Gender, Residence, Past Experience and Communication in Tourist Hurricane Evacuation

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ABSTRACT

The paper discusses the role of gender, residence, and past experience with hurricanes in affecting tourists' voluntary evacuation in the event of hurricanes. Specifically the study examines how the aforesaid variables influence perceived credibility of the information source and how such perception is translated into actual information search behaviors leading to a voluntary evacuation decision. The paper is guided by utility maximization under environmental risks and bounded rationality. The findings indicate that the aforesaid variables significantly influence the perception of the credibility of information sources and information search behaviors leading to voluntary evacuation decisions. Implications of the findings are also discussed.

Keywords: *tourists, crisis, hurricane evacuation*

INTRODUCTION

In any natural disaster, individuals must make decisions based on information about risk probability in which warnings emanate from a variety of sources, such as the U.S Weather Service, media outlets, government officials, friends and relatives. Sources have a wide range of credibility, with friends and family often viewed as credible sources, while government agencies and media outlets seen as less credible, especially in recent years (Wes & Orr, 2007). Residents often do not perceive that the government cares about them (Eisenman et al, 2007). People also demonstrate concern about bias, inaccuracy, and unfairness in press coverage. They do not trust media outlets to give an accurate picture of what is happening or to be reliable in the communication of crucial information. In particular, women and minorities have been found to be less likely to trust established government and media sources than others (Wes, 2001), while males have greater tendency to utilize television as a primary information source (Bateman & Edwards, 2002). Nonetheless, scholars have focused on communication as a key to disaster response, with such information being crucial in the process of how people perceive threats and whether or not they decide to evacuate (Comfort, 2006; Whitehead et al, 2000; Rodriquez et al, 2004). Depending on one's past experiences with a disaster (Burnside et al, 2007), some sources may have a greater impact than others, with a perceived lack of credibility of certain sources contributing to an individual's reluctance to actually seek information (Sorensen & Sorensen, 2007). Unfortunately, little attention has been given to tourists' information management in the event of a disaster, especially those who are already in the destination when a disaster occurs (Drabek, 2000; Ritchie, 2009).

Tourists are a vulnerable group in the event of a disaster such as hurricanes due to the lack of requisite knowledge to decipher communication messages. Moreover, they are typically in unaccustomed places and lack support systems that would be accessible if they were at home (Matyas et al, 2011; Faulkner, 2001; Burby & Wagner, 1996; World Tourism Organization, 1998). Consequently, impacts of hurricane risks to tourists are often greater than those to the non-tourist residents in the event of hurricane evacuation. Given the variability in information consumption, it is pivotal to determine whom tourists listen to and what recommendations affect their perceptions of vulnerability and the way in which they make evacuation decisions. Therefore, this study is framed by four interrelated questions: (1) Is there any difference among gender, past experience and place of residence with regard to perceived credibility of information sources regarding hurricane evacuation? (2) Is there any difference among gender, past experience and place of residence in information search behavior regarding hurricane evacuation? (3) Is there any difference in perceived credibility and information search? (4) What role does information search play in predicting tourists' evacuation decisions?

LITERATURE REVIEW

This study is guided by Borton et al (1993) utility maximization under environmental risks and bounded rationality (Letson et al, 2007) which posit that individuals make choices under the uncertainty of threat by maximizing their expected utilities. Under bounded rationality, choices are viewed to be restricted such that individuals might be willing to forgo everything they have, to minimize the threats. Within the aforesaid scope, individual beliefs about the credibility of risk information sources have been found to affect individual preventive behaviors

(Kosicki & McLeod, 1990; Griffin et al, 1999; Slovic, 1993; Dash & Gladwin, 2007; Dow & Cutter, 1997). Driscoll and Salwen's (1996) study on hurricane Andrew found that residents ranked television first in terms of expertise, followed by radio, newspapers and peers. However, when the sources were ranked based on trustworthiness, television ranked first followed by radio, peers and newspapers. This suggests that for residents, television is regarded as having the highest level of trustworthiness in the event of hurricanes. In the context of tourists, little exploration has been done in this area. Prideaux et al (2007) in their study on Cyclone Larry found that domestic tourists have a higher perception of credibility of television than international tourists. Griffin et al (1998) argue that individual beliefs regarding credibility are not automatically translated into actual information seeking due to the availability of sources during a disaster, while other researchers such as Dillard et al (1996) and Kosicki and Mcleod (1990) argue that the discrepancy is attributed to political, social and cultural factors.

