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Economic Impacts & Non-economic Benefits of Tourism

NEW YORK STATE'S 1999 AGRITOURISM BUSINESS STUDY

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Abstract: Agritourism businesses (i.e., farm-based businesses that are open to visitors for recreational purposes) are becoming an important component of New York's tourism industry today. In order to estimate the economic impacts of these businesses on New York State and identify cost-effective management and marketing strategies for business owners, New York Sea Grant and Cornell University conducted a study of New York State agritourism businesses and their customers. With the assistance of six agritourism business owners, 299 customer surveys were completed in 1999. In addition, a sample of 2000 business owners were surveyed by mail in 2000, with a return rate of 38.8% or 645 completed surveys from the qualified sample. An estimated 2,087 agritourism businesses existed in New York State in 1999, yielding a total estimated net profit of nearly \$25.8 million. A breakdown of the types of agritourism businesses existing in New York State was generated from the results. Business owner concerns were identified, as well as the management and marketing strategies found to be most effective for attracting and managing visitors. This presentation will focus on the results of this study as well as its management and marketing implications for agritourism businesses.

Introduction

Many farm businesses in New York State today are opening their doors to visitors. Farm stands, wineries, maple syrup and honey producers, greenhouses and plant nurseries, and Christmas tree farms are just a few of the many types of farm-based businesses that are open to, and attract, visitors for recreational purposes (Kuehn & Hilchey, 2001). In order to identify the viability of agritourism businesses in New York State, estimate the economic impact of agritourism on New York State, and identify cost-effective management and marketing strategies for agritourism businesses, NY Sea Grant and Cornell University's Farming Alternatives Program, in conjunction with the Cornell University Statewide Committee on Community and Economic Vitality Tourism Work Group, conducted a two-part study of agritourism business owners and their customers in New York State in 1999 and 2000. Funding for this research was provided by the United States Department of Agriculture through Cornell University's Research and Extension Integration Grants Program.

Methods

The 1999 New York State agritourism business study consisted of two components: a customer survey and a business owner survey. The customer survey was conducted in 1999 with the assistance of six agritourism business owners in New York State. Business owners were requested to ask their customers to complete a short survey. A total of 299 customer surveys were completed and analyzed (Kuehn & Hilchey, 2001).

In 2000, a survey of agritourism business owners was conducted using a modified total design method (Dilman, 1978). A mailing list of 2,416 agriculture-related businesses open to the public was generated with assistance from agriculture and tourism agencies and organizations across New York State. The size of this initial mailing list is likely conservative since businesses not included in agency mailing lists may have been excluded. A systematic random sample of 2,000 businesses was generated from this initial mailing list. Farm business owners in this sample were sent surveys by mail and asked to report on their business activities for the calendar year 1999. A reminder postcard and follow-up survey were mailed to non-respondents. After businesses with undeliverable addresses and businesses not classified as agritourism businesses by their owners were removed from this sample, a qualified sample of 1,661 businesses remained. From this qualified sample, 9.7% of the surveys were returned by owners who did not wish to participate in the study, 51.5% were not returned, and 38.8% (645 surveys) were completed and used in this study (Kuehn & Hilchey, 2001).

Results

Data from the customer and business owner surveys were analyzed for New York State as a whole, and according to type of agritourism business (i.e., farm stand, Christmas tree farm, etc.) and New York State Department of Economic Development tourism region (Figure 1). In addition, results were broken down into the following subject categories: business income and net profit, promotional strategies, customer markets, management and operations, business owner concerns, and future plans of business owners.

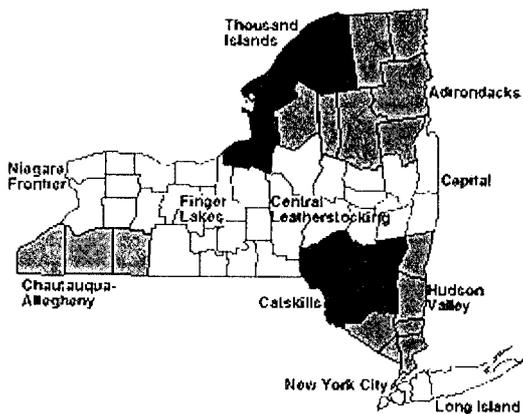


Figure 1. New York State Department of Economic Development Tourism Regions

Statewide Results

In New York State in 1999, farm stands made up the largest percentage of agritourism businesses (37.4%), followed by Christmas tree farms and u-pick operations. The largest percentages of agritourism businesses were located in the Finger Lakes region (27%) and Central Leatherstocking region (11.3%). Tables 1 and 2, respectively, list the percentages of respondents by agritourism business type and New York State tourism region in which businesses are located.

