RESEARCH NOTE

PREDICTORS OF TERRORISM-RELATED AIR TRAVEL REDUCTIONS AND ASSOCIATED TOURISM IMPACTS

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This study observes the potential decrease in air travel as a result of terrorist attacks in relation to individuals’ sociodemographic variables and media usage. Drawing from a sample of 2,023 respondents in the 2008 General Social Survey data set, this study seeks to identify market segments that have been most significantly impacted by terrorism events since September 11, 2001. Data are analyzed through direct logistic regression, resulting in a statistically significant model, $\chi^2 (10, N = 685) = 25.40, p = 0.005$. Results show two significant predictors of a terrorist-based decision to reduce air travel: occupational prestige and gender. Conclusions reveal the sociodemographic profile defining the market segment that has reduced air travel because of terrorist activity. Finally, recommendations are provided for enhancing and delivering marketing advertisements to this market segment.

Key words: Terrorism; Tourism; Demographic market segmentation

Introduction

Terrorism and tourism—substantially different yet deeply intertwined. Terrorism affected every citizen in the US in one way or another on September 11, 2001 and in more recent terrorism events and regulations (Silver, Holman, Poulin, & Gil-Rivas, 2002), such as the latest requirement for full body security scans in airports.

An understanding of the tourists most impacted by terrorism who are likely to reduce their tourism-related activities will be beneficial for the tourism industry to better understand and target this terrorism-fearing market segment. This study seeks to answer the question: What impact do sociodemographic variables and media usage have on a person’s decision to reduce air travel as a result of terrorist activity since September 11, 2001?

Literature Review

Countries have experienced a decline in tourism as a result of terrorist activity (Enders & Sandler, 1991; Frey, Luechinger, & Stutzer, 2007; Ito &...
Lee, 2005). Additionally, the September 11th events provided an initial stepping stone to additional travel safety measures that continue to impact travelers around the globe (Ito & Lee, 2005). Possible sociodemographic and media usage variables affecting travel reductions include:

**Occupational Prestige.** Little research has assessed the effect of occupational prestige on terrorism-related behavioral changes. Income, a related variable, is found frequently in the literature to have no effect on a person’s anxiety toward terrorism-related events (Huddy, Feldman, Capelos, & Provost, 2002; Skitka, Bauman, & Mullen, 2004). Since income and occupational prestige are closely related through the umbrella of social class (Miller & Salkand, 2002), similar no-effect outcomes are expected.

**Education.** Those with lower educational attainment are found to have higher levels of fear and anxiety toward terrorism (Huddy, Feldman, & Cassese, 2007; Skitka et al., 2004), and are therefore more likely to reduce air travel in fear of future terrorist acts.

**Age.** Interestingly, research shows an inverse relationship between age and level of anxiety toward future terrorist activity (Huddy et al., 2007), with the exception of risk-taking teenagers (Steinberg, 2007). Possibly, this inverse relationship is a result of mature peoples’ realization that their risk of personal loss due to terrorism-related events is diminishing.

**Gender.** Females should be more likely to reduce air travel as a result of the terrorist attacks, based on findings in current research. Studies show that females are more likely than males to experience anxiety and fear toward terrorism (Huddy et al., 2007; Skitka et al., 2004).

**Television Viewing.** TV viewers were more significantly impacted by the September 11th terrorist events than newspaper readers (Rhine, Bennett, & Flickinger, 2002), thus increasing their likelihood of reducing air travel. Also, extended periods spent watching television are shown to result in higher anxiety (Shrum, Burroughs, & Rindfleisch, 2003).

**Religion.** Research suggests that the beliefs of religious people aid in coping with traumatic events, reducing the likelihood of experiencing post-terrorism anxiety (Dein, 2010; Shreve-Neiger & Edelstein, 2004). Therefore, people with strong religious beliefs should have lower anxiety levels and be less likely to reduce air travel as a result of terrorism.

**Ethnicity.** Recent research shows no significant differences in terrorism anxiety between ethnicities (Huddy et al., 2007). However, racial profiling where fly/no-fly decisions are made based upon one’s race (Muffler, 2006) results in frustration for people of Arab decent (Tehranian, 2009). Possibly, air travel reductions will be highest in Arab people because of their dislike for being racially profiled, despite other research showing nonsignificance.

**Newspaper Reading.** Slone, Shoshani, and Baumphagen-Katz (2008) identified that people who followed the news after the September 11th terrorist attacks experienced higher levels of posttraumatic stress symptoms. Contrarily, newspaper readers experienced less anxiety than frequent television viewers (Rhine et al., 2002). Due to inconclusive research, only a slight correlation between newspaper reading and terrorism-related air travel reductions is expected.