Additionally, past hurricane experience has also been found to influence information management. Those with past experience are more likely to know where to obtain accurate information than those without past hurricane experience (Gladwin & Peacock, 1997; Lehto, O'Leary & Morrison, 2004; Fodness & Murray, 1999; Kerstetter & Cho, 2004). Past literature has also found that gender is a factor that influences risk information management (Enarson, Fothergill & Peek, 2006; Bateman & Edward, 2002). West and Orr (2007) found that women from Rhode Island are more likely than men to report that media coverage, a government order, and a recommendation by a friend of relatives would make them evacuate. Residence also has been found to influence information search behaviors with those who are from the destination employing different strategies than those from outside the destination (Major, 1998; Gursoy & McLeary, 2004).

METHODOLOGY

The survey used an interception approach that was conducted in September 2011, during the Atlantic hurricane season. Participants for this study were tourists visiting the state of Florida. At each site, a random sample of tourists were intercepted and asked to complete a questionnaire. A screening question was conducted to identify eligible tourists. One adult from each travel party was approached. All surveys were self-administered and took approximately 15 minutes to complete. A total of 533 completed surveys were used for this study (response rate 87%).

Six variables were used for this study: (1) Perceived credibility was measured by asking respondents to rate the level of credibility of 13 information sources regarding hurricane information (family & friends, TV stations, social clubs, local tourism office, radio stations, social network sites, locals, weather channel, local authority, newspaper, National Hurricane Center [NHC], hotel staff and other tourists) with a 5-point Likert Scale with 1= *not credible at all* to 5= *very credible*; (2) Information search was measured by two questions (a) asking respondents where they turn to for information in the event of hurricane evacuation while they are vacationing in the destination, the options were 8 unique two-way communication sources (family & friends, locals, other tourists, local tourism office, local authority, social network sites, hotel staff and social clubs) (b) asking where they seek information in the event of hurricane evacuation while they are vacationing in the destination, the options was 5 unique one-way

communication sources (TV stations, radio stations, newspaper, NHC, Weather Channel). Each question was measured using a 5-point Likert scale with 1 = *never* to 5= *always*; (3) Gender was measured by asking respondents their gender; (4) Past experience was measured by asking respondents whether or not they have experienced hurricane impacts in the past; (5) Place of residence was measured by asking where the respondents reside (Florida, Domestic outside Florida or International); (6) Evacuation decision-making was measured by asking respondents about their likelihood to evacuate for each given scenario with 1=*very unlikely* to 5= very *likely*. There were 8 hurricane scenarios based on a combination on projected path (through- offset destination), projected category in the destination (category 1 & category 4), and time to destination (36 hours to 48 hours) used for this study. The data were analyzed using PSW 18 Statistical packages.

RESULTS

Across 533 completed surveys, females encompassed 54%, Caucasians 69%, individuals with no experience with hurricane encompassed 52%, with 50% having bachelor degrees, 17% domestic tourists, 49% domestic outside Florida and 34% international tourists. For research question 1, a MANOVA analysis was employed. The results (Table 1) indicated significant effects of gender (Wilks' lambda = .954, p=.028), place of residence (Wilks' lambda = .915, p=.01) and past hurricane experience (Wilks' lambda= .913, p=.00) on perceived credibility. No interaction effects were found to be significant. Test between subjects (Table 2) indicated that females perceived the following sources to have higher credibility than males: family and friends (p=.034), TV (p=.031), local tourism office (p=.032), Weather Channel (p=.005), newspaper (p=.003) and hotel staff (p=.033). Tukey HSD test indicated that place of residence significantly affects use of local tourism office (p=.029) and newspaper (p=.013) with international tourists holding these in higher regard in terms of their perception of credibility than others (Table 3). Past experience affected family and friends (p=.03), local tourism office (p=.00) and hotel staff (p=.00) with those with past experience with hurricane perceived higher credibility on family and friends while those without experiences perceived higher credibility on local tourism office and hotel staff (Table 4).

Table 1
Summary of MANOVA Analysis of Gender, Residence and Past Experience on Perceived Credibility

Effect	Wilks' Lambda	DF	F Statistic	Significance
Gender	.954	13	1.901	.028*
Residence	.915	26	1.781	.010*
Past experience	.913	13	3.724	.000*

Only significant effects are listed. * Sig at .05

Table 2
Test of Between-Subjects Effects of Gender on Perceived Credibility

Dependent Variables	Mean Score		DF	F	Sig.
	Male	Female		Statistic	
Family and Friends	2.675	2.922	1	4.516	.034*
Television	4.091	4.293	1	4.658	.031*
Local tourism office	3.279	3.548	1	4.606	.032*
Weather Channel	4.366	4.612	1	7.823	.005*
Newspaper	3.585	3.897	1	8.970	.003*
Hotel Staff	3.161	3.404	1	4.589	.033*

Only significant effects are listed. * Sig at .05

Table 3
Test of Between-Subjects Effects of Residence on Perceived Credibility

Dependent Variables	Mean Score			DF	F	Sig.
	Florida	Domestic	International		Statistic	
Local tourism office	3.143	3.504	3.594	2	3.578	.029*
Newspaper	3.775	3.576	3.872	2	4.389	.013*

