



Why do normative encounter standards change? The social evolution of recreational crowding

Walter F. Kuentzel^a, Thomas A. Heberlein^{b,c}, and Daniel W. McCollum^d

^aRubenstein School of Environment and Natural Resources, University of Vermont; ^bDepartment of Community and Environmental Sociology, University of Wisconsin – Madison; ^cDepartment of Wildlife, Fish, and Environmental Studies, Swedish University of Agricultural Sciences; ^dUSDA Forest Service, Rocky Mountain Research Station

ABSTRACT

Why do recreational carrying capacity standards change over time? When shared evaluative standards change at a recreational destination, what are the social processes that might lead people to evaluate “how many is too many” differently over time? This study examined how 24-year changes in personal, social, and experiential characteristics of boaters at the Apostle Islands National Lakeshore were related to changes in their evaluation of encounters with other boaters. The results showed that boaters had become more tolerant of encounters over time. This normative change was associated with a changing profile of visitors with an increased percentage of older empty-nest boat owners, who were more skilled and experienced, and more committed to the Apostle Islands boating experience. These visitors were part of a developing boater community and were less worried about “crowds” and more interested in the social presence of other boaters as part of their recreational experience.

KEYWORDS

Apostle Islands National Lakeshore; crowding; hierarchical linear modeling; normative standards; visitor change

Carrying capacity planning has primarily relied on cross sectional measures of visitors’ normative standards about encounters in a specific recreational setting (Manning, 2007). Over time, however, visitors can change, along with the way they engage in recreational activities at a destination. Do changing visitors and changing visitor behaviors mean that normative standards about encounters at a destination also change? Past research about stability vs. change of normative standards over time is mixed. Shelby et al. (1988) and Cole et al. (1995) were inconclusive about stability or change in evaluative standards. Bacon et al. (2001) presented evidence for norm stability. While, Kuentzel and Heberlein (2003) presented evidence for norm change. Research has shown that activity setting may explain some of this norm change variation. The strength of encounter norms is greater among backcountry visitors than those visiting front country or urban/built sites (Donnelly et al., 2000; Kuentzel et al., 2008). These studies, however, have not explored stability vs. change in visitor populations and activity behaviors over time. This study used longitudinal data from boaters at the Apostle Islands National Lakeshore (3-waves measured across 24 years) to examine changing visitors and the way those changes influence encounter evaluations.

Many social processes can alter the type of boaters visiting the Lakeshore and potentially lead them to evaluate encounters with others differently over time. For example, tax laws in the 1980s provided boat owners with a tax write-off and consequently swelled the number of boats in the local charter fleet. People could own a boat, rent it to offset operating costs, and then write off annual depreciation on their tax return. Consequently, nearly three-fourths (72.9%) of the overnight Apostle Islands visitors in 1985 rented a boat for their trip. This rental option attracted more first-time boaters and less committed boaters who did not want the responsibility of boat ownership (Kuentzel & Heberlein, 2003). When the tax laws changed in the late 1980s, the rental fleet declined. In 1997, 55.7% rented a boat for their trip. With this decline in boat charters, boat ownership likely has increased among visitors along with the potential for greater boating experience, boating commitment, and perhaps a greater affinity for boating around the Apostle Islands.

Another example is demographic changes such as an aging baby-boom population (Kuentzel & Heberlein, 2003). Aging boaters can potentially mean more empty-nest couples and fewer family groups on board. The average age of Apostle Islands boaters was 35.9 years in 1985 and 44.4 years in 1997. In addition, 23.5% of the Apostle Islands boating groups had children on board in 1985, and 20.6% had children on board in 1997. Consequently, these older boaters had more boating experience, and felt a greater sense of attraction to the area. They also tended to take more trips to the Islands and stay longer in the area. When changes like this persist, it may be indicative of a maturing “boating culture” (Levy, 1989) that may shift one’s tolerance of others at the destination.

The goal of this article was to understand why encounter norms changed, as they did at the Apostle Islands (Kuentzel & Heberlein, 2003); and to help managers think about, and respond to changing visitor composition, behaviors, and perceptions. Instead of simply establishing a carrying capacity limit, knowledge about the dynamics of social change can provide better options for managing biophysical impacts while accommodating the potential for changing visitor populations and preferences, different styles of recreational participation, and emergent types of recreational experiences at a destination.

Encounter evaluations

Earlier research demonstrated that feeling crowded at a recreational setting was less about visitor density and more about variation in the way people evaluate encounters with others (Shelby & Heberlein, 1986). Studies in the 1970s asked participants to provide a number of encounters they would tolerate before feeling crowded (e.g. Heberlein & Vaske, 1977). Subsequent studies asked about visitors’ expected encounters and preferred encounters and then compared those with actual encounters (Schreyer & Roggenbuck, 1978; Shelby et al., 1983). These earlier indicators, however, struggled with a variety of measurement issues, and it took the recreational carrying capacity field at least a decade to settle on a more precise way to measure encounter standards (Vaske et al., 1986). The normative standards approach used today employs Jackson’s (1966) “return potential” method, where respondents evaluate the acceptability of specific encounter levels that range across possible encounters at a location. The normative

standard is the point where the number of encounters falls into the unacceptable range. Past longitudinal studies exploring recreational crowding used the earlier measures. This longitudinal study was able to use the more precise normative standard measure.

Social and behavioral change

The profile of visitors may change over time, bringing new people into the activity who are prone to evaluating the social conditions of their recreational experience differently. The nature of the recreational experience may change because of managerial, environmental, cultural, or other unforeseen modifications at a location, making visitors evaluate the number of “acceptable” encounters differently. In this article, we examined five potential changes that could affect the way visitors think about their recreational experiences and their encounters: 1) Apostle Islands experience and commitment, 2) boating lifestyle engagement, 3) social group composition, 4) trip experience, and 5) socioeconomic background.

