “severe” Code Red conditions, differences that are not easily distinguishable especially in terms of preparedness response.

In 2003, Zimbardo reported that a serious problem with the advisory system was that the DHS advisories had vacillated between
low-risk Code Green and high-risk Code Orange at least eight times following September 11, 2001. Within the timeframe of when the data were collected for the present study, the DHS advisory was raised to Code Orange (high-risk condition) on February 8, 2003, and subsequently was lowered to Code Yellow (elevated-risk condition) on April 16, 2003. Less than a month after these data were collected, the advisory was raised again to Code Orange on May 20. Despite the high-risk condition, DHS officials urged the American public to “continue with your plans for work and leisure” (U.S. Department of Homeland Security Web site).

The risk of a potential terrorist attack is further complicated by the government’s inability to reasonably specify the type of attack in advisories—chemical, biological, radiological or nuclear (CBRN)—which leaves the public with little information in terms of the requisite preparations to undertake (Advisory Panel 1999) in view of the fact that different weapons require quite different preparations. To gain a clearer understanding of the social amplification of risk within the context of the threat of terrorism and given the apparent shortcomings of the security alert system and the continuing news media attention to reports of terrorist threats, this study was designed to explore the following four research questions:

**RQ1.** Do respondents view the information sources of news media and conversations as collective or independent influences on their perceptions of the importance of the problem of terrorism?

**RQ2.** If the news media influence perceptions of the importance of the terrorism problem, (a) which news media sources are associated with influence; and (b) which respondents demographically are associated with news media influence?

**RQ3.** What are the (a) belief, (b) media use, and (c) demographic characteristics that differentiate respondents who believe that the U.S. Department of Homeland Security Advisory System is useful from those who believe the system is not useful in helping them prepare for a future attack?

**RQ4.** What do respondents who find the security advisory system useful compared with those who do not find it useful claim to have done to prepare for a future terrorist attack on the U.S. continent?

### Method

The data were collected via OmniTel, the weekly national omnibus survey of RoperASW. Interviews were conducted by telephone among
1,023 people 18 years-of-age and older from April 25-27, 2003 (RoperASW 2003). The margin of error for the entire sample is plus or minus three percentage points at the 95 percent confidence level. The margin of error at the subgroup level is higher depending on the number of cases in the subgroups analyzed.

To help assess the relative importance of news media and interpersonal discussions as information sources in the process of the social amplification of risk about perceived importance of the terrorism problem, a split-sample of the 1,023 respondents responded to two different initial questions. One group of 521 respondents was asked: “A recent story on CNN said that a terrorist attack on U.S. soil is likely in the next year. How likely do you think it is that terrorists will cause another major disaster in the U.S. in the next year”? The other 502 respondents were asked: “Many other people think that a terrorist attack on U.S. soil is likely in the next year. How likely do you think it is that terrorists will cause another major disaster in the U.S. in the next year”? Response alternatives included (4) extremely likely, (3) very likely, (2) not very likely, (1) not at all likely, and (9) don’t know.

The dependent (group) variable in the discriminant analysis is described in the paragraph that precedes the reporting of the analysis in the findings section below. This was done to facilitate the interpretation of the analysis. All but one of the questions included in the analysis as criterion variables are described in Table 4. The remaining predictor variable was created from the split-sample variable described above. The responses were combined into a dichotomous variable labeled “story version” representing the question they heard: (0) the CNN version (news media); or (1) the “many people” version. This provided a measure of perceived risk, that is, the likelihood that respondents believe an attack will occur in the next year.

To explore the preparations that respondents reported that they had made, the “not at all useful” and “not useful” response categories to the Homeland Security threat-advisory system were collapsed into “not useful,” and the “very useful” and “extremely useful” categories were collapsed into “useful” for cross-tabulation with the preparations variable because of small cell frequencies in the four-level response scheme.

**Findings**

One of the goals of the present analysis was to develop a better understanding of the factors that contribute to the process of the social amplification of risk within the context of threat of terrorism as a poten-
tial disaster. As past research has demonstrated, most people report that
the news media are the primary source of their information about threats
followed by conversations with other people. The following section
outlines the information sources that influenced people’s perceptions
of the importance of the terrorism problem.

**The Influence of Information Sources**

The first research question (RQ1) explored whether or not the news
media and conversations with other people collectively or independ-
ently influenced perceptions of the importance of the terrorism
problem.