Only significant effects are listed. *Sig. at .05

Table 4
Test of Between-Subjects Effects of Past Experience on Perceived Credibility

Dependent Variables	Mean Score		DF	F	Sig.
	No	Yes		Statistic	
Family and Friends	2.670	2.928	1	4.899	.027*
Local tourism office	3.639	3.189	1	12.881	.000*
Hotel Staff	3.546	3.019	1	21.639	.000*

Only significant effects are listed. * Sig at .05

For research question 2, a MANOVA was conducted for information search. Table 5 indicated there were significant effects of gender (Wilks' lambda=.944, p=.005), place of residence (Wilks' lambda=.916, p=.012) and past experience (Wilks lambda =.893, p=.00). No interaction was found to be significant. Table 6 indicated that females utilized family (p=.003), locals (p=.016), local tourism office (p=.004), local authority (p=.01), hotel staff (p=.00) and NHC (p=.022) more than males. International tourists used local tourism office (p=.011), local authority (p=.029), social network sites (p=.011), hotel staff (p=.003), newspapers (p=.015) more than other groups (Table 7). Likewise as indicated on Table 8 those without experience sought information from other tourists (p=.007), local tourism offices (p=.000), social network sites (p=.000) and hotel staff (p=.00) more than other groups while those with past hurricane experience utilized NHC more than those without experiences (p=.002).

Table 5
Summary of MANOVA Analysis of Gender, Residence and Past Experience on Information Search

Effect	Wilks' Lambda	DF	F Statistic	Significance
Gender	.944	13	2.342	.005*
Residence	.916	26	1.750	.012*
Past experience	.893	13	4.684	.000*

Only significant effects are listed. * Sig at .05

Table 6
Test of Between-Subjects Effects of Gender on Information Search

Dependent Variables	Mean Score		DF	F	Sig.
	Male	Female		Statistic	
Family and Friends	2.645	3.060	1	8.914	.003*
Locals	2.744	3.035	1	5.849	.016*
Local Tourism Office	2.827	3.233	1	8.177	.004*
Local Authority	3.968	4.260	1	6.640	.010*
Hotel Staff	3.161	3.676	1	15.530	.000*
National Hurricane Center	4.081	4.360	1	5.312	.022*

Only significant effects are listed. * Sig at .05

Table 7
Test of Between-Subjects Effects of Residence on Information Search

Dependent Variables	Mean Score			DF	F	Sig.
	Florida	Domestic	International		Statistic	
Local Tourism Office	2.683	3.154	3.254	2	4.522	.011*
Local Authority	3.875	4.178	4.289	2	3.577	.029*
Social Networks	2.185	2.624	2.788	2	4.519	.011*
Hotel Staff	3.052	3.551	3.651	2	5.904	.003*
Newspaper	2.793	2.993	3.283	2	4.265	.015*

Only significant effects are listed. *Sig. at .05

Table 8
Test of Between-Subjects Effects of Past Experience on Information Search

Dependent Variables	Mean Score		DF	F	Sig.
	No	Yes		Statistic	
Other tourists	2.130	1.828	1	7.403	.007*
Local tourism office	3.387	2.673	1	25.291	.000*
Social networks	2.764	2.267	1	13.290	.000*
Hotel staff	3.695	3.141	1	17.915	.000*
National Hurricane Center	4.036	4.405	1	9.272	.002*

Only significant effects are listed. * Sig at .05

For research question 3, a paired T-test was conducted between perceived credibility of information sources and information search. The results on table 9 indicated that a significant discrepancy existed between perceived credibility and their information search among 10 sources with a significant level of .001. Only family, The Weather Channel and other tourists were not different. The negative sign in the mean difference column indicated that the mean for a given information source with respect to information search was higher than the mean for the same

information source with respect to perceived credibility. Likewise, the positive sign indicated that the mean for a given information source with respect to perceived credibility was higher than the mean for the same information source with respect to information search.

