Place attachment, recreational activities, and sustainability of tourism under changing climate conditions

Abstract

Globally, climate is changing and will likely alter where and when visitors decide to travel. This study looks at how visitors' attachment to Mount Desert Island (MDI), Maine, affects their intended future visitation under changing climate conditions, and thus the sustainability of MDI as a tourist destination under a changing climate. Additionally, the study explores how the recreational activities visitors participate in might impact their attachment to the destination. Visitors were identified on-site and asked to complete an online survey (n=416). Segmentation analysis was used to group visitors by their level of attachment to the destination: high (27%), medium (49%), and low (24%). Results indicate that those with a high level of place attachment participate in more recreational activities during their trip and tend to have more primary activities that are nature-based. Additionally, those with high attachment are less likely to be deterred from visiting MDI in the future under potentially negative changing environmental conditions. Results indicate that under changing conditions, visitors' place attachment influences future visitation intent. It is easier to retain visitors than attract new ones, so destinations (including gateway communities) would benefit from developing strategies that enhances visitor place attachment to capitalize on repeat visitation and increase long-term sustainability.

Keywords: sense of place; outdoor recreation; nature-based tourism; segmentation; weather

Introduction

At a global scale, climate is changing. By 2012, average land and ocean temperatures had already risen by 0.85°C from 1880, and there was an increase in extreme weather, such as heat waves, droughts, high precipitation events, and the frequency and intensity of hurricanes (IPCC, 2013). This is already impacting outdoor recreation and nature-based tourism by changing where and when people decide to travel (Gössling, Scott, Hall, Ceron, & Dubois, 2012). Additionally, climate is predicted to continue changing globally, which is expected to shift climate dependent tourism resources and thus influence flows of tourists (Berritella, Bigano, Roson, & Tol, 2006; Scott, McBoyle, & Schwartzentruber, 2004).

Although climate change will not likely alter overall global tourism demand, it is expected to impact what destinations people perceive to be attractive and where they travel (Berritella et al., 2006). This has the potential to greatly affect the economies in many areas that rely on tourism. In 2015, tourism accounted for 9.8% of global GDP and supported 1 in 11 jobs (World Travel & Tourism Council, 2016), so any local changes to tourism flows and expenditure could impact businesses and communities, both positively and negatively. For example, one study found that the ideal climate for tourism is likely to shift poleward with climate change, which would positively impact tourism visitation in northern latitudes, but negatively affect locations closer to the equator (Amelung, Nicholls, & Viner, 2007). Therefore, it is important to investigate how tourists' travel behavior could be modified under potential future changing climate conditions.

In addition to impacting tourism systems and destinations, climate change alters many other facets of society, including peoples' sense of place. For example, a recent study found that climate change negatively affects place attachment in Nunatsiavut, Canada, by changing

landscapes and disrupting traditional activities such as hunting and foraging (Willox et al., 2012). Further, research has shown that place attachment also impacts how people cope and adapt to climate change in their own communities (Amundsen, 2015), and is a predictor of how people engage with climate change (Scannell & Gifford, 2013).

Place Attachment

Spaces become places when people assign meaning and value to them (Tuan, 1977, p. 6). Place attachment describes how bonded people are to a particular location (Altman & Low, 1992), reflecting an individual's psychological locality (Scannell & Gifford, 2010) and emotional ties to a particular location (Manzo, 2005; Williams & Vaske, 2003). Place attachment is a multidimensional construct, with place identity and place dependence being the two traditional dimensions measured (Williams, Patterson, Roggenbuck, & Watson, 1992). Place identity is an emotional attachment to a place, whereas place dependence is a functional attachment (Williams & Vaske, 2003). In place identity, an individual perceives a connection between a particular place and their own personal identity, thus creating the emotional attachment (Prohansky, 1978; Stedman, 2002). On the other hand, place dependence is a functional attachment to a place usually due to location or specific landscape features. Place dependence is usually determined by evaluating a place against other alternatives (Yuksel, Yuksel, & Bilim, 2010; Williams, Patterson, Roggenbuck & Watson, 1992). Both of these dimensions have been shown to have high reliability when using four to six questions to measure each one (Williams and Vaske, 2003).