The Apostle Islands experience

Growth in the Apostle Islands as a boating destination since the 1960s has dramatically changed the region’s boating experience. During the 1960s, the City of Bayfield’s tax records each year listed 30–50 “pleasure craft” that were anchored in two marinas. The establishment of the National Lakeshore in 1970 brought two new marinas to the area, and the charter fleet of sailing vessels peaked in 1984 at 178 boats (Marina marketing information, Sailboats Inc., Superior Charters, Madeline Island Yacht Club, Annual). Four additional marinas were added by 2000, even though the charter fleet had declined to less than 90 boats. The growth in private boat ownership and decline in demand for chartered boats likely means that boaters today have more experience, greater commitment, and enhanced knowledge about the Islands than boaters in the past. Research in the 1980s on “experience use history” (EUH) used an information processing framework to argue that past experience afforded more cognitive resources from which one could formulate more elaborate knowledge, behavioral preferences, and management opinions related to recreation participation (Hammitt & McDonald, 1983; Schreyer et al., 1984). Those with more experience may therefore evaluate encounters differently based on more elaborate knowledge about the area and commitment to the Apostle Islands experience.

In an earlier study, Kuentzel and Heberlein (1992) found that boaters with more Apostle Islands experience actively avoided crowds by seeking out remote less-used overnight anchorages around the Islands. Some research confirms this greater sensitivity to encounters among more experienced users (Eder & Arnberger, 2012; Graefe & Moore, 1992), while other studies have shown no relationship (Absher & Lee, 1981; Budruk et al., 2002; Kuentzel & McDonald, 1992). These mixed findings could be related to differences in site characteristics and the attachment visitors feel for the place (Warzecha & Lime, 2001; Wickham & Kerstetter, 2000). They may also be related to differences in activity characteristics. At the Apostle Islands, boat ownership and maintenance, along with marina fees and trip expenses can be a consuming investment. Few people would make this type of committed investment without first having developed

an ongoing attraction to the Apostle Islands boating experience and interest in the management and well-being of the National Lakeshore. Therefore, we expect that:

- 1a) Apostle Islands experience and commitment among boaters will have increased over time.
- 1b) It is unclear, however, whether increasing experience and commitment results in boaters who are negative, neutral, or even positive about encounters with others.

Boating lifestyle

If recent visitors have become more actively involved in the Apostle Islands boating community (Levy, 1989), it is also likely that they are more likely to have developed a leisure lifestyle centered around boating (Kelly, 1983; Stebbins, 2007). The specialization framework is one way to describe this sort of lifestyle development. The specialization framework expanded the cognitive focus of the EUH framework to include indicators such as skill development, deepening lifestyle involvement such as boat ownership, and socialization into leisure based communities. Using these measures, the framework maintains that people over time tend to progress from novice to expert in a recreation activity (Bryan, 1979; Scott & Shafer, 2001). A panel study of earlier 1975 and 1985 Apostle Islands boaters found that the majority did not follow a path of specialization progression, but instead remained casual boaters or dropped out of boating altogether (Kuentzel & Heberlein, 2006). Nevertheless, with the increasing number of boat owners and the commitment required of boat ownership, the Apostle Islands may now attract a more dedicated and experienced group of boat owners rather than the earlier less specialized boat charterers. Specialization studies have mostly shown that more specialized visitors tend to evaluate encounters more negatively (Graefe et al., 1986; Leujak & Ormond, 2007), although at least one study (Kuentzel & McDonald, 1992) found no relationship. We therefore expect that:

- 2a) Overall boater skill, experience, and involvement will have increased in the 1990s and 2000s, and,
- 2b) Those with more boating skill, experience, and involvement will evaluate encounters more negatively than those with less skill, experience, and involvement.

Social composition of boater groups

Change in encounter evaluations may also be related to changes in the social groups of boaters at the Apostle Islands. Because visitors have been getting older, they are less likely to have children on board, and are more likely to visit as couples rather than in large groups of friends (Kuentzel & Heberlein, 2003). These changing group dynamics can reflect different trip purposes and consequently different ways that visitors interact with others in their boating community. The leisure social worlds framework (Devall, 1973; Ditton et al., 1992; Scott & Godbey, 1992) focuses on these dynamics of social networking among leisure participants. This approach analyzes how people come together around shared leisure interests and behaviors, and how they develop a sense of shared social identity that revolves around the culture of an activity (Levy, 1989). It is

possible that the Apostle Islands boating culture has shifted away from larger groups of extended family or friendship groups on multiple chartered boats to smaller groups or couples on mobile second homes. The way people evaluate encounters may therefore be related to the differing social purposes that brought them together. Past research has focused mostly on group size and has shown that encounters with larger groups increases perceived crowding (Graefe et al., 1984; Tarrant et al., 1997). We therefore expect:

- 3a) Group size will decrease over time and there will be fewer groups with children, and more 2-person couples.
- 3b) Boaters in smaller groups, groups without children, and couples groups, will evaluate encounters more negatively than those in larger groups, groups with children, and groups with friends.

Trip experience

Changes in the recreational experience (Mannell, 1999) may also cause participants to change the way they evaluate encounters. Changes in experience characteristics may be related to the addition (or subtraction) of recreational facilities and services. At the Apostle Islands, these could include lighthouse restoration projects, new interpretive programs, dredging for dock access, dock and facility maintenance, accessibility for the disabled, resource damage from overuse, or wilderness designation (in 2005). Boating experience change may also be related to boat design improvements, the growth of new activities such as sea kayaking, or charter fleet changes. These factors can work individually or interactively to change expectations and perceived performance of the setting and managerial components of boater experiences (Burns et al., 2003), which could then change encounter evaluations. This analysis examines changes in the Apostle Islands boater experience such as the greatest concentration of boats seen anchored, the desire to find more remote places to anchor, perceived environmental damage, and overall trip satisfaction. In a well-managed environment, one would expect these indicators to improve in a positive way. We would therefore expect that:

- 4a) Trip experience evaluations and overall satisfaction will show improvement over time.
- 4b) Boaters more likely to avoid crowded places, perceive more environmental damage, and see more boats anchored will evaluate encounters more negatively. Those who are more satisfied with their trip will also evaluate encounters more negatively.