Table 1. The Percentages of Respondents by Agritourism Business Type in New York (n = 645)

Business types	Percent of respondents
Farm stands	37.4%
Christmas tree farms	11.9
U-pick operations	9.6
Maple producers	9.3
Greenhouses and nurseries	9.2
Other*	9.1
Wineries	6.2
Livestock breeders	4.5
Farm-based B&Bs	2.8
TOTAL	100.0%

*"Other" includes miscellaneous business types such as herb and perennial farms, petting zoos, community supported agriculture farms, farm-related museums, farm tour operators, and horse riding stables.

Table 2. The Percentages of Respondents by New York State Department of Economic Development Tourism Region (n = 645)

Tourism region	Percent of respondents
Finger Lakes	27.0%
Central Leatherstocking	11.3
Capital	9.9
Niagara Frontier	9.8
Hudson Valley	9.6
Adirondacks	7.9
Catskills	7.3
Chautauqua-Allegheny	6.5
Thousand Islands	5.6
Long Island	5.0
New York City	0.1
TOTAL	100.0%

Business Income and Net Profit

Statewide estimates reveal that an estimated 2,087 agritourism businesses within New York State received a total estimated gross income of \$210.87 million in 1999 from their agritourism business components (e.g., products and services such as educational programs, tours, hayrides, exhibits, crafts, and food tastings; n = 399). Due to high

costs associated with operating agritourism businesses, the total net profit of these businesses was estimated to be \$25.77 million, with the average agritourism business receiving an estimated net profit of \$12,347.

While the average agritourism business did make a profit in 1999, 25% of agritourism businesses either had expenses that equaled their income (i.e., they broke even) or had expenses that exceeded their income (i.e., they lost money). The most profitable types of agritourism businesses were greenhouses and plant nurseries, farm stands, and u-pick operations. The least profitable type was livestock breeding farms. Christmas tree farms, maple producers, farm-based bed and breakfasts, and wineries were all moderately profitable.

Promotional Strategies

Responding business owners used a diversity of promotional strategies to attract visitors to their businesses. Direct mailings, business signs, and brochures were the most cost-effective strategies used because, according to business owners, of their high effectiveness at attracting customers and their moderate cost. The use of newsletters was also found to be highly effective but had a higher cost associated with it. Television advertisements, newspaper advertisements, and radio advertisements were found to be moderately effective at attracting visitors but at a high cost.

Customer Markets

Knowing where customers of agritourism businesses are coming from and what their interests are is essential for implementing effective marketing strategies. According to responding business owners, most customers (57.6%) come from the same county in which the business is located; 30.6% come from other counties in New York State, 9.0% come from other states outside of New York, 1.7% come from Canada, and 1.1% come from other countries (n = 569). International visitors primarily came from England, Germany, Japan, and Ireland.

Customers are looking for businesses with friendly staff (71% of customers indicated that this is important to them), activities at the business (58%), businesses with farm animals (33%), and businesses with barns and historic buildings (32%; n = 267). Customers indicated that they would be most interested in sampling local foods and produce (47.2% of customers indicated this activity), sampling wines (44.2%), and picking fruits and vegetables (43.4%) at agritourism businesses in the future (n = 267). The top five activities that responding business owners indicated that their customers participate in are visiting parks, attending festivals, camping, visiting historic sites, and fishing.

Management and Operations

Responding business owners utilized many different management strategies for their businesses. Diversification of products and services was commonly used, with businesses offering farm tours and educational programs,

selling homemade foods and crafts, hayrides and sleigh rides, u-pick vegetables and fruits, and other business components as well. While only 4% of business owners indicated that they charge a general admission fee, many owners do charge a fee for specific activities on their farm such as educational programs and hayrides. The majority of agritourism businesses were open during specific seasons only in 1999, with 78% open during the fall, 76% during the summer, 60% in the spring, and 43% in the winter. Only 30% of all responding businesses were open year-round in 1999. Most agritourism businesses are family-operated, with an average of three family members as employees. In addition, the average business has six employees who are not family members.

Business Owner Concerns

The top five concerns of agritourism business owners were liability and liability insurance; marketing, promotion, and advertising; labor costs and issues; government regulations, and taxes. Eighty-four percent of respondents indicated that liability is a concern and 90% have purchased liability insurance to protect themselves from it (n=614). In addition, 71% of business owners regularly make any needed repairs to their business and 41% have added safety precautions (Kuehn & Hilchey, 2001). Conducting a risk analysis of their business, incorporating, having visitors signs a disclaimer, managing potentially dangerous visitor behaviors, and not charging admission (to reduce the status of the visitor from invitee to licensee) are used as well by some respondents.