More recently, some researchers have suggested that other dimensions, such as place belongingness (Brownlee, Hallo, Moore, Powell, & Wright, 2014), rootedness (Tuan, 1980;

Hammitt, Backlund, & Bixler, 2006), familiarity (Hammitt, Kyle, & Oh, 2009), and affect (Halpenny, 2010; Ramkisson, Weiler, & Smith, 2012) may also be important and separate dimensions to measure place attachment. There is some debate over which dimensions should be added to the traditional measures of identity and dependence to increase reliability and validity of measuring place attachment. Further, Hammitt et al. (2009) found that models with more dimensions had a higher validity than the two-dimension model; one of their additional dimensions was belongingness. For this study, we chose to include place belongingness, identity and dependence to measure place attachment. Place belongingness describes when people feel that they fit in and are a member of a particular place (Milligan, 1998). Brownlee et al. (2014) suggest using belongingness because previous research indicated stakeholders at their study location may have strong feelings of belonging to the location. As suggested by prior research (Brownlee et al., 2014), belongingness is an important construct to consider when visitors have a strong connection and familiarity with the place. We hypothesize that many visitors to MDI have strong feelings of belonging to the location as they are repeat visitors, or may have a family connectedness to the place.

Place attachment also has many implications for land and visitor management, as research has shown, place attachment influences people's attitudes and behaviors (Kyle, Absher, & Graefe, 2003; Halpenny, 2006, Budruk, Thomas, & Tyrrell, 2009). Further, multiple studies have demonstrated that destinations with vast natural resources, such as national parks, tend to generate place attachment (Warzecha & Lime, 2001; Moore & Graefe, 1994; Mitchell, Force, Carroll, & McLaughlin, 1993). This has proven to have many benefits for the location, such as increasing pro-environmental behavior (Halpenny, 2010), compliance with park regulations and fees (Kyle et al., 2003; Williams & Watson, 1998), and increased revisit intention (Kil, Holland,

Stein & Ko, 2012). Attachment to a place is a positive predictor for concern over various environmental factors, which then influences behavior (Brownlee et al., 2014; Halpenny, 2010). Those that have higher attachment to an area have been shown to have remarkably high levels of concern about how land is managed, which can help managers anticipate public reactions to decisions (Williams, Patterson, Roggenbuck, & Watson, 1992). Research has revealed that visitors place attachment to a destination influences their environmental concern and awareness of issues (Lee, 2011), ultimately impacting behavior (Cheng, Wu, & Huang, 2013; Halpenny, 2010; Lee, 2011). Although heavy tourism could put stress on a landscape and thus decrease visitor satisfaction (Pietilä & Fagerholm, 2016), increasing place affect could mitigate some effects by helping mediate pro-environmental behavior (Ramkissoon, Smith, & Weiler, 2013).

There are still gaps in the literature on what factors predict and foster place attachment, and the role that recreational activities play in how visitors enjoy and connect to a place. A study in Maine, U.S., found that visitors became more attached to a place when they gained more knowledge of a place and the recreational experiences (Ednie, Daigle, & Leahy, 2010). In New York, U.S., researchers found that participation in cultural activities was a significant predictor of place attachment, but nature-based and water activities were not significant predictors (Schuster, Sullivan, Kuehn, & Morais, 2011). Another study found that the reasons people are attached to certain places do not vary depending on recreational activities participated in at those places (Eisenhauer, Krannich, & Blahna, 2000). In an urban park in Georgia, U.S., place attachment differed depending on the primary recreational activity of visitors, with those walking or hiking having the highest place attachment (Sharp, Sharp, & Miller, 2015). These studies show that there is currently mixed conclusions on the influence of recreational activities on place attachment, and that more research needs to be conducted to provide more robust inferences.

Some studies have begun to investigate how place attachment impacts future visitation. Repeat visitors are important because it is more cost-effective to keep visitors returning rather than attract new visitors (Petrick, 2004; Shoemaker & Lewis, 1999). Additionally, if visitors are loyal to a place, they are more likely to attract more people to an area through word-of-mouth (Petrick, 2004). Previous studies have found place attachment to be a positive indicator of future visitation to an area (Hou, Lin, & Morais, 2005; Ednie et al., 2010; Kil et al., 2012). Additionally, Neuvonen, Pouta, and Sievänen (2014) found that place attachment increased revisit intentions to national parks in Finland, which would then boost the economies of nearby communities. Therefore, fostering place attachment could be critical for the sustainability of some tourism destinations. However, there is no research on how place attachment would affect future visitation under changing climate conditions. Since place attachment varies depending on the location, this research focuses on visitors' attachment to Mount Desert Island, a popular tourist destination in Maine, USA, and home to Acadia National Park.