Socioeconomic background

Perhaps one of the most obvious reasons that evaluative standards at the Apostle Islands may have changed is because of socioeconomic change among visitors. National trends show changes in age structure, educational attainment, income, marriage rates, and residential choices (Amato, 2014; Biblarz & Raftery, 1999; Gavrilov & Heuveline, 2003). At the Apostle Islands, the declining number of boaters with children due to an aging boater population would be consistent with literature about declining youth participation in outdoor recreation activities (Dickinson, 2013; Louv, 2008). Other

literature suggests that aging baby-boomers are still driving participation in many outdoor recreation activities (Freedman, 2008; Ziegler, 2002). An older population of boaters may find an increase in encounters reassuring. Although an empty nest couple on a romantic getaway may find an increase in encounters annoying. Increases in educational attainment and income could indicate an increase in older boaters employed in professional careers with greater disposable income. These more affluent boaters may be boat owners with more exacting expectations about their boating experience, which could affect the way they evaluate encounters. Thus we expect that:

5a) The socioeconomic profile of visitors to the Apostle Islands will have changed in a way that mirrors national trends, and

5b) Older boaters will evaluate encounters more positively, while married boaters and boaters with more educational attainment and income will evaluate encounters more negatively.

Methods

Study site

The Apostle Islands National Lakeshore is an archipelago of 21 islands in Lake Superior on the northern tip of Wisconsin in the United States. The area was added to the U.S. National Park system in 1970, and almost 90% of the Lakeshore was included in the National Wilderness Preservation System as the Gaylord Nelson Wilderness in 2005. The Lakeshore includes one strip of the mainland providing access to the Squaw Bay sea caves for kayakers in summer and hikers across the ice during winter. Otherwise, access requires a boat: sail boats and powerboats with sleeping accommodations (usually ~28 feet or more), kayaks, or the concessionaire shuttle with scheduled service to five islands. The sail boaters and power boaters sampled in this study can tie up to Park Service docks or anchor in one of the protected bays, and then visit interpretive programs at the six lighthouses, the Manitou Island fishing camp, and the Stockton Island visitor center. They may also sunbathe on the beaches, hike trails on the islands, use the picnic facilities, fish for lake trout or whitefish in the channels between the islands, or relax on their boat in a calm and scenic bay.

Sampling

Since 1975, we have sampled at various times all groups of Apostle Islands visitors—sail boaters, power boaters, kayakers, and tour boat passengers. Data for this study came from three cross-sectional waves of a longitudinal study of overnight boaters to the Apostle Islands in 1985, 1997, and 2009. The sampling design for each of these three waves was essentially the same. In 1985, boaters were selected from one of five overnight anchoring locations that provide the most protection from wind and changing weather: Presque Isle Bay and Quarry Bay at Stockton Island, and anchorages at Rocky, Raspberry, and Oak Islands. In 1997, Sand Island had become a popular anchoring location and was added to the sampling design. In each of the three sampling years, these

locations accounted for approximately 90% of the total overnight visitation according to Park Service use statistics.

For each of these three waves, boaters were selected using a stratified random sampling design. Sampling days were selected proportionate to use for shoulder season (June and September–October) and high season use (July–August). Days were also selected proportionate to weekend day use and week day use. Proportions were drawn from the previous year's Park Service use statistics (1984, 1996, and 2008). Sampling locations were scheduled proportionate to overnight use. For example, Presque Isle Bay at Stockton Island received a little over 50% of the total overnight use, so sampling took place at this location for at least half of the sample days.

Research staff were placed at sampling sites for periods of two to four nights at randomly selected times throughout the sampling season (June through October). Each evening, they approached all boats anchored in the bay or tied to the dock and asked each person on board to fill out a census card asking for their name, mailing address, and email address (in 2009). This procedure yielded 1,217 names in 1985, 1,802 names in 1997, and 1,008 names in 2009. From these sampling frames, we selected a stratified random sample of boaters that was proportionate to the sample year visitation (from NPS use statistics) based on island visited and peak season/shoulder season. We selected 500 names in 1985, 560 names in 1997, and 709 names in 2009. In 1985, there were 377 people who returned surveys for a 75% response rate. In 1997, there were 389 people who returned surveys for a 69% response rate. Finally, in 2009, there were 459 responses for a 65% response rate.

The 1985 and 1997 waves used mailed surveys and Dillman's 3-contact protocol (Dillman et al., 2008). In 2009, we asked respondents to provide email addresses, and then gave them the opportunity to respond to the questionnaire online. More than half the people in the 2009 sample frame provided email addresses (593). After drawing our sub-sample, we sent email invitations to 513 people. Nearly half (251 people or 48.9%) of the 513 responded online. Paper surveys were then sent to the 196 people who did not provide an email address and to the 262 people with email addresses who did not respond to the online invitation. Overall, half (54.7%) of the 459 respondents filled out the questionnaire online. Past research has questioned whether mixed method approaches can introduce potential sampling bias into the data (Gigliotti & Dietsch, 2014; Graefe et al., 2011). Oneway analysis of variance used on the 2009 data showed no difference between online respondents and mail respondents in age, education, income, residence (urban vs. rural), or marital status. Online respondents were more committed to boating at the Apostle Islands than mail respondents in 2009, but there is no reason to believe the more committed boaters would be less likely to respond to mailed surveys in earlier waves of the study.

Before beginning the analysis, we weighted responses from each wave to account for potential selection bias. Those who spent more days sailing around the islands potentially had a greater opportunity of being selected than those who made shorter trips. We therefore weighted responses in inverse proportion to the number of days the individual spent at the Islands. For example, a boater staying ten days in the islands received a weight one-fifth the size of a boater who only spent two days in the islands.