**Table 1. Sources of Influence on Perceptions of the
Importance of Terrorism Problem.**

<table>
<thead>
<tr>
<th>Sources and news influence</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>__________________________</td>
<td>-----</td>
<td>---------</td>
</tr>
<tr>
<td><strong>Table 1(a). Source of influence</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>News media</td>
<td>323</td>
<td>33.5</td>
</tr>
<tr>
<td>Conversation</td>
<td>65</td>
<td>6.7</td>
</tr>
<tr>
<td>News and conversation</td>
<td>317</td>
<td>32.9</td>
</tr>
<tr>
<td>Neither news or conversation</td>
<td>259</td>
<td>26.9</td>
</tr>
</tbody>
</table>

**Table 1(b). Problem importance and news influence**

| Terrorism is an important problem and beliefs were influenced by the news. | 596 | 61.8 |
| Terrorism is an important problem but beliefs were not influenced by the news. | 244 | 25.3 |
| Terrorism is not an important problem and beliefs were influenced by the news. | 48  | 5.0  |
| Terrorism is not an important problem and beliefs were not influenced by the news. | 76  | 7.9  |
Table 1(c). TV news viewing and terrorism importance

| Watch tv news, terrorism is important | 764 | 79.3 |
| Watch tv news, terrorism not important | 101 | 10.5 |
| Not watch tv news, terrorism is important | 75  | 7.8  |
| Not watch tv news, terrorism not important | 24  | 2.5  |

Sources and news influence

<table>
<thead>
<tr>
<th>Sources and news influence</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local newspaper and terrorism importance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Read newspaper, terrorism is important</td>
<td>690</td>
<td>71.6</td>
</tr>
<tr>
<td>Read newspaper, terrorism not important</td>
<td>87</td>
<td>9.0</td>
</tr>
<tr>
<td>Not read newspaper, terrorism not important</td>
<td>148</td>
<td>15.4</td>
</tr>
<tr>
<td>Not read newspaper, terrorism not important</td>
<td>37</td>
<td>3.8</td>
</tr>
<tr>
<td>Radio news and terrorism importance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Listen to radio news, terrorism is important</td>
<td>382</td>
<td>55.0</td>
</tr>
<tr>
<td>Listen to radio news, terrorism not important</td>
<td>59</td>
<td>6.1</td>
</tr>
<tr>
<td>Not listen to radio news, terrorism important</td>
<td>309</td>
<td>32.1</td>
</tr>
<tr>
<td>Not listen to radio news, terrorism not important</td>
<td>64</td>
<td>6.7</td>
</tr>
<tr>
<td>Education and news influence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High school or less, influenced by news</td>
<td>370</td>
<td>33.2</td>
</tr>
<tr>
<td>High school or less, not influenced by news</td>
<td>125</td>
<td>13.0</td>
</tr>
<tr>
<td>More than high school, influenced by news</td>
<td>324</td>
<td>33.6</td>
</tr>
<tr>
<td>More than high school, not influenced by news</td>
<td>195</td>
<td>20.2</td>
</tr>
<tr>
<td>Age and news influence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 45 years, influenced by news</td>
<td>149</td>
<td>15.4</td>
</tr>
<tr>
<td>Less than 45 years, not influenced by news</td>
<td>369</td>
<td>39.3</td>
</tr>
<tr>
<td>45 years and older, influenced by news</td>
<td>271</td>
<td>28.1</td>
</tr>
<tr>
<td>45 years and older, not influenced by news</td>
<td>120</td>
<td>12.4</td>
</tr>
</tbody>
</table>
Home ownership and news influence

| Home owner, influenced by news | 417 | 44.4 |
| Home owner, not influenced by news | 233 | 25.0 |
| Not home owner, influenced by news | 207 | 22.2 |
| Not home owner, not influenced by news | 75 | 8.0 |

One third of the respondents (33.5%) reported that only the news media had influenced their beliefs about the importance of the terrorism problem. The proportions are presented in Table 1(a). Another 32.9 percent reported being influenced by both the news media and conversations with other people, and just 6.7 percent said their views of the importance of the terrorism problem had been influenced only by their conversations with others. Just over one-fourth (26.9%) said they were not influenced by either the news media or discussions with other people. Clearly, the data provide support for the influence of information sources on the social amplification of risk for the majority (73.1%) of the respondents.

Nearly nine respondents in ten (87.1%) said terrorism was a “very important” or “extremely important” problem, and 12.9 percent said it was “not very important” or “not at all important”. Of those who said it was an important problem, 61.8 percent said their views had been influenced by the news media (Table 1b) whereas 25.3 percent said their beliefs had not been influenced by the news. Of the respondents who said terrorism was not an important problem, 5.0 percent said their beliefs had been influenced by the news media and 7.9 percent said the news had not influenced their views.