Study Purpose and Hypotheses

This study aims to investigate the relationships between visitor place attachment, recreational activities participated in, and intended future visitation under differing weather and environmental conditions resulting from climate change. The authors have the following hypotheses: (1) those who have a greater attachment to MDI will participate in more activities during their trip, (2) those who have a greater attachment to MDI will participate in more nature-based activities during their trip, and (3) those that have high attachment to MDI will be less likely to be deterred from future visitation under changing climate conditions.

This research will help tourism destination managers, planners and service providers better understand the role place attachment plays in tourists' decision to return to a location under differing conditions. We expect study results to inform businesses' long-term plans to either cope with or capitalize on predicted visitation changes in light of climate change; other locations could also use these insights to help assess their own long-term sustainability under climate change. It is also expected to help inform Acadia National Park's management about how visitation to the park could be altered by groups with varying attachment to the destination. Additionally, this study aims to expand the literature on how recreational activities people participate in impact their attachment to a place. If place attachment proves to be a predictor of future visitation intentions, managers and tourism organizations could focus on product development and packaging experiences to foster visitors' place attachment, and hence increase repeat future visitation.

Methodology

Study Site

This study looks at visitors to Mount Desert Island (MDI), which is the largest island off the Eastern coast of Maine. Maine is located in the northeastern part of the United States and is one of the most forested states in the U.S. (90% of land area) (McCaskill et al 2011), with a low state population density of 1.3 million (US Census Bureau, 2010). Maine has a large tourism industry, attracting 18.0 million tourism-related overnight visits and 21.6 million day visits in 2015 (Maine Office of Tourism, 2016). The tourism industry in Maine is primarily nature-based, and the diverse land and seascapes allow for participation in a variety of outdoor-recreation and

tourism activities. MDI contains many recreational opportunities both within Acadia National Park and the towns on the island.

Acadia National Park is the main attraction on the island, which receives 2 to 3 million annual visits; in 2016, during Acadia's centennial celebration, the park received 3.3 million visits (National Park Service, 2017). Acadia National Park has both mountains and coastline, which provides bountiful recreational opportunities such as hiking, biking, boating, swimming, climbing, and camping. Given that MDI only has a year-round population of 10,000, and that 94% of visits occur between May-October, the island swells with tourists in the summer and early fall (National Park Service, 2017). MDI was chosen as the study site because it is the most visited nature-based tourist destination in the state. The towns on Mount Desert Island rely heavily on tourism, as many visitors to Acadia shop, dine, and lodge at towns on the island.

Climate has already been changing in Maine and on MDI. In Maine, average annual temperature has increased by 1.7 °C from 1895 to 2014, and average annual precipitation has increased by 15 cm (13%). Most of the precipitation increase has occurred during the fall and summer, with more frequent and intense storms (Fernandez et al., 2015). By 2050 in Maine, models project an additional 1.1-1.7 °C increase in average annual temperature and a 1-7% increase in precipitation, with more precipitation variability predicted, and more of the precipitation falling as rain and less as snow (Fernandez et al., 2015). On MDI specifically, warming has been more prominent in the winter, spring has been starting three weeks sooner, fall frosts starting later, rain events have been more intense, and the prevalence of Lyme disease is increasing (Star et al., 2015).

A recent study showed that a majority of summer visitors to MDI thought climate change would have negative consequences on tourism. In particular, visitors expressed concern over

environmental changes including sea level rise, the increase in extreme temperatures, the greater frequency of rain and storms, and the effects on endemic wildlife (De Urioste-Stone, Scaccia, & Howe-Poteet, 2015). A recent study, using temperature alone, predicted that Acadia National Park is expected to have an increase in visitation by the 2050s, with larger increases expected in the spring and early summer (Fishichelli, Schuurman, Monahan, & Ziesler, 2015). These studies of visitor perceptions and modeling show that people are likely to change their tourism behavior under differing changing climate conditions.

Survey design and sampling procedure

Sampling

Visitors were chosen using a two-stage cluster probability sampling design, using simple probability random sampling to select the days/locations to administer surveys, and systematic random sampling of visitors once on-site (Scheaffer, Mendenhall, Ott & Gerow, 2012). We used twenty survey locations throughout the state, including visitor centers, state parks, an international airport, and Acadia National Park.