Measurement

Dependent variable

All variables included in this study used identical wording and measurement scales across the three waves. The dependent variable for the study was encounter evaluations using Jackson's return potential curve method (1966). Respondents were asked to evaluate encounters at Presque Isle Bay at Stockton Island, which is by far the most popular anchoring site in the archipelago. "If you were going to anchor in Presque Isle Bay, how would you feel about seeing [_____] boats anchored off shore?" Researchers filled in the blanks by hand with one of nine encounter levels: 1, 3, 5, 7, 9, 11, 15, 25, and 35. Respondents were then asked to rate their given encounter level on a 5-point scale from "very unpleasant," "unpleasant," "neutral," "pleasant," or "very pleasant." Respondents were also given an option to check "I'm not sure; I've never been to Presque Isle Bay." In 1985, 40.4% checked this latter option, while 12.7% checked this in 1997, and 18.1% checked this in 2009. These respondents were excluded from the final analysis, because they had no direct experience at the location.

Independent variables

The analysis used seven indicators to measure Apostle Islands experience and commitment. First was the number of years a respondent had been boating at the Apostle Islands. Second was the total number of past visits to the Islands. This variable was measured with a 9-point log linear scale from "my first visit" to "more than 30 visits." The next indicators were the total number of trips made to the Apostle Islands during the sampling year, and the total number of days spent boating at the Apostle Islands during the sampling year. We also asked about the duration in days of their longest trip during that boating season. Next, we measured commitment to the Apostle Islands with a four point scale: "Being in the Apostle Islands" (1) "doesn't really matter," (2) "is pleasant, but I could enjoy boating in most places," (3) "is important, but there are a few other places I like to boat," and (4) "is the most important part of a trip." Finally, activity attraction was a scale measure ($\alpha = 0.64$) constructed from five items that asked people what attracted them to the Apostle Islands (using a 4-point scale from "definitely no" to "definitely yes"). These items included "The big water feel of Lake Superior," "The lore of the islands," "The uniqueness of the islands," "The weather in the area," and "The sense of freedom the islands give."

Boating lifestyle was measured with six indicators. Boating skill was a self-reported assessment from "none," "novice," "intermediate," "high," and "expert." The overall boating experience indicator asked respondents to report the number of years they had been "boating in a boat large enough to have sleeping accommodations?" The questionnaire also asked about their extent of boating in other locations. This item was an additive scale enumerating twelve other U.S. sailing destinations, such as the Florida Keys, coast of Maine, Chesapeake Bay, the Baja Peninsula, and the St. Lawrence Seaway. Finally, the questionnaire measured boating socialization by asking, "When you were growing up, did you boat or sail with your parents." Respondents were given a 4-point scale from "never," "seldom," "occasionally," and "frequently." Lastly, we asked

respondents (yes/no) if they chartered the boat they used at the islands, and in a separate question asked them if they owned the boat they used at the islands.

We measured the social composition of boater groups with four indicators. Respondents were asked to think about their single best trip to the islands during the sampling year, and enumerate (1) the total number of people on board, (2) the number of family members on board, and (3) the number of children (16 or under) on board. For the analysis, we created from the total group size indicator a dichotomous yes/no variable of people who traveled as couples. In addition, children on board was also collapsed into a dichotomous yes/no variable.

Trip experience was measured with four indicators. The first measure asked respondents, "On your best trip, what was the greatest number of boats you saw docked and anchored at the island at which you were moored for the longest period of time?" People could respond to a 10-item log linear scale from "0 boats" to "more than 20 boats." We also asked respondents (Yes/No) if they avoided "anchoring or docking overnight at certain islands because you felt they were too crowded?" The next measure was a 5-item scale ($\alpha = 0.89$) that asked about respondent perceptions of environmental damage at the Islands, which included "excessive litter," "trampling of vegetation," "overuse of campsites," "overuse of trails," and "poor water quality." Finally, we asked respondents to rate their single best trip to the Apostle Islands during the sampling year, using a 5-point scale from "fair," "good," "very good," "excellent," and "perfect."

Finally, the socioeconomic profile of visitors to the Apostle Islands in this analysis was measured with five indicators. These variables including age, total years of education, income (standardized to 2005 dollars), marital status, and residence in an urban or suburban area.

Analysis

To predict variation over time in encounter evaluations using the return potential approach, we used a hierarchical linear modeling (HLM) method of analysis. Statistical controls were necessary for two categorical variables in the model: time (3 categories) and encounter evaluation (9 categories). An ordinary least squares (OLS) regression approach would require two dummy variables to account for time (1985, 1997, and 2009), and eight dummy variables to account for evaluation category (1 encounter, 3 encounters, 5 encounters, etc.). Ten additional dummy variables in a model would be cumbersome and difficult to interpret. HLM uses a restricted maximum likelihood estimation technique that allows the inclusion of both interval data measured at the individual level (Level 1) and categorical data (Level 2) in the model (Raudenbush & Bryk, 2002). In this study, Level 1 data include individual responses about boater experience and commitment, skill, experience, trip perceptions, satisfaction, and demographics. Level 2 data include time categories: 1985 ($n = 377$), 1997 ($n = 389$), and 2009 ($n = 459$); and the encounter level respondents had been assigned to evaluate: 1 boat ($n = 117$), 3 boats ($n = 136$), 5 boats ($n = 117$), 7 boats ($n = 141$), 9 boats ($n = 109$), 11 boats ($n = 99$), 15 boats ($n = 118$), 25 boats ($n = 112$), and 35 boats ($n = 103$). HLM allowed us to test for the effects of individual variables (Level 1) on encounter evaluations while controlling for time and controlling for different encounter level prompts (Level 2). Our analysis first regressed encounter evaluations on time

controlling for encounter level prompt to test for significant change in encounter standards over time. Then, we regressed encounter evaluations on the independent Level 1 variables, controlling for both encounter level prompt and time, to test how visitor change affected encounter standards.