Problem Importance, News Media Use and Respondent Demographics

If people say they have been influenced by the news, it raises the question of which news media were the contributing sources. The second research question (RQ2) explored (a) which news media sources were associated with influence; and (b) which respondents demographically were associated with news media influence? In this analysis, television, radio, and local newspapers were associated with perceived importance of the terrorist problem. News from the Internet and business publications was not related to influence. The contributions of the individual news media and demographics are presented in Table 1(c).
**News Media.** Nearly eight in 10 of the respondents (79.3 percent) said they had watched news about terrorism on television and that terrorism was an important problem. Seven in 10 respondents (71.6 percent) reported reading about terrorism in their local newspaper and thinking that terrorism was an important problem. Just over half (55.0 percent) of the respondents reported that they had heard news about terrorism on the radio and that they considered terrorism an important problem.

**Demographics.** Just three of the seven demographic characteristics tested—age, education, home ownership—were related to belief in the influence of the news media. Gender, full-time employment, income, and ethnic status were unrelated to perceived influence in this analysis.

Nearly four respondents in 10 (38.3 percent) were both younger than 45 years of age and believed they had been influenced by the news compared with 28.1 percent that were 45 years or older and believed their beliefs about terrorism had been influenced by the news. One-third of the respondents (33.2 percent) had a high school education or less and believed they had been influenced by the news and a similar proportion (33.6 percent) had at least some education beyond the 12th grade and also believed their views had been influenced by the news.

More than four in 10 of the respondents (44.7 percent) were homeowners who believed that the news had influenced their views about terrorism compared with only 8.0 percent who were not homeowners and did not believe their beliefs had been influenced by the news.

**Perceived Usefulness of the Advisory System**

The third research question (RQ3) explored how multiple variables in the social amplification of risk model were related simultaneously. Discriminant analysis provided an opportunity to differentiate among four groups of respondents based on their evaluations of the usefulness of the advisory system. The four groups were created from the question “The U.S. Department of Homeland Security has developed an Advisory System of color alerts to warn Americans about the risk of terrorist activity. How useful do you think that the information about the alert system is in helping you prepare for a possible terrorist attack? Is it (4) extremely useful, (3) very useful, (2), not very useful, or (1) not at all useful.” The group scores simply represented the respondents’ responses to the question.
Table 2. Summary of Canonical Discriminant Functions.

<table>
<thead>
<tr>
<th>Function</th>
<th>Eigenvalue</th>
<th>Percent Variance</th>
<th>Cumulative Variance</th>
<th>Canonical Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.213</td>
<td>68.1</td>
<td>68.1</td>
<td>.419</td>
</tr>
<tr>
<td>2</td>
<td>.068</td>
<td>21.8</td>
<td>90.0</td>
<td>.253</td>
</tr>
<tr>
<td>3</td>
<td>.031</td>
<td>10.0</td>
<td>100.0</td>
<td>.174</td>
</tr>
</tbody>
</table>

Test of Wilks' Lambda

<table>
<thead>
<tr>
<th>Test of Function(s)</th>
<th>Wilks' Lambda</th>
<th>Chi Square</th>
<th>df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 through 3</td>
<td>.748</td>
<td>227.382</td>
<td>45</td>
<td>.000</td>
</tr>
<tr>
<td>2 through 3</td>
<td>.908</td>
<td>75.966</td>
<td>28</td>
<td>.000</td>
</tr>
<tr>
<td>3</td>
<td>.970</td>
<td>24.160</td>
<td>13</td>
<td>.030</td>
</tr>
</tbody>
</table>

Eleven of the 15 predictor variables including (a) beliefs, (b) information sources, and (c) demographics were correlated 0.25 or greater with one or more of the three significant discriminant functions obtained and are included in the interpretation. The 0.25 inclusion criterion was selected because correlations of less than 0.25 would account for less than 6.25% of the variance in the analysis (Klecka 1980). The questions measuring all 15 predictor variables and their correlations with the functions are presented in Table 4. The response scales were Likert-type scales. The mean scores for the predictor variables are presented in Table 5. Three significant discriminant functions were obtained in the analysis and the statistics associated with the functions are presented in Tables 2 and 3.

Function 1. The third research question (RQ3) explored the (a) belief, (b) media use, and (c) demographic characteristics that differentiated respondents who believed that the U.S. Department of Homeland Security Advisory System was useful from those who believed the system was not useful in helping them prepare for a future terrorist attack? The social amplification of risk model outlines positive relationships among information sources, risk perception, and societal impacts such as government policy changes (Renn et al. 1992).
Table 3. Functions at Group Centroids.