**Income.** No significant differences have been found in recent research observing the relationship between anxiety levels as a result of terrorism and income levels (Huddy et al., 2002; Skitka et al., 2004). It is expected that there will be no significant difference between individuals’ income levels and their desire to reduce air travel as a result of terrorism.

**Marital Status.** Past research indicates that a person’s marital status does not have a significant effect on anxiety levels in relation to terrorism (Huddy et al., 2002; Silver et al., 2002). As a result, no significant difference is expected between people with different marital statuses in relation to making terrorism-related air travel reductions.

Research shows that people most likely to reduce air travel as a result of terror events since September 11th exhibit lower levels of education, are younger in age (excluding teenagers), female, watch television for their primary source of news, and are nonreligious.

**Method**

Data are from the General Social Survey (GSS) 2008 data set, which contained 2,023 responses
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(National Opinion Research Center, 2009). The GSS observes demographics, behaviors, and attitudes, and it has been conducted with people over the age of 18 in the US since 1972 (National Opinion Research Center, 2009).

Results

The correlation matrix listing Pearson correlation coefficients and one-tailed significance values is presented in Table 1, reporting four significant predictors of decision to reduce air travel as a result of terrorist activity: occupational prestige ($r = 0.070$, $p < 0.01$), education ($r = 0.056$, $p < 0.05$), age ($r = 0.050$, $p < 0.05$), and femaleness ($r = 0.047$, $p < 0.05$). Of these predictors, the correlation for femaleness is the only one that follows suit with the literature.

Literature on occupational prestige shows no significant relationship with air travel reductions, while the correlation coefficient shows a strong relationship ($r = 0.070$). Education and air travel reductions are shown to have an inverse relationship in the literature (education increases, air travel reductions decrease) but have a positive relationship in this study (education increases, air travel reductions increase) ($r = 0.056$). Finally, literature on age and air travel reductions shows an inverse relationship, while this study shows a positive correlation (age increases, air travel reductions increase) ($r = 0.050$). These findings show areas for further study.

Direct logistic regression was performed to assess the impact of research-supported sociodemographic variables on the likelihood that respondents would reduce air travel as a result of terrorist events since September 11th. The full model containing all predictors is statistically significant, $\chi^2 (10, N = 685) = 25.40$, $p = 0.005$, indicating that the model is able to differentiate between respondents who reported and did not report air travel reductions as a result of the September 11th terrorist attacks. The model in its entirety correctly classifies 89.9% of cases.

Table 2 shows two independent variables that make a unique statistically significant contribution to the model (occupational prestige and gender). The strongest predictor of air travel reductions is occupational prestige, recording an odds ratio of 1.025. This indicates that respondents with higher occupational prestige scores are 1.025 times more likely to reduce air travel, controlling for all other factors. The odds ratio of 1.879 for gender indicates that females are 1.879 times more likely to reduce air travel, controlling for other factors.

Discussion and Conclusion

For tourism market researchers and practitioners alike, this study provides support for demographic market segmentation based on occupational prestige and gender when targeting consumers that have made terrorism-related air travel reductions. This study’s research question assessing sociodemographic differences in consumers reducing air travel has been answered through identification of a traveler segment with greater odds of being female and having higher occupational prestige. As an example, a police officer (prestige score of 59) is almost two times more likely than a cashier in a supermarket (prestige score of 33) to make air travel reductions (Nakao & Treas, 1990). This study also provides tourism market researchers with a base for further research in a field of increasing relevance with terrorism-fearing air tourists.

Surprisingly, previous research shows no expected difference between travelers of varying occupational prestige levels, but this study shows a significant difference. Findings show higher odds, both in logistic regression and correlation coefficients, of an individual reducing their air travel when they have greater occupational prestige scores. An increase in private plane use since 2001, specifically among the extremely wealthy, could explain the greater likelihood of reducing air travel for those with higher occupational prestige if the respondent had interpreted the air travel reduction question to pertain only to commercial air travel (Bennett, 2004). This would make an interesting topic for future research. It is also possible that people of lower occupational prestige fear terrorism yet did not travel before the September 11th terrorist attacks due to funding constraints and, similarly, do not travel following them. This could create an inaccurate picture that only those of higher occupational prestige reduce air travel because they are the only group that can afford travel. Future research is needed to test this hypothesis.