Results

Changing Apostle Islands boaters

Table 1 shows boater responses to each independent variable have changed significantly over time (except for income). Among the Apostle Islands experience variables, boaters in 2009 had more years of experience boating in the area, had made more previous visits, were more committed to boating at the Apostle Islands, and were more attracted to the setting than were visitors in either 1985 or 1997. The 1997 boater means were also greater than the 1985 boater means for each of these four comparisons. Boaters in 2009 and 1997 had equivalent numbers of trips to the Apostle Islands, spent an equivalent number of days, and reported an equivalent length-of-stay on their longest trips. Each of the means for these three indicators was significantly greater than the means for 1985 boaters.

Table 1. Mean indicators of change among Apostle Islands boaters, 1985–2009.

	1985	1997	2009	F
The Apostle Island experience				
Years ai experience	4.8 _a	9.0 _b	11.2 _c	52.2
Past visits to AI	3.6 _a	7.8 _b	9.2 _c	38.6
Number of trips	1.5 _a	1.8 _{ab}	2.0 _b	4.9
Number of days	4.9 _a	6.4 _b	7.3 _b	9.9
Duration of longest trip	3.7 _a	4.2 _b	4.2 _b	4.9
AI commitment	2.4 _a	2.8 _b	2.9 _c	34.2
Activity attraction	15.7 _a	16.4 _b	17.1 _c	39.8
Boating lifestyle				
Boating skill	1.8 _a	1.8 _a	2.3 _b	31.8
Boat elsewhere – AI	0.9 _a	1.2 _b	1.5 _c	14.2
Years boated	5.5 _a	9.5 _b	13.7 _c	87.6
Boated with parents growing up	1.0 _a	1.1 _b	1.4 _c	14.2
% Own boat used at AI	21.2 _a	30.6 _b	34.2 _b	9.0
% Chartered boat	72.2 _a	55.5 _b	47.5 _c	27.6
Boater groups				
People on board	5.1 _a	4.8 _{ab}	4.5 _b	6.9
% With children on trip	23.5 _a	20.6 _{ab}	17.3 _b	2.4
% Couples	5.8 _a	12.4 _b	13.0 _b	6.7
Family on board	1.4 _a	1.6 _a	1.9 _b	8.0
Trip experience				
% Avoided crowds	10.9 _{ab}	13.3 _a	6.8 _b	5.0
See environmental damage	12.5 _a	11.2 _b	10.3 _c	32.1
Most boats seen	8.5 _a	9.6 _b	7.8 _a	10.5
Trip satisfaction	3.7 _a	3.8 _a	4.1 _b	29.9
Socioeconomic profile				
Age	35.9 _a	44.3 _b	52.2 _c	178.3
Education (years)	13.7 _a	14.0 _b	14.3 _c	22.5
Income × 1000 (2005 constant \$)	84.4	84.6	89.5	2.1
% Married	62.1 _a	60.9 _a	74.6 _b	11.3
% Urban/Suburb residence	81.1 _a	76.3 _a	67.0 _b	11.6

Note: Subscripts indicate statistically significant differences between years.

The results in [Table 1](#) also show that boating lifestyle indicators have increased over time. Boaters in 2009 reported significantly greater skill, were more likely to boat in diverse places, had significantly greater years of boating experience, and were more likely to have boated with their parents when they were children. The 1997 boaters had significantly greater years of experience, greater diversity of boating destinations, and were more likely to have boated with their parents than 1985 boaters.

Significant changes in social composition of boater groups are evident in [Table 1](#), though the direction of change was not uniform across all indicators. Boaters in 2009 were more likely to visit with fewer people on board, and less likely to charter a boat than visitors in 1985 and 1997. Boaters in 2009 were more likely to travel as couples, have more family members on board, own their boat, and less likely to travel with children than 1985 boaters. The means for these four indicators did not differ significantly between 2009 and 1997 boaters.

[Table 1](#) shows that 1997 boaters were generally more likely to feel the need to avoid crowded islands, and more likely to see larger numbers of boaters anchored at night. This is consistent with Park Service visitor use statistics, which show that 1997 received the greatest number of overnight boater visits among the three sample years. Boaters in 2009 were less likely to recognize environmental damage around the islands than 1985 and 1997 boaters, and were significantly more satisfied with their visits than boaters in the other two waves.

Finally, the results in [Table 1](#) show changes among boaters' socioeconomic profile. The mean age of boaters over the 24-year period increased from 36 years old in 1985, to 44 in 1997, to 52 in 2009. The results also show a small but significant increase in educational attainment over time. Finally, 2009 boaters were more likely than 1985 and 1997 boaters to be married, and less likely to live in urban or suburban neighborhoods.

Changing normative standards

The norm curve results for the encounter evaluations ([Figure 1](#)) were visually difficult to determine if they had changed significantly across time. The 1985 line passes below the neutral line sooner than the 1997 and 2009 lines, so one could argue that more boaters over time have become more tolerant of encounters. Each encounter category, however, did not change consistently across the years. Those evaluating 1-boat encounter, 11-boat encounters, and 25-boat encounters changed little over time. Those evaluating 5-boat encounters, 7-boat encounters, and 9-boat encounters became more positive in their evaluative standards. Those evaluating 3-boat encounters, 15-boat encounters, and 35-boat encounters bounced around in unpredictable ways. This pattern of variation makes it difficult to determine if the differences are significant. These results demonstrate the need for the model to control for variation in the way different encounter level evaluations changed across time.