<table>
<thead>
<tr>
<th>Group</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>1. Not at all useful</td>
<td>-.776</td>
</tr>
<tr>
<td>2. Not very useful</td>
<td>-.201</td>
</tr>
<tr>
<td>3. Very useful</td>
<td>.260</td>
</tr>
<tr>
<td>4. Extremely useful</td>
<td>.691</td>
</tr>
</tbody>
</table>

* Underscored values in each column represent the two groups most clearly separated by the predictor variables.

The analysis that follows provides support for those relationships. Respondents, who believed the advisory system was “extremely useful,” also believed that their conversations with other people (0.433) and the news media (0.405) had influenced how important that they believed the terrorism problem was.

In addition to the role of information sources in the social amplification process, respondents who believed that the advisory system “was extremely useful” were more likely to believe in the importance of the U.S. government taking action to reduce the threat of terrorism ($r = 0.687$) and that other people shared that belief ($r = 0.349$) than were respondents who said the advisory system was “not at all useful.” The social amplification process appears to have heightened beliefs in the importance of government action and responsibility.

For demographic variables, respondents who believed the advisory system was “extremely useful” were more likely to be women ($r = 0.272$) and have a high school education or less ($r = -0.475$) than were those who viewed the system as “not at all useful.” This supports previous disaster findings that women generally are more likely to be concerned about threats than men. (Cutter et al. 1992; Flynn et al. 1994; Fothergill 1996; Blanchard-Boehm 1997).
Table 4. Correlations Between Predictor Variables and Discriminant Functions.

<table>
<thead>
<tr>
<th>Predictor Variable</th>
<th>Function 1</th>
<th>Function 2</th>
<th>Function 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Importance to the respondent of reducing the threat of terrorism</td>
<td>.687*p</td>
<td>.302</td>
<td>-.008</td>
</tr>
<tr>
<td>Education (more than high school)</td>
<td>-.475</td>
<td>.388</td>
<td>-.253</td>
</tr>
<tr>
<td>Perceived influence of conversations on importance to respondent of reducing the threat of terrorism</td>
<td>.433</td>
<td>-.080</td>
<td>.112</td>
</tr>
<tr>
<td>Perceived influence of news media on importance to respondent of reducing the threat of terrorism</td>
<td>.405</td>
<td>.015</td>
<td>-.045</td>
</tr>
<tr>
<td>Gender (female)</td>
<td>.272</td>
<td>.010</td>
<td>-.073</td>
</tr>
<tr>
<td>Perceived importance to others of reducing the threat of terrorism</td>
<td>.349</td>
<td>-.442</td>
<td>.050</td>
</tr>
<tr>
<td>Employed full-time</td>
<td>-.166</td>
<td>.272</td>
<td>-.152</td>
</tr>
<tr>
<td>Watch TV news 2-3 times a week</td>
<td>.151</td>
<td>.232</td>
<td>-.127</td>
</tr>
<tr>
<td>Marital status (married)</td>
<td>.178</td>
<td>.208</td>
<td>.083</td>
</tr>
<tr>
<td>Home owner</td>
<td>-.029</td>
<td>.489</td>
<td>.533</td>
</tr>
<tr>
<td>Activity</td>
<td>Pearson Correlation</td>
<td>Kendall Correlation</td>
<td>Spearman Correlation</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>---------------------</td>
<td>---------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>Read national newspaper 2-3 times a week.</td>
<td>-.060</td>
<td>.004</td>
<td>.500</td>
</tr>
<tr>
<td>Story version (other people)</td>
<td>.158</td>
<td>.209</td>
<td>-.300</td>
</tr>
<tr>
<td>Household income over $50,000.</td>
<td>-.128</td>
<td>.037</td>
<td>.261</td>
</tr>
<tr>
<td>Listen to radio news 2-3 times a week.</td>
<td>.148</td>
<td>-.052</td>
<td>-.196</td>
</tr>
<tr>
<td>Read local newspaper 2-3 times a week.</td>
<td>-.049</td>
<td>.151</td>
<td>.166</td>
</tr>
</tbody>
</table>

*Function 1* separates respondents who believed the color-coded advisory system was “extremely useful” (positive association with the function) from those who believe the system is “not useful at all” (negative association with the function).

*Function 2* separates respondents who believed the advisory system was “extremely useful” (negative association with the function) from those who believed the system was “not very useful” (positive association with the function).