For this study, we focused in visitors who indicated they visited MDI during their current trip. Across Maine, we surveyed 850 people who were visiting MDI during their trip. Of those, 416 responded to the follow-up survey (response rate of 48.9%).

Survey implementation

Data was collected using a short on-site form to collect sociodemographic and travel behavior data, followed by a self-administered online questionnaire. The research team had on-site interactions with visitors between May-November 2015 throughout the state of Maine.

During the on-site interaction, visitors were given a postcard with a link to access self-administered online questionnaire, and a personal access code to reduce sampling error (Sue & Ritter, 2012). Visitors were also asked for contact information to send reminders about the survey, as suggested by a tailored survey design method (Dillman et al., 2014). Up to three reminders were sent through email, and those without internet access had the option of completing the survey on paper and mailing it back.

Survey Instrument

The survey instrument consisted of four sections and was a self-administered online questionnaire (Dillman, Smyth, & Christian, 2014). Visitors were asked about their trip characteristics, spending and travel behavior, future visitation intent under varying conditions, activities participated in, attachment to MDI, and demographics. Questions measuring visitation intent under potential future conditions were developed from open-ended responses from visitors to MDI (De Urioste-Stone et al., 2015) and previous research on visitors' perceptions of the likelihoods of various conditions (De Urioste-Stone, Le, Scaccia, & Wilkins, 2016). Place attachment questions were chosen based off previous questions used by Brownlee et al. (2014) and Hammitt et al. (2009). Table 1 shows the fourteen questions asked pertaining to place attachment and what dimension of the construct they were measuring.

[Table 1 near here]

Data Analysis

Using SPSS 23.0, visitors were sorted into clusters using a multivariate two-step cluster analysis based off visitors' identity, dependence, and belongingness to MDI (silhouette= 0.6).

Only visitors who answered all questions on place attachment were included in this analysis (n=343). Identity and belongingness were measured using the mean of four items each, and dependence was measured by the mean of six items. All of the questions per dimension were averaged to obtain one value measuring each of identity, dependence, and belongingness. Internal consistency was checked using Cronbach's reliability coefficient, and showed that the questions had high internal consistency for identity (α=0.896), dependence (α=0.941), and belongingness (α=0.911).

This analysis yielded three segments of MDI visitors: those who had low, medium, and high attachment to MDI. Chi-square tests and Analysis of Variance (ANOVA) were used to test for significant demographic differences between the clusters. To test for differences between the groups in activity participation and future likelihood to visit, Levene's statistic was used to first test the assumption of equal variances. ANOVAs with Tukey's Post Hoc were used if variances were equal, and a Welch statistic with Games-Howell Post Hoc was utilized for those with unequal variances (Vaske, 2008).

Non-response bias was assessed using Pearson's chi-square test of independence to compare those who responded to the survey either with no reminders or one reminder (n=321), and those who responded after two or three reminders (n=95). Previous research has found that those who respond after the last mailings tend to be similar to non-respondents (Armstrong & Overton, 1977). These comparisons yielded no significant differences between the groups for age (x^2= 7.77, 7 df, p=.35), gender (x^2=.04, 2 df, p=.98), education (x^2=3.31, 7 df, p=.86), household income (x^2=10.27, 7 df, p=.17), and length of stay (x^2=6.31, 5 df, p=.28).

Results

Segmentation

Visitors who spent time on MDI during their trip were segmented into three groups based on their identity, dependence, and belongingness towards MDI. Table 2 shows the clusters, their size, and characteristics. The largest segment included visitors with medium attachment to place (n=168), and those with high attachment (n=92) slightly outnumbered those with low attachment (n=83). Those in the medium attachment group were neutral towards the place attachment questions, tending to answer around 3, "neither agree nor disagree." Those in the low attachment group tended to disagree with the attachment questions, while those in the high attachment group tended to agree. Across all clusters, visitors were most likely to express identity, and least likely to express dependence.

[Table 2 near here]

Visitor Profile and Recreational Activities by Cluster

Visitors to MDI tended to be predominately female (57.5%), older (mean of 53.2 years), well educated (77.3% having bachelor's degrees or higher), and stay overnight (96.4%). There were no significant differences between clusters in terms of gender, mean age, travel group size, level of education, and region (Table 3). There were differences in annual household income and length of stay between the groups. More people with high attachment tend to be in the low income bracket and have longer stays.

[Table 3 near here]

For each respondent, the total number of recreational activities participated in was added, as well as the total number of nature-based activities, and whether or not their primary activity was nature-based. Differences among the attachment segments were compared.