Controlling for variation in boat encounter evaluations, the results from the hierarchical linear model showed that evaluative standards have indeed changed significantly over time ([Table 2](#)). The intercept for the equation with time entered as a dependent variable was 2.83 (on a 1–5 scale), with a coefficient of 0.186 (SE = 0.038, $p = .00$). This means that the model would predict a group mean for 1985 boaters of 2.83 on the

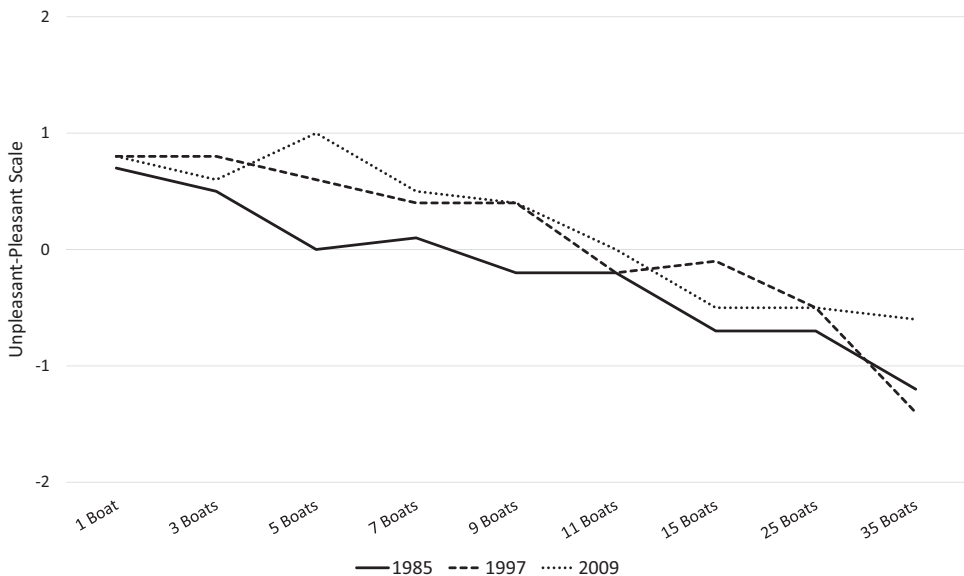


Figure 1. Apostile Islands norm curves for each sample year.

Table 2. HLM model of the effect of time on encounter evaluations, controlling for evaluation category.

	<i>B</i>	SE	<i>p</i>
Intercept	2.830	0.210	.00
Time	0.186	0.038	.00
	–2Log Likelihood	Residual	ICC
Unconstrained Model	2241.1	785 (0.030)	31.0
Full Model	2222.6	765 (0.037)*	32.7

*2.6% variance explained in the full model.

encounter evaluation variable, a group mean of 3.02 for 1997 boaters, and a group mean of 3.20 for the 2009 boaters, indicating that boaters have become more tolerant over time of encounters with others.

Table 3 shows the results of the multivariate model controlling for time and encounter evaluation category. Summary statistics for the unconstrained model shows goodness of fit and residual statistics for Level 2 variables only (encounter evaluation category and time). The full model shows goodness of fit and residual statistics for Level 1 independent variables and Level 2 control variables. These statistics show that the inclusion of independent variables explained 21.2% of the variance in the model.

Table 3 shows that 12 of the 26 variables entered in the model had statistically significant relationships with encounter evaluations when controlling for time and evaluation category. Two of the seven Apostile Islands experience indicators were related to encounter evaluations. First, those who had made more previous visits to the Apostile Islands were more likely to evaluate encounters more positively. With a model intercept of 2.73, this means that the predicted encounter evaluation score for those making their first trip to the Apostile Islands would be 2.73, while the predicted encounter evaluation

Table 3. HLM model controlling for evaluation category and time.

	<i>B</i>	<i>SE</i>	<i>p</i>
Intercept	2.73	0.350	.00
Past visits to Apostle Islands	0.009	0.003	.00
Activity attraction	−0.047	0.014	.00
Boating skill	0.097	0.034	.00
Boated with parents growing up	0.078	0.024	.00
Own boat used at AI	0.166	0.069	.02
People on board	0.049	0.013	.00
Avoided crowds	−0.362	0.093	.00
See environmental damage	−0.025	0.007	.00
Most boats seen	0.044	0.004	.00
Trip satisfaction	0.136	0.035	.00
Age	−0.006	0.002	.01
Urban/Suburban residence	0.121	0.066	.06
	−2Log Likelihood	Residual	ICC
Unconstrained model	2241.8	747 (0.037)	34.2
Full model	2088.9	565 (0.030)*	40.7

*21.2% variance explained in the full model.

score for those who had made 25 previous trips to the islands would be 2.96 (0.009 times 25). Second, those who are more drawn to boating in the Apostle Islands because of the experiences its natural and scenic amenities provide evaluate encounters with other boaters more negatively. Two of the boating lifestyle indicators were significant in the multivariate model. Both perceived skill and childhood boating socialization had a positive relationship with encounter evaluations. As boaters develop more skill, they were more likely to evaluate encounters with other boaters more positively. In addition, those who boated with parents as children more frequently were more likely to evaluate encounters with other boaters more positively. Two of the social group variables were significant in the multivariate model. Those who boated with more people on board evaluated encounters more positively. Additionally, those who owned the boat they used on their Apostle Islands trip evaluated encounters more positively. All four of the trip experience variables had a significant effect in the model. Those who avoided anchoring at crowded islands evaluated encounters more negatively. In addition, those who perceived more environmental damage around the islands evaluated encounters more negatively. Conversely, those who saw more boats evaluated their encounters more positively. Finally, those who were more satisfied with their trips also evaluated encounters more positively. Finally, two socioeconomic variables had significant effects in the multivariate model. [Table 3](#) shows that older people evaluated encounters more negatively and that people who lived in urban or suburban residences evaluated encounters more positively.

Discussion

Changing norms

The results from this study confirmed Kuentzel and Heberlein (2003) conclusion that evaluative standards for encounters have changed, and that visitors to the Apostle Islands have become more tolerant of encounters with other boaters over time ([Table 2](#)). This finding adds to an emerging literature that documents the positive side of increasing recreational encounters. This body of research has documented the role of

place attachment (Wickham & Kerstetter, 2000), cultural tolerance among people of differing nationalities (Whiting & Nakos, 2008), and urban settings (Popp, 2012; Whiting & Nakos, 2008; Wickham & Kerstetter, 2000) as situational contexts in which recreationists welcome the presence of others. At the Apostle Islands, nearly 90% of the Lakeshore's land mass makes up the Gaylord Nelson Wilderness. The results show, however, that solitude was not the driving factor behind visitors' encounter evaluations. Rather, there were other situational changes that accounted for more tolerant encounter evaluations over time.