*Function 3* separates respondents who believed the advisory system was “very useful” (positive association with the function) from those who believed the system was “not very useful” (negative association with the function).

b Underscored correlations are included in the interpretation of findings.

**Function 2.** In contrast with the first function, respondents who believed the advisory system was “not very useful” in helping prepare for a terrorist attack were more likely to be homeowners \((r = 0.489)\), to be employed full-time \((r = 0.272)\), and have more than a high school education \((r = 0.388)\) than were those who reported that the system was “extremely useful.”
Table 5. Mean Scores for All Predictor Variables for the Four Homeland Question Response Groups.

<table>
<thead>
<tr>
<th>Predictor Variable</th>
<th>Group means</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Cases</td>
<td>Not at all Useful</td>
<td>Not Very Useful</td>
<td>Very Useful</td>
<td>Extremely Useful</td>
</tr>
<tr>
<td>1. Importance to respondent of reducing the threat of terrorism.</td>
<td>3.22</td>
<td>2.81</td>
<td>3.22</td>
<td>3.44</td>
<td>3.53</td>
</tr>
<tr>
<td>2. Perceived influence of conversations on importance to respondent of reducing the threat of terrorism.</td>
<td>2.33</td>
<td>2.05</td>
<td>2.21</td>
<td>2.45</td>
<td>2.63</td>
</tr>
<tr>
<td>3. Perceived influence of news media on importance to respondent of reducing the threat of terrorism.</td>
<td>2.90</td>
<td>2.56</td>
<td>2.85</td>
<td>3.00</td>
<td>3.13</td>
</tr>
<tr>
<td>4. Perceived importance to others of reducing the threat of terrorism.</td>
<td>3.29</td>
<td>3.21</td>
<td>3.17</td>
<td>3.31</td>
<td>3.58</td>
</tr>
<tr>
<td>5. Watch TV news two or three times a week.</td>
<td>0.91</td>
<td>0.84</td>
<td>0.92</td>
<td>0.92</td>
<td>0.91</td>
</tr>
<tr>
<td>6. Story version (Other people)</td>
<td>0.52</td>
<td>0.41</td>
<td>0.56</td>
<td>0.53</td>
<td>0.55</td>
</tr>
<tr>
<td>7. Listen to radio news two or three times a week.</td>
<td>0.62</td>
<td>0.56</td>
<td>0.62</td>
<td>0.61</td>
<td>0.69</td>
</tr>
<tr>
<td>8. Read local newspaper two or three times a week.</td>
<td>0.82</td>
<td>0.82</td>
<td>0.82</td>
<td>0.84</td>
<td>0.77</td>
</tr>
</tbody>
</table>
In terms of social amplification of the importance of government responsibility in countering terrorism, those who believed that the advisory system was “not very useful” were more likely to be associated with the importance of the U.S. government taking action to reduce the threat of terrorism ($r = 0.302$) than were those who believed the system to be “extremely useful.” However, those who believed that the system was “extremely useful” were associated with believing that most other people believed that government should reduce terrorism ($r = -0.442$).

**Function 3.** For the third function, respondents who believed that the advisory system was “very useful” were associated with homeownership ($r = 0.533$) and an annual household income greater than $50,000 ($r = 0.261$), whereas respondents who reported that the advisory system was “not very useful” were associated with more than a high school education ($r = -0.253$). In terms of media use, reading a national newspaper several times each week ($r = 0.500$) was associated with those who reported that the advisory system was “very useful.”

One of the goals of the study was to explore the influence of information sources on the perception of the risk of a potential terrorist

<table>
<thead>
<tr>
<th>Variable</th>
<th>0.32</th>
<th>0.37</th>
<th>0.28</th>
<th>0.36</th>
<th>0.27</th>
</tr>
</thead>
<tbody>
<tr>
<td>Read national newspaper two or three times a week.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender (female)</td>
<td>0.52</td>
<td>0.41</td>
<td>0.50</td>
<td>0.55</td>
<td>0.62</td>
</tr>
<tr>
<td>Home owner</td>
<td>0.69</td>
<td>0.65</td>
<td></td>
<td>0.69</td>
<td>0.77</td>
</tr>
<tr>
<td>Education (more than high school)</td>
<td>0.54</td>
<td>0.65</td>
<td></td>
<td>0.65</td>
<td>0.49</td>
</tr>
<tr>
<td>Marital status</td>
<td>0.55</td>
<td>0.46</td>
<td>0.55</td>
<td>0.60</td>
<td>0.57</td>
</tr>
<tr>
<td>Employment status (full-time)</td>
<td>0.51</td>
<td>0.52</td>
<td>0.56</td>
<td></td>
<td>0.40</td>
</tr>
<tr>
<td>Household income (over $50,000)</td>
<td>0.46</td>
<td>0.52</td>
<td>0.45</td>
<td></td>
<td>0.39</td>
</tr>
</tbody>
</table>