Table 9
Summary of Paired T-test for Perceived Credibility and Information Search

Pair	Mean Difference	df	T Statistic	Sig.
Family and friends	-.111	532	-1.769	.077
Television	-.203	532	-4.480	.000*
Social group	.272	532	5.243	.000*
Local tourism office	.353	532	6.019	.000*
Weather Channel	-.009	532	-.227	.821
Local Authority	.197	532	4.185	.000*
Newspapers	.610	532	10.916	.000*
National Hurricane Center	.319	532	6.663	.000*
Hotel staff	-.201	532	-3.879	.000*
Radio	.326	532	6.196	.000*
Social networks	.195	532	3.745	.000*
Locals	.203	532	3.527	.000*
Other tourists	.073	532	1.408	.160

* Sig at .001

For research question 4, an Ordered-Probit Model (McKelvey & Zavonia, 1975) was employed to relate all variables to evacuation decisions. The Ordered-Probit Model recognized the inherent ordering in the outcome variables of interest and allowed for calculation of the probability of each level of outcome as a function of explanatory factors. In the model, a positive parameter indicated that the corresponding factor was associated with a higher likelihood of evacuation and a negative parameter indicated the opposite effect. Unlike logistic regression, the Ordered-Probit model did not produce odd ratios. The odd ratio from an Ordered-Probit Model was obtained by taking the exponent of the beta coefficient. The parameters of the model were estimated using the maximum likelihood estimator. Prior to estimating the model, the data set was converted from a person-based to a scenario-based data set to better reflect decisions based on hypothetical hurricane scenarios. The -2 Log likelihood at convergence was 4521.737 (χ^2 = 144.006, df=17, sig. .000) indicating a significant improvement from the baseline model. The model with all independent variables accounted for 35 percent of the variance in the evacuation likelihood. Table 10 outlines the result of the Ordered-Probit Model.

Tourists who utilized locals (β= -.089), hotel staff (β=-.188) and newspapers (β= -.093) were less likely to evacuate than their counterparts, while those who utilized local tourism office (β=.116) and local authority (β=.133) would be more likely to evacuate. Females (β=.462) were more likely to evacuate than males. International tourists (β=.991) and domestic tourists outside Florida (β=.832) were more likely to evacuate than those from Florida. Likewise those without past experience with hurricanes (β=.146) were more likely to evacuate than those with experiences.

Table 10
Results of the Ordered Probit Model

Variables	Parameter Estimate	Odd Ratio	Sig.
Information Source			
Family and friends	.039	1.039	.239
Television	.083	1.086	.165
Social group	.018	1.018	.717
Local tourism office	.116	1.123	.004*
Weather Channel	-.018	.982	.765
Local Authority	.133	1.142	.006*
Newspapers	-.093	.911	.020*
National Hurricane Center	.010	1.010	.814
Hotel staff	-.188	.828	.000*
Radio	.071	1.073	.111
Social networks	.012	1.012	.783
Locals	-.089	.915	.024*
Other tourists	-.008	.992	.873
Female (ref = Male)	.462	1.587	.000*
Without past experience (ref= with)	.146	1.157	.091
Place of Residence (ref = Florida)			
International	.991	2.693	.000*
Domestic	.832	2.298	.000*
Thresholds			
Evacuate = 1	-1.053	-	.000
Evacuate = 2	-.066	-	.785
Evacuate = 3	1.033	-	.000
Evacuate = 4	2.061	-	.000

-2 Log Likelihood at convergence (n=2137) = 4521.737 (χ^2 = 144.006, df=17, sig. .000)
Pseudo R^2 Negelkarke = .35
*Ref= reference group

DISCUSSION AND CONCLUSION

This study found that gender, place of residence and past experience had a significant influence on ones' perception of source credibility and information search leading to evacuation decision making in the event of hurricanes. These differences suggest that officials need to better understand how the aforesaid factors and communication methods affect tourists' voluntary evacuation decision making. The discrepancy between perceived credibility and information search indicated that despite their perception, tourists would use available sources and maximize the utility of them, in this case TV and hotel staff, that is parallel with utility maximization theory (Borton et al, 1993; Vescusi, 1995) and bounded rationality (Letson et al, 2007). Thus, unless officials build nuances into their hurricane communication and emergency planning they will not be successful with all kind of tourists.

The findings also illustrate the crucial role of hotel staff and local tourism offices (DMOs) in influencing evacuation decisions such that those who utilized hotel staff were more likely to remain in the destination while those who sought information from local tourism offices were more likely to evacuate. Therefore, emergency agencies and DMOs should collaborate more to provide tourists better information about what they need to do if a hurricane strikes.

Hotels need to have plans to better assist their guests, including shelter designations, refund policies and evacuation procedures to save lives. In addition, the finding also indicated that international tourists would use social networks more than domestic tourists or those who were from Florida. Therefore, it is important to inform international tourists as to which credible social networks they can follow to receive up to date information in timely manner regarding hurricanes (e.g. Visit Florida's *tweeter* page).

Lastly, as the study was conducted in Florida, further study needs to be replicated in other states that experience more severe (or less) hurricanes to help understand the complex interaction of the aforesaid variables that is crucial for hurricane preparedness. Additionally, future study should also need to be conducted during a non-hurricane season to ensure the stability of the model as well as to include other variables that may also influence hurricane evacuation decision making to fully predict the actual preventive behaviors when a hurricane is in the horizon.

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