Following suit with findings from this study, past research shows females as more likely to expe-
Table 1  
Correlation Matrix for Terrorism-Related Air Travel Reduction Variables

<table>
<thead>
<tr>
<th></th>
<th>911R</th>
<th>OCPG</th>
<th>EDUC</th>
<th>AGE</th>
<th>FEM</th>
<th>TV</th>
<th>REL</th>
<th>NOWH</th>
<th>NEWS</th>
<th>INC</th>
<th>MAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>911R</td>
<td>0.070**</td>
<td>0.056*</td>
<td>0.050*</td>
<td>0.047*</td>
<td>0.042</td>
<td>0.012</td>
<td>−0.007</td>
<td>−0.012</td>
<td>0.026</td>
<td>−0.002</td>
<td></td>
</tr>
<tr>
<td>OCPG</td>
<td>−</td>
<td>0.533***</td>
<td>−</td>
<td>−0.038*</td>
<td>−0.005</td>
<td>−0.300***</td>
<td>−0.112***</td>
<td>−0.114***</td>
<td>0.098***</td>
<td>0.395***</td>
<td>0.100***</td>
</tr>
<tr>
<td>EDUC</td>
<td>0.056*</td>
<td>−</td>
<td>0.107***</td>
<td>0.062**</td>
<td>0.227***</td>
<td>0.005</td>
<td>0.007</td>
<td>−0.101***</td>
<td>0.070**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AGE</td>
<td>0.050*</td>
<td>0.011</td>
<td>−0.005</td>
<td>0.014</td>
<td>—</td>
<td>0.111***</td>
<td>0.114***</td>
<td>−0.480***</td>
<td>0.028</td>
<td>−0.051*</td>
<td>0.203***</td>
</tr>
<tr>
<td>FEM</td>
<td>0.047*</td>
<td>0.011</td>
<td>−0.005</td>
<td>0.014</td>
<td>—</td>
<td>0.111***</td>
<td>0.114***</td>
<td>−0.480***</td>
<td>0.028</td>
<td>−0.051*</td>
<td>0.203***</td>
</tr>
<tr>
<td>TV</td>
<td>0.042</td>
<td>−0.196***</td>
<td>−0.300***</td>
<td>0.107***</td>
<td>0.062**</td>
<td>0.227***</td>
<td>0.005</td>
<td>0.007</td>
<td>−0.101***</td>
<td>0.070**</td>
<td></td>
</tr>
<tr>
<td>REL</td>
<td>0.012</td>
<td>−0.035</td>
<td>−0.112***</td>
<td>−0.300***</td>
<td>0.107***</td>
<td>0.062**</td>
<td>0.227***</td>
<td>0.005</td>
<td>0.007</td>
<td>−0.101***</td>
<td>0.070**</td>
</tr>
<tr>
<td>NOWH</td>
<td>−0.007</td>
<td>0.087***</td>
<td>−0.114***</td>
<td>−0.185***</td>
<td>−0.300***</td>
<td>0.107***</td>
<td>0.062**</td>
<td>0.227***</td>
<td>0.005</td>
<td>0.007</td>
<td>−0.101***</td>
</tr>
<tr>
<td>NEWS</td>
<td>−0.012</td>
<td>0.100***</td>
<td>0.098***</td>
<td>0.202***</td>
<td>0.007</td>
<td>−0.480***</td>
<td>0.028</td>
<td>−0.032</td>
<td>−0.185***</td>
<td>0.070**</td>
<td></td>
</tr>
<tr>
<td>MAR</td>
<td>−0.002</td>
<td>0.100***</td>
<td>0.010</td>
<td>0.470***</td>
<td>0.070**</td>
<td>0.042</td>
<td>0.203***</td>
<td>0.077**</td>
<td>0.210***</td>
<td>−0.168***</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>0.10</td>
<td>43.77</td>
<td>13.56</td>
<td>47.71</td>
<td>0.54</td>
<td>0.49</td>
<td>21.24</td>
<td>0.23</td>
<td>0.19</td>
<td>6.21</td>
<td>0.44</td>
</tr>
<tr>
<td>SD</td>
<td>0.30</td>
<td>13.89</td>
<td>2.86</td>
<td>17.35</td>
<td>0.50</td>
<td>0.50</td>
<td>8.45</td>
<td>0.42</td>
<td>0.39</td>
<td>11.98</td>
<td>0.44</td>
</tr>
<tr>
<td>N</td>
<td>1339</td>
<td>1921</td>
<td>1995</td>
<td>2013</td>
<td>2023</td>
<td>1500</td>
<td>1962</td>
<td>2023</td>
<td>1500</td>
<td>1774</td>
<td>2018</td>
</tr>
</tbody>
</table>