* Variables that define Function 1.
* Variables that define Function 2.
* Variables that define Function 3.
attack. To do this, a split-sample question was included in the survey design. Of the 1,023 respondents, 521 were asked to report the likelihood that they attributed to a terrorist attack on U.S. soil in the next year based on a CNN news story as a source compared with the belief that most other people in the U.S. believe that there will be another attack. This question provided the opportunity to examine the difference between “most other people” compared with a “CNN news story” as a variable influencing the social amplification of risk. For the third function, it was the CNN version (i.e., the news media) of the split-sample question that was associated with the belief that another attack was likely to occur in the next year. However, these same respondents also believed that the advisory system was “not very useful.” Here perceived risk was not associated with perceived usefulness of the advisory system.

System Usefulness and Preparations for a Terrorist Attack

The fourth research question (RQ4) explored the differences in reported preparations for a possible terrorist attack undertaken by respondents who found the U.S. Department of Homeland Security’s Advisory System useful in helping them to prepare for an attack compared with those who did not. The data are presented in Table 6. Despite the fact that the mean response score of the 1,023 respondents to the question about the importance of the terrorism problem was 3.44 on a scale of one to four, few respondents reported taking specific action. As is often the case with an ambiguous threat (e.g., earthquakes, building collapses, or nuclear reactor meltdowns), very few respondents actually undertook preparations to respond to the potential risk especially among those who did not believe that the advisory system was useful.

Of those who said the advisory system was “not useful,” 342 (72 percent) compared with 230 (47.1 percent) of those reported that the advisory system was “useful,” reported having made no preparations ($\chi^2 = 64.32$, df = 1, $p < .000$). There are statistically significant differences between the “not useful” and “useful” groups on six of the eight preparatory actions (See Table 6). The largest number of respondents (250) said they handled “mail more carefully” than they had in the past; three times as many of those who said the alert system was “useful” claimed to be more careful with their mail (n = 188, 38.5%) compared with only 62 (13.2%) of those who said the system was “not useful” ($\chi^2 = 78.36$, df = 1, $p < .000$). There were 132 respondents who said they had cancelled travel because of the threat of terrorism; 50 (10.6%) con-
Table 6. Responses to the Threat of Terrorism.

<table>
<thead>
<tr>
<th>Did Respondent:</th>
<th>Freq.</th>
<th>%</th>
<th>Freq.</th>
<th>%</th>
<th>Chi Square</th>
<th>df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchased a gun</td>
<td>no</td>
<td>458</td>
<td>97.4</td>
<td></td>
<td>465</td>
<td>95.3</td>
<td>2.589</td>
</tr>
<tr>
<td></td>
<td>yes</td>
<td>12</td>
<td>2.6</td>
<td></td>
<td>23</td>
<td>4.7</td>
<td></td>
</tr>
<tr>
<td>Cancelled travel plans</td>
<td>no</td>
<td>420</td>
<td>89.4</td>
<td></td>
<td>406</td>
<td>83.2</td>
<td>7.149</td>
</tr>
<tr>
<td></td>
<td>yes</td>
<td>50</td>
<td>10.6</td>
<td></td>
<td>82</td>
<td>16.8</td>
<td></td>
</tr>
<tr>
<td>Purchased an alarm system</td>
<td>no</td>
<td>463</td>
<td>98.5</td>
<td></td>
<td>447</td>
<td>91.6</td>
<td>22.605</td>
</tr>
<tr>
<td></td>
<td>yes</td>
<td>7</td>
<td>1.5</td>
<td></td>
<td>41</td>
<td>8.4</td>
<td></td>
</tr>
<tr>
<td>Handle mail more carefully</td>
<td>no</td>
<td>408</td>
<td>86.8</td>
<td></td>
<td>300</td>
<td>61.5</td>
<td>78.360</td>
</tr>
<tr>
<td></td>
<td>yes</td>
<td>62</td>
<td>13.2</td>
<td></td>
<td>188</td>
<td>38.5</td>
<td></td>
</tr>
<tr>
<td>Become more aware of terrorism</td>
<td>no</td>
<td>454</td>
<td>96.6</td>
<td></td>
<td>457</td>
<td>93.6</td>
<td>5.851</td>
</tr>
<tr>
<td></td>
<td>yes</td>
<td>16</td>
<td>3.4</td>
<td></td>
<td>31</td>
<td>6.4</td>
<td></td>
</tr>
<tr>
<td>Stored water</td>
<td>no</td>
<td>462</td>
<td>98.1</td>
<td></td>
<td>481</td>
<td>98.6</td>
<td>0.105</td>
</tr>
<tr>
<td></td>
<td>yes</td>
<td>9</td>
<td>1.9</td>
<td></td>
<td>7</td>
<td>1.4</td>
<td></td>
</tr>
<tr>
<td>Something else</td>
<td>no</td>
<td>459</td>
<td>97.7</td>
<td></td>
<td>473</td>
<td>96.9</td>
<td>0.249</td>
</tr>
<tr>
<td></td>
<td>yes</td>
<td>11</td>
<td>2.3</td>
<td></td>
<td>15</td>
<td>3.1</td>
<td></td>
</tr>
<tr>
<td>Nothing</td>
<td>no</td>
<td>128</td>
<td>27.2</td>
<td></td>
<td>258</td>
<td>52.9</td>
<td>64.336</td>
</tr>
<tr>
<td></td>
<td>yes</td>
<td>342</td>
<td>72.8</td>
<td></td>
<td>230</td>
<td>47.1</td>
<td></td>
</tr>
</tbody>
</table>