Those who had a high attachment to MDI participated in more recreational activities overall and also had greater participation in nature-based activities (Figure 1). The high attachment group participated in a mean of 7.18 recreational activities on their trip to the destination, the medium group participated in 6.04, and the low attachment group participated in 5.73 (p=0.00). As for nature-based activities, the high attachment group participated in a mean of 4.64 activities, 3.84 for the medium attachment group, and 3.57 for the low attachment group (p=.001). Further, visitors' primary recreational activities were sorted into three categories: not nature-based, somewhat nature-based, and entirely nature-based. A chi-square revealed significant differences between the attachment groups; proportionally, more visitors with high attachment listed nature-based recreation as primary activities than the other groups (x^2=15.58, 4 df, p=.004, τb=.009).

[Figure 1 near here]

Additionally, Table 4 shows what percentage of visitors in each attachment cluster participated in differing recreational activities. As shown in Figure 1, those with high attachment to MDI tended to participate in more activities overall; therefore, this group also had the highest participation in every activity except "sightseeing/driving for pleasure." There were significant differences between percentages of each group that participated in many nature-based activities, including: backpacking/hiking, biking, canoeing/kayaking, and picnicking.

[Table 4 near here]

Future Visitation

Many visitors, especially those with low place attachment, indicated they would change their future visitation if certain conditions were altered. Those with low attachment to MDI are the most likely to not return to the destination under potential changing climate conditions. Those with high place attachment are overall less likely to change intended future recreational behavior with climate change (Table 5). Of the possible conditions listed, the potential for hurricanes, flooding, and increased ice storms had the most negative impact on future visitation intent. Heat waves were the only condition listed that evoked a positive response, with the high attachment cluster indicating this would make them slightly more likely to visit.

[Table 5 near here]

Discussion

One initial finding was that visitors tended to show a higher agreement with the measures of identity than dependence, with belongingness falling in the middle. This finding is consistent with previous studies (Brownlee et al., 2014; Ednie et al., 2010) and makes sense in the context of the location. There are many other nearby islands and coastal destinations available in the region, so visitors might not be quite as dependent on MDI itself. Further, we found that asking four to six questions to measure each dimension of place attachment provided high reliability and consistency, as suggested by Williams and Vaske (2003).

Results show that those with high attachment to MDI participated in a greater variety of activities during their travels; however, there were no significant differences between the groups with low and medium attachment. Although there is a correlation between recreation activities and place attachment, it is inconclusive whether participating in more activities fosters place

attachment, or if those who are already attached tend to participate in more activities because they already know the place and opportunities better. A previous study in Sweden found that people who feel at home in a particular area are more likely to participate in outdoor activities there, speculating that they would have a deeper understanding of what activities are best in the area (Adevi and Grahn, 2011). Additionally, since the high attachment cluster tended to have longer visits, the length of stay could allow visitors more time to participate in a wider variety of activities. Still, results are interesting in that the significant differences in activity participation between the clusters manifested in the nature-based activities (backpacking/hiking, biking, canoeing/kayaking, and picnicking), but not any of the non-nature-based activities (e.g. arts/culture, nightlife, shopping). This suggests that the type of activities participated in may be more important in predicting place attachment than the sheer number and variety of activities. This is important for tourism management around MDI and suggests that developing, packaging, and promoting nature-based tourism experiences/opportunities could help foster place attachment to the destination.

This fits with previous research, with one study finding that the number of activities was not a significant predictor of place attachment (Jorgensen & Stedman, 2006), yet a different study found place attachment was affected by certain types of activities, but not all (Schuster et al., 2011). Schuster et al. (2011) found that cultural activities were a significant predictor of place attachment to residents near the Hudson River Valley, New York, but nature-based and water activities were not. This is contrary to our findings, but could be attributed to the fact that resident place attachment may manifest under different conditions than visitor place attachment. Additionally, influential activity predictors of place attachment are likely to vary depending on

the geographic location, setting, and type of recreationist (Kyle, Bricker, Graefe, & Wickham, 2010).