Social change at the Apostle Islands

One of the original objectives of this longitudinal study was to track the changes that were occurring at a "new" National Park. The Lakeshore was established in 1970 and our first wave of sampling began in 1975. We expected that National Park management of the Islands would attract new boaters to the area and that we would observe a process of maturation over time in boating behaviors and the "culture" of the Apostle Islands experience. Consequently, we hypothesized (Hypothesis 1a) increases in years of experience at the Apostle Islands, number of past trips, number of annual visits, and trip duration along with greater commitment to visiting the destination and a stronger attraction to the boating experience. The results strongly supported this expectation. Apostle Islands boaters today have more experience among the islands, spend more time there each season, are more committed to boating in the islands, and feel more drawn to the unique scenic, historic, and recreational amenities of the islands. The development of this Lake Superior destination has produced a growing number of repeat visitors committed to the uniqueness of the Apostle Islands experience.

Changing visitors at the Apostle Islands were also reflected in increased levels of boating specialization. An earlier panel study (Kuentzel & Heberlein, 2006) showed that the Apostle Islands were not a place where boaters progressed through stages of greater specialization (Bryan, 1979; Scott & Shafer, 2001). Instead, results from a 1975 panel (surveyed in 1975, 1985, and 1997) and a 1985 panel (surveyed in 1985 and 1997), showed that the majority of visitors maintained existing or declining levels of specialization, and only a small minority showed progressive levels of specialization over time (Kuentzel & Heberlein, 2006). The results from the current longitudinal study of three cross-sections, however, showed that more recent visitors to the Apostle Islands were more skilled at boating, had more years of boating experience, had boated at a greater number of destinations, were more likely to be socialized into boating participation by parents, and were more likely to be boat owners. More recent boaters are bringing with them increased boating skills, experience, and commitment than previous boaters. The results suggest that the evolving "culture" of boating around the Apostle Islands tends to draw a more developed sort of career participant (Stebbins, 2007) into the area.

With the maturing of the Apostle Islands boater, we expected that the group composition of boaters would also change over time (Hypothesis 3a). One of the most popular entries into this type of sailing as a leisure activity is through sailing schools offered by chartering companies. Those who were never socialized into the activity as children would often take a one to three day course on handling boats of this size. In 1985,

nearly three-fourths of the sample chartered a boat on their trip to the islands. This ratio had declined to less than half by 2009. The results showed that charter visitors traveled in significantly larger groups. The group size for charterers was 5.4 people across all three sample years, while the mean group size of people who did not charter a boat was 3.9 people ($F = 136.2$, $df = 1$, $p = .00$). As the proportion of people using the charter fleet declined, so did group size. Progressively fewer people traveled with children and an increasing proportion traveled as couples. The shrinking charter fleet meant that the Apostle Islands were attracting a more confident group of boaters, who perhaps felt they no longer needed a more experienced friend along, and who tended to travel as couples or smaller family groups that tended to exclude children.

The results showed that trip experience indicators have changed, but there was only modest evidence for improvement over time (Hypothesis 4a). Perceptions of environmental damage around the islands have declined steadily over time. This downward linear trend may be the result the National Seashore's long-term staff, whose experience may have equipped them to recognize and correct problems of litter, campsite and trail overuse, water quality issues, and vegetation damage. In addition, trip satisfaction had improved significantly in 2009 over the previous two waves. The two crowding related items, however, mirrored use levels and were less a reflection of improvement. National Park Service visitor statistics reported more than 15,800 overnight boater visits to the Apostle Islands in 1985. Visits then peaked in 1997 with over 17,400 visits and declined to just over 11,800 in 2009. The lower number of annual visits in 2009 meant that people saw fewer boats and felt less compelled to avoid overcrowded anchorage sites. Visitors in 2009 also perceived a more pristine environment than visitors in previous years and were more satisfied with their trip.

Finally, we hypothesized (Hypothesis 5a) that socioeconomic indicators of boaters at the Apostle Islands would follow national trends. To some degree, they did. The sample was aging, better educated, and a declining proportion of them lived in urban areas. However, the sample showed steady income levels across the three waves and an increasing proportion who were married. Neither of these two indicators followed national trends. Perhaps more importantly, the results indicated that 2009 visitors tended to be aging baby boomers, further along in their educational attainment and career paths, and with a greater proportion of empty nest couples, retirees, and those who have more residential options than younger people who are earlier in their career trajectory. This may mean that this group is better able to follow the non-metropolitan turnaround trends of moving from urban/suburban areas to more rural residential settings (Fulton et al., 2010). Moreover, an aging population of boaters may also be related to increasing experience at the Apostle Islands, involvement in the area's boat culture, overall increases in boating specialization, and group composition on-board one's boat. In sum, the importance of an aging population of Apostle Islands boaters cannot be underestimated as a cause for change at the destination.

Why did the normative standards change?

Data from the longitudinal study showed a maturing process of development of the Apostle Islands as a boating destination. Over time, the area has attracted people with

greater commitment to boating in the Islands, a stronger attraction to the amenities and experiences, and a greater frequency of visitation. Are these more recent visitors to the Islands more sensitive to the presence of others, feeling that others are intruding on their experience? Or are these more committed and experienced visitors to the Islands more welcoming of others and happy to share the experience (Hypothesis 1b)? The results from the full model were mixed.