Considered the advisory system “not useful,” whereas 82 (16.8 percent) had said they thought it was “useful” ($\chi^2 = 7.15$, df = 1, $p = .007$).
Only 48 respondents said they had purchased an alarm system, just seven (1.5 percent) who thought the alert system was “not useful” compared with 41 (8.4 percent) who thought it “useful” ($\chi^2 = 22.61$, df = 1, $p < .000$). Of the 47 respondents who said they had become more aware of terrorism, 16 (3.4 percent) reported they thought the advisory system was “not useful” compared with 31 (6.4 percent) who said it was “useful” ($\chi^2 = 5.85$, df = 1, $p = .05$). Thirty-five respondents said they had purchased a gun. Of the gun purchasers, 12 (2.6 percent) said they thought the advisory system was “not useful,” whereas 23 (4.7 percent) said they thought it “useful,” ($\chi^2 = 2.59$, df = 1, $p = .018$).

**Discussion**

One of the greatest obstacles confronting the efforts of the U.S. Department of Homeland Security in preparing and mobilizing the American public for future terrorist attacks is the fact that terrorist attacks by their very nature are unpredictable. The ambiguity of the risk makes the task of providing the public with adequate information to encourage preparedness behaviors a formidable task. The DHS color-coded advisory system was developed in an effort to reduce uncertainty and provide American citizens with information enabling them to respond in the event of a disaster.

Based on the random sample of adult Americans in this study, half of the respondents (48.8%) rated the advisory system as useful and half (47.0%) rated it as not useful. That nearly half of the respondents rated the advisory system as useful given that it had only been launched the previous year might be interpreted as a success. However, simple proportions do not yield much insight into the meaning of those evaluations, a situation that discriminant analysis makes clearer.

When compared with men with some college or a college degree, who rated the advisory system as “not useful at all,” women with a high school education or less rated the color-coded advisory system as “extremely useful” in helping prepare for an attack. Women also were more likely to report that their belief in the importance of the terrorism problem was influenced by news media reports and conversations with other people, and that government action was needed to reduce the risk of terrorism. Information sources appear to have heightened women’s perceptions of the importance of the terrorism problem and the need for government responsibility, a societal impact that is specified as an outcome in the social amplification process.

Employed homeowners with some college education or a college degree judged the advisory system as “not very useful” compared with
renters with a high school education or less, who judged the system as “extremely useful.” Thus, with a threat advisory system that was seen as “not very useful,” respondents with a financial investment in a home and more education believed that the government needed to take action to reduce the threat of terrorism. In contrast, renters with less education may have viewed the advisory system as a positive outcome of the government’s efforts to improve the situation.

A second profile of homeowners earning an annual income of $50,000 or more with some college or a college degree rated the advisory system as “very useful” in contrast with renters earning less than $50,000 annually and rating the system as “not very useful.” Homeowners also reported reading a national newspaper two or more times weekly. It was house and apartment renters with less personal financial investment, however, who expressed a higher level of concern that another terrorist attack would occur in the next year. The advisory system was not regarded as “very useful” for respondents with fewer financial resources and a lower sense of personal responsibility for taking action (Paton et al. 2000). Nevertheless, these same respondents were associated with a greater concern about the risk of a future attack. This study departs from previous studies in that perceived risk was not heightened by information sources as is outlined in the social amplification model.