Another aim of this study was to explore whether place attachment would help repeat visitation numbers and long-term sustainability of a destination under changing climate conditions. Previous studies (Hou et al., 2005; Ednie et al., 2010; Kil et al., 2012) found place attachment to be a positive indicator for future visitation to an area. However, this study addressed the lack of research on how differing conditions from a changing climate would impact visitation differently based on place attachment levels. It was found that those with a high attachment to MDI were less likely to change their future visitation intent under potential negative changing climate conditions. However, this correlation was not as strong as the authors hypothesized, since there were only significant differences for five out of nine potential future conditions. This research also found that hurricanes were the largest weather deterrent of future visitation to MDI, which fits with previous research on risk perceptions and future visitation intent on MDI (De Urioste-Stone et al., 2016).

Furthermore, there were no significant differences in future visitation intent between the low and medium attachment groups. This could indicate that visitors need to have a strong sense of place attachment to retain future visitation, and thus increasing attachment levels from completely absent to neutral may not be helpful. However, developing place attachment to a natural area has many benefits beyond increased revisit intent and local economic stimulus (Wolf, Stricker, & Hagenloh, 2014). Place attachment to natural areas has also been shown to increase feelings of community, stewardship of natural resources, and pro-environmental behavior (Kim and Kaplan, 2004; Cheng, Wu, & Huang, 2013; Buta, Holland, & Kaplanidou,

2014), which can help mitigate some of the negative effects heavy visitation and crowding has on popular protected area tourism destinations.

Results may reflect the measures used, and future studies could be more specific on weather conditions to ensure everyone has the same definition of statements such as "increased rain," for improved clarity and reliability. Additional research could use discrete choice experiments to present specific scenarios under climate change and see how choices differ based on level of attachment. Additionally, future research could explore more in-depth why certain activities may be more likely to foster place attachment, and how these influential activities differ based on the tourism resources and attractions at the destination. Since climate change is going to have varying impacts on tourism resources depending on the location, more research is needed in other settings to better understand the impact of place attachment on revisit intention under climate change scenarios.

Conclusion

This study investigated the interaction between place attachment, recreational activities, and future visitation intent to better understand the long-term sustainability of a nature-based tourism destination under a changing climate. Results are important because tourism is a critical component of many economies and climate change is altering tourism visitation globally. Revenue from visitors to Acadia National Park supports the communities on MDI. Therefore, it is important to understand how visitation might be altered under climate change, either positively or negatively, so businesses and land managers can plan ahead for potential changes. To keep visitors returning under potential changing climate conditions, it would be beneficial to increase visitor attachment to the destination. Additionally, knowing how the recreational activities

participated in affects place attachment is useful to understand how to develop feelings of place attachment. To foster place attachment and thus make visitors less likely to adjust visitation behavior under changing climate conditions, it would be useful to develop, package, and promote more nature-based activities at the visitor's centers or as part of a tourism advertising campaign to foster greater visitor place attachment.

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Table 1. Questions asked pertaining to place attachment, on a 5-point scale.

Identity
I feel very attached to MDI
MDI means a great deal to me
I identify strongly with MDI
MDI reflects the type of person I am
Dependence
Visiting MDI is more important to me than visiting any other area
I get more satisfaction out of visiting MDI than any other place
No other place can compare to MDI
I would not substitute MDI for any other place
MDI is the best place for what I like to do
MDI is my favorite place to be
Belongingness
I feel like I belong in MDI
I feel connected to MDI
I feel like I am myself in MDI
I feel happiest when I am in MDI

Table 2. The three different clusters of visitors to MDI, size of clusters, and the inputs' means by group, on a scale from 1 (strongly disagree) to 5 (strongly agree). N = 343.

Cluster	**1**	**2**	**3**
Label	Low Attachment to MDI	Medium Attachment to MDI	High Attachment to MDI
Size	24.2% (83)	49.0% (168)	26.8% (92)
Inputs	Identity: 2.11	Identity: 3.10	Identity: 4.16
	Dependence: 1.82	Dependence: 2.76	Dependence: 3.71
	Belonging: 1.88	Belonging: 3.03	Belonging: 3.97

Table 3. A profile of visitors who responded to the self-administered survey, broken down by cluster. Numbers for the segments and sample average are expressed as percentages for gender, education, income, length of stay, and region. Age is in mean years, and travel group size is expressed as mean number of persons per party.