Those with more past visits to the Apostle Islands evaluated encounters more positively than those with less experience in the area. This would partly explain why 1985 visitors, who had made substantially fewer previous visits to the Apostle Islands evaluated encounters more negatively (Figure 1) than more recent visitors with greater experience. The mean number of prior visits to the Apostle Islands among 1985 boaters was 3.6, while this had increased to 9.2 among the 2009 boaters. This indicates that an increase in the number of past visits to the islands over time is related to increasingly favorable encounter evaluations over time. Conversely, those who are more strongly attracted to the activity (Lake Superior big water, maritime history of the Islands, the freedom of the Islands) evaluated encounters more negatively than those less attracted to the Apostle Islands experience.

These findings did not support the findings of Eder and Arnberger's (2012) study of urban green space users and Graefe and Moore's (1992) study of snorkelers, but supported Wickham and Kerstetter's (2000) findings among local festival goers. The latter study used place attachment as an intervening variable to explain positive encounter evaluations among more experienced festivalgoers. This current study, however, found that greater activity attraction was related to more negative encounter evaluations. While activity attraction is not the same as place attraction, it is a parallel measure of recreation experience. Taken together, these mixed set of findings suggest that experience and commitment may not work in a uniform way across all settings. Instead, encounter evaluations may be an interaction between experiential cognitive learning and the unique experiences of the activity in a given setting.

Results from the boating lifestyle indicators ran counter to past research and did not support Hypothesis 2b. Past specialization research has mostly shown that specialization indicators are associated with negative encounter evaluations. In this study, results from the full model showed that those with greater boating skill, those who had boated with their parents as children, and those who were boat owners evaluated encounters more positively. Over time, boater skill had increased from 1.8 to 2.3 on a 5-point scale, the frequency of boating with one's parents had increased from 1.0 to 1.4, and boat ownership had increased from 21% to 34%. These findings indicate that it was the greater proportion of less skilled, first time charterers from 1985 who evaluated encounters more negatively than more recent visitors (Figure 1).

These results appear to be more consistent with the leisure social worlds framework (Ditton et al., 1992). The boating experience at the Apostle Islands is about more than the on-the-water activity experience of an individual boater who develops knowledge, skill, and resourcefulness while being challenged by Lake Superior big water. There is also the boating community (Johns & Clarke, 2001; Levy, 1989) that develops at the commercial marinas that serve the region. Boats anchored in the marinas are frequently used as vacation property, where owners live on-board during their holidays, and

actively socialize with friends and neighbors on other boats, exchanging boating stories, recommending equipment, exchanging maintenance tips, and relaxing together. The social presence of others, whether anchored at one of the Islands or tied-up at the marina may be as important as the open-water boating experience for many who have committed themselves to the lifestyle of the area's boating "culture."

The social nature of Apostle Islands boating was partially confirmed by the effects of group composition among boaters (Hypothesis 3b). While boating with children, couples only groups, and family groups had no effect on encounter evaluations, those who traveled in larger groups evaluated encounters more positively. Group size among boaters, however, has decreased over time (Table 1), and older empty nest couples are more frequently found boating around the Islands. Nevertheless, the results indicate that these smaller groups tend to be people with greater experience, skill, and commitment to Apostle Islands boating who evaluate encounters more favorably. Consequently, the negative encounter evaluations of smaller boater groups appears to be offset by the more positive encounter evaluations of more experienced visitors. These findings suggest that both solitude and community play an integrated role in the Apostle Islands experience. Traveling with a spouse, and anchoring alone in Justice Bay off Sand Island during the day, and then anchoring with six other boats in the East Bay of Raspberry Island at night can generate a mixed set of positive and negative encounter evaluations that make it challenging for managers to establish carrying capacity standards.

All of the boating experience indicators had a significant effect on encounter evaluations. The effects were partly related to changes in boater density and partly related to social dynamics of the boating experience. As expected (Hypothesis 4b), those who avoided the more crowded islands and boaters who noticed more environmental damage evaluated encounters more negatively. Conversely, those who anchored overnight with more boats and those more satisfied with their trips evaluated encounters more positively. Three of these indicators are consistent with more positive encounter evaluations among 2009 boaters. There are fewer crowd sensitive and environmental impact sensitive boaters in 2009 to make negative encounter evaluations. In addition, 2009 visitors were more satisfied with their trip, and therefore evaluated encounters more positively. The only variable that did not support the hypothesis was the number of boats seen anchored. Those who saw more boats evaluated encounters more positively. This too supports the importance of boating community, and reinforces the idea that there is not an inherent negative response to a larger number of encounters when anchored overnight.

Lastly (Hypothesis 5b), we expected that older people and married couples would evaluate encounters more positively, while those with higher educational attainment and incomes would evaluate encounters more negatively. None of the socioeconomic profile coefficients support the hypothesis. The results showed that older people were more likely to evaluate encounters more negatively. Age was shown to work independently of boating and sailing experience. Older people were more likely to have developed more skill and experience, which had a positive effect on encounter evaluations over time. Nevertheless, older people still evaluated encounters more negatively net of the effects of skill and experience. Older people may more often be experienced empty nest couples looking for solitude, and perhaps clinging to older normative standards for boating at the Apostle Islands.

Conclusion

The normative standards have changed at the Apostle Islands over the past 25 years because the area is attracting a different type of visitor. Visitors are more skilled and experienced at boating than before and more invested in the Apostle Islands boating experience. They are more likely to spend time in the gateway community participating in the boat and marina culture, joining a “Friends of the Apostle Islands” type of group, and giving advice and input to Park Service officials about how to encourage access and use of the islands. They are less worried about other boaters as “crowds” who disturb their solitude and more interested in other boaters as part of the total experience. Even though much of the Lakeshore is part of the Gaylord Nelson Wilderness, recreational solitude is not the primary basis on which visitors evaluate encounters. Rather, encounter evaluations at the Apostle Islands are also the product of an inherently social leisure experience that has developed around an evolving and maturing boating community. This finding demonstrates that carrying capacity models need to look beyond cognitive perceptions of crowding and goal interference frameworks to also include the social dynamics of activity experiences and the leisure social worlds that develop around participation. At some places like the Apostle Islands, managing for enhanced social experiences may be just as effective as finding ways to limit increased visitor demand.

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