However, the study’s findings do provide strong support for the social amplification of risk model (Renn et al. 1992; Slovic 2000) in view of the fact that nearly nine in ten respondents (87.1%) reported that terrorism was an important problem and that two-thirds of those respondents reported that news reports about terrorist threats had influenced how important they believed the problem of terrorism was. Although the reported data are correlational and not causal, the logic of the relationships and the patterns of outcomes yield a reasonable interpretation that for many people the news media did amplify public perceptions of the importance of the terrorism problem.

Nearly three-fourths (73.1%) of the respondents reported that the news media, conversations with other people, or both information sources had influenced their perceptions of the importance of the terrorism problem. That some respondents were influenced by both media and discussions whereas some respondents were influenced by media only or conversations only provides evidence that the news media and interpersonal communication do not function independently as was originally assumed in early risk research (Tyler and Cook 1984). The present findings demonstrate that information sources operate both col-
lectively and independently for some respondents and for a small proportion of respondents information sources appear to be of little consequence.

Although information sources serve an important role in the process of the social amplification of risk, over one fourth (26.9%) of the respondents reported that they were not influenced by the news media or discussions with other people, and one in ten (12.9%) respondents did not believe that terrorism was an important problem, certainly not inconsequential proportions given the size of the U.S. population. Due to the prohibitive costs of survey research, the number of questions asked of respondents was limited and the data are not available to determine whether or not respondents were accurate in their assessments about the role of information influence. Nevertheless, this is an important question for future studies.

One of the primary reasons for examining the process of the social amplification of risk is to determine factors that may encourage the public to engage in preparations that can reduce the loss of life and property. Half of the respondents rating the color-coded advisory system as useful reported making some preparations, and almost three-fourths of the respondents who said the system was not useful had not made any preparations for a future attack. It was the perceived utility of the advisory system, not the perceived risk, that had impacted whether or not respondents engaged in preparedness behaviors.

This study's findings provide substantial support for previous disaster research showing that even a public that is concerned about a potential disaster does little to prepare especially when the disaster is not clearly defined in terms of the nature of the threat, the specific time-frame for the threat’s occurrence, the likelihood of the occurrence of the threat, and the actions necessary to reduce damage or harm from the threat.

Threats of terrorist attacks, like those of earthquakes, are more likely to result in a serious false-alarm effect because the events either occur or do not occur, and if the events do not occur, there is no residual evidence that there was a possibility of occurrence as may be the case with a hurricane reaching land. What complicates the situation further is that the DHS advisory system has vacillated frequently since the September 11th attacks between low and high. The ambiguity of such announcements leaves the public with but one choice: not to prepare. That ambiguity also may be partly responsible for why only 49 percent of the respondents in this survey reported that the threat-advisory system was useful. What the findings do make clear is that people respond to
advisories in different ways, which underscores the importance of future attempts to map out the complexities of public response to threats.

Notes

1. The color-coded Security Advisory System provides five warning levels. Code green represents a low-risk condition for a terrorist attack, whereas Code blue signifies a guarded or general risk of a terrorist attack. The Code yellow advisory represents an elevated condition with a significant risk of a terrorist attack. Code orange alert signifies a high risk of terrorist attacks, and a Code red alert represents a severe condition or risk of a terrorist attack.

2. RoperASW noted that: “All interviews were conducted from four RoperASW sites: New York, NY; Alamogordo, NM; Rexburg, ID; and Stockton, CA. Each OMNITel study is based on a random digit dialing (RDD) probability sample of all telephone households in the continental United States. The RDD sampling system is totally computer based and provides an equal probability of selection for each and every telephone household. Thus, the sample represents telephone households with both listed and unlisted phones in their proper proportions. All sample numbers selected by this procedure are subject to an original and at least four follow-up attempts to complete an interview. All completed interviews are weighted to ensure accurate and reliable representation of the total population, 18 years and older.”

3. The “not at all useful” and “not useful” response categories to the Homeland Security threat-advisory system question were collapsed into “not useful,” and the “very useful” and “extremely useful” categories were collapsed into “useful” for cross-tabulation with the preparations variable because of small cell frequencies in the four-level response scheme.

Acknowledgements

Support for this research was provided by the Jimirro Center for the Study of Media Influence, College of Communications, The Pennsylvania State University.

References