Demographic and trip characteristics	Sample Average (n=369)	Attachment to MDI Clusters			ANOVA F/Chi Square	Sig.
		Low (n=83)	Medium (n=168)	High (n=92)		
Gender					1.56	.816
Male	41.5	37.8	41.3	44.0		
Female	57.5	62.2	58.7	56.0		
Age in years					2.19	.114
Mean	53.2	54.3	54.0	50.9		
Travel group size					1.28	.279
Mean	2.9	2.6	3.1	2.9		
Education					10.23	.249
High school or less	5.7	7.3	3.6	9.8		
Some college	8.2	9.8	9.5	4.3		
2-year degree	8.7	11.0	8.3	6.5		
Bachelor's degree	30.9	23.2	35.1	31.5		
Graduate degree	46.4	48.8	43.5	47.8		
Combined annual household income					23.43	.001
$0 - $50,000	11.5	1.4	9.8	25.3		
$50,001 - $100,000	37.1	43.5	38.5	29.9		
$100,001 - $150,000	27.1	29.0	28.7	19.5		
$150,001 or greater	24.3	26.1	23.1	25.3		
Length of Stay					17.97	.021
Day trip	3.6	0.0	4.2	3.3		
1-3 Nights	26.9	32.5	31.1	15.4		
4-7 Nights	55.0	59.0	50.3	58.2		
8-14 Nights	12.3	8.4	12.6	19.8		
15+ Nights	2.2	0.0	1.8	3.3		
Region From					18.43	.103
Maine	7.7	2.4	6.6	14.2		
Northeast	41.6	42.7	38.9	46.2		
South	24.8	20.7	27.5	24.2		
Midwest	12.4	17.1	12.0	7.7		
West	8.3	8.5	10.2	4.4		
International	5.2	8.5	4.8	3.3		

Table 4. Percentage of visitors to MDI who participated in various activities (throughout Maine) by segment.

	Attachment to MDI					
	Low (n=83)	**Medium (n=168)**	**High (n=92)**	**Chi Square**	**Sig**	**Cramer's V**
Arts/Culture	34.9	37.5	45.7	2.44	0.30	0.08
Backpacking/hiking	71.1	70.8	89.1	12.18	0.00	0.19
Biking	24.1	25.6	41.3	8.57	0.01	0.16
Bird watching	22.9	32.1	39.1	5.33	0.07	0.13
Boating	30.1	33.9	38.0	1.22	0.54	0.06
Camping	13.3	14.9	21.7	2.80	0.25	0.09
Canoeing/kayaking	18.1	25.6	35.9	7.24	0.03	0.15
Climbing	18.1	16.7	20.7	0.64	0.73	0.04
Concert/festival	20.5	15.5	27.2	5.15	0.08	0.12
Nightlife	20.5	19.6	22.8	0.37	0.83	0.03
Picnicking	41.0	43.5	57.6	6.21	0.05	0.14
Shopping	71.1	76.2	81.5	2.64	0.27	0.09
Sightseeing/driving for pleasure	95.2	92.9	94.6	0.63	0.73	0.04
Viewing wildlife	80.7	82.7	85.9	0.85	0.65	0.05

Table 5. How varying conditions would influence the decision of visitors to MDI to travel to the area on future trips, by level of attachment to MDI. Scale: 1 (extremely likely to visit) to 5 (extremely unlikely to visit), with 3 being "no effect."

	Attachment to MDI					
	Low (n=83)	**Medium (n=168)**	**High (n=92)**	**Levene's stat (sig)**	**ANOVA F/ Welch (sig)**	η_p^2
Extreme weather events	4.13[a]	3.90	3.74[a]	0.46 (.63)	3.18(.04)	0.02
Hurricanes	4.37	4.35[a]	4.03[a]	0.26 (.77)	7.18 (.03)	0.02
Reduced snow	3.07	3.13	3.03	6.66 (.00)	0.61 (.79)	0.00
Flooding	4.05	4.14	3.88	0.43 (.65)	3.91 (.17)	0.01
Increased presence of ticks	3.47	3.45	3.18	1.38 (.25)	5.05 (.10)	0.01
Increased presence of mosquitos	3.48[a]	3.41[b]	3.12[a,b]	3.00 (.05)	6.95 (.02)	0.02
Increased ice storms	4.16[a]	4.01	3.74[a]	0.16 (.86)	8.09 (.03)	0.02
Increased rain	3.42	3.36	3.26	2.59 (.08)	1.16 (.59)	0.00
Heat waves	3.20[a]	3.02	2.87[a]	0.50 (.61)	4.91 (.05)	0.02

[ab] Means followed by the same letter are statistically significant at $\alpha = 0.05$ found using Tukey's Post Hoc test for equal variances, and Games-Howell when variances were unequal.