911R = Dummy variable coded 1 to indicate air travel reductions since the terrorist attacks of 9/11, 0 otherwise; OCPG = Prestige of respondent’s occupation; EDUC = Education in years of respondent; AGE = Age in years of the respondent; FEM = Dummy variable coded 1 to indicate female, 0 otherwise; TV = Dummy variable coded 1 to indicate the respondent’s primary source of news is the television, 0 otherwise; REL = Index of religious values combing Likert-scale variables (Cronbach’s alpha = 0.711); ATTEND (how often respondent attends religious services), BIBLE (feelings about the bible), GOD (confidence in the existence of god), and PRAY (how often respondent prays) (Religion index min = 4 and max = 24); NOWH = Dummy variable coded 1 to indicate black or other non-white race, 0 otherwise; NEWS = Dummy variable coded 1 to indicate the respondent’s primary source of news is the newspaper, 0 otherwise; INC = Income of respondent, calculated from the midpoint of income categories; MAR = Dummy variable coded 1 to indicate married, divorced, widowed, or separated, 0 otherwise.

*Significant at p < 0.05, **significant at p < 0.01, ***significant at p < 0.001.
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Table 2

Binary Logistic Regression Estimates of Air Travel Reductions

<table>
<thead>
<tr>
<th>Variable</th>
<th>β</th>
<th>SE</th>
<th>Wald</th>
<th>Odds Ratio</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>OCPG</td>
<td>0.025*</td>
<td>0.011</td>
<td>5.336</td>
<td>1.004-1.047</td>
<td></td>
</tr>
<tr>
<td>EDUC</td>
<td>0.031</td>
<td>0.056</td>
<td>0.298</td>
<td>1.031-0.924</td>
<td></td>
</tr>
<tr>
<td>AGE</td>
<td>0.017</td>
<td>0.010</td>
<td>3.268</td>
<td>1.017-0.999</td>
<td></td>
</tr>
<tr>
<td>FEM</td>
<td>0.631*</td>
<td>0.280</td>
<td>5.080</td>
<td>1.086-3.252</td>
<td></td>
</tr>
<tr>
<td>TV</td>
<td>0.140</td>
<td>0.322</td>
<td>0.191</td>
<td>1.151-2.161</td>
<td></td>
</tr>
<tr>
<td>REL</td>
<td>0.020</td>
<td>0.026</td>
<td>0.612</td>
<td>1.020-1.074</td>
<td></td>
</tr>
<tr>
<td>NOWH</td>
<td>0.384</td>
<td>0.324</td>
<td>1.409</td>
<td>0.778-2.772</td>
<td></td>
</tr>
<tr>
<td>NEWS</td>
<td>-0.333</td>
<td>0.414</td>
<td>0.648</td>
<td>0.716-1.614</td>
<td></td>
</tr>
<tr>
<td>INC</td>
<td>0.093</td>
<td>0.153</td>
<td>0.366</td>
<td>0.813-1.481</td>
<td></td>
</tr>
<tr>
<td>MAR</td>
<td>-0.199</td>
<td>0.354</td>
<td>0.318</td>
<td>0.819-1.639</td>
<td></td>
</tr>
<tr>
<td>CONSTANT</td>
<td>-6.242</td>
<td>1.680</td>
<td>13.808</td>
<td>0.002</td>
<td></td>
</tr>
</tbody>
</table>

Standard errors in parentheses. See Table 1 for definitions of variables. N = 685. −2 Log likelihood = 422.156. Hosmer and Lemeshow = 9.661, p = 0.290. *Significant at p < 0.05.

experience higher levels of anxiety and make air travel reductions as a result of terrorist activity. The significance of gender and occupational prestige in this study’s model is an indication to travel and tourism companies to address the concerns of females and consumers with high occupational prestige levels in an effort to obtain new sources of revenue. Future research efforts should identify specific concerns these two significant groups have regarding travel, and then make suggestions for customized marketing plans that address these concerns.

Further research could assess differences between business and leisure travelers since business travelers usually have less choice in their travel plans compared to leisure travelers. Another topic for future research should address the locations where travel reductions are most frequently made, which would be especially beneficial to tourism employees marketing to these destinations. Additionally, further research should assess recent changes in the air travel industry and resulting changes in travel behavior, such as the new introduction of full body security scans.

As terrorist activity in the United States and throughout the world continues to rise, it is becoming increasingly important to understand the effects of terrorist acts on travel behavior. One step to better understanding travel behavior is properly defining the segment of travelers that are most significantly impacted by terrorist activity. This study found two sociodemographic variables (occupational prestige and gender) that have a statistically significant relationship with air travel reductions, thereby providing applications for researchers and practitioners alike.

References