Future Plans of Business Owners

When asked what their future plans for their business are, 64% of respondents indicated that they plan on expanding their business within the next five years (n = 581). In addition, 34% of respondents plan on investing more funding in their business, 21% on hiring more employees, and 8% in incorporating their business. These plans indicate that agritourism business in New York State will be expanding in general over the next five years. Seven percent of businesses plan on going out of business in the next five years, either due to the lack of business profitability or retirement of the business owners.

Conclusion

Agritourism appears to be an expanding component of New York State's tourism industry with many businesses

planning on expanding and hiring more employees during the next five years. In addition, 75% of businesses did make a profit in 1999 from the agritourism components of their farm business. This indicates that agritourism components are viable components of New York's farm-based businesses. However, while the average agritourism business in New York did make a profit in 1999, 25% of businesses did not, an indication that some agritourism businesses may need to utilize careful business planning procedures to increase their success.

The economic impact data compiled from this study indicate that agritourism contributes an estimated \$210.87 million in gross income to farm businesses across New York. Much of this revenue is in turn used by business owners to pay for farm operation and management costs such as employee wages and production costs, thus benefiting New York's economy as a whole.

This study was also useful for identifying cost-effective management and marketing strategies for agritourism business owners. Strategies such as reducing costs by buying insurance from agritourism associations at group rates and developing partnerships with other local businesses and attractions for promotional purposes could make businesses more profitable. Business owners also need to identify what makes their business unique and expand on this uniqueness to attract more customers.

In conclusion, agritourism offer tremendous potential to increase the profitability of farm-based businesses in New York State. Agritourism also benefits New York's tourism industry by diversifying the recreational opportunities offered to visitors and increasing the state's economy. However, because agritourism is a fairly new sector of tourism in New York, business owners may need management and marketing assistance from government agencies and organizations to achieve their potential in the future.

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RAIL-TRAILS AND SPECIAL EVENTS: COMMUNITY AND ECONOMIC BENEFITS

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Abstract: This paper discusses community and economic benefits associated with two recreational bicycle special events held on the Pere Marquette Rail-Trail (PMRT) in Midland County Michigan during the summer of 1999. One event was an annual ride to fundraise for the Rails to Trails Conservancy of Michigan. Approximately 1,800 participants rode in the event which included two days of riding on the Pere Marquette Rail-Trail. Overall the event produced \$207,000 of direct spending by travel parties in Michigan. The second event was the Midwest Tandem Bike Rally, an annual event staged in a different location each year over a weekend. In 1999, Midland was selected as the site and attracted 550 tandem bicycle teams. Overall the event produced \$260,000 of direct spending by travel parties in Michigan. The two events brought visitation to Midland that otherwise would not have occurred and for 25% of both events' participants, the Pere Marquette Rail-Trail was the primary draw to ride participation. The communities along the trail benefited from the exposure as over three-quarters of the participants were riding the trail for the first time. Further, the majority from both events indicated they were likely to return to the Pere Marquette Rail-Trail and county on a future trip. Discussion and implications of this research includes: (1) ways of maximizing economic impact through fee structure and overnight accommodation arrangements, (2) the importance of Rail-trail facilities to draw visitors to an area, and (3) how residential trail use displacement can be minimized during recreational bicycle events.

Introduction

Typically, research on trails developed from abandoned rail road right of ways, herein referred to as rail-trails, has focused on the use and benefits by local residents (Moore, Scott & Graefe, 1998; Mowen, Graefe & Williams, 1998). However, such facilities also attract visitors from beyond the local area, thereby contributing to local economies. For instance, Schutt (1998) showed that the use of the Bruce Trail in Ontario Canada was primarily by tourists (67%) and that many stayed overnight near the trail during the course of their trail use. Special trail-related events are also instrumental in attracting tourists. These events may be held using existing trail facilities and the tourism infrastructure (i.e., restaurants, hotels, bike-related retail, other retail).

The purpose of this paper is to report on and discuss community and economic impacts of two recreational bicycling events to a local economy in Michigan. These impacts will be reviewed according to community and economic variables and explained across both short-term and longer-term effects.

Description of Research Study, Rail-Trail and Two Special Events

A group of faculty from the Department of Park, Recreation and Tourism Resources at Michigan State University is conducting a two-year study of a single rail-trail in Michigan. The goal is to document some of the economic, social and community benefits such facilities provide. The Michigan Department of Transportation and Michigan Agricultural Experiment Station are the primary financial supporters of the research project. The project includes a group of advisory partners with representatives from the National Park Service's River and Trails Assistance Program, Michigan office of the Rail-to-Trails Conservancy, Michigan Department of Natural Resources, Michigan Department of Transportation, and the Midland and Isabella County Park and Recreation departments. These partners contribute in-kind and financial assistance and meet on a quarterly basis to suggest research direction and discuss applications of results. The focus of this research is the segment of the Pere Marquette Rail-Trail (PMRT) located in Midland County, Michigan. Midland County's population is approximately 80,000 people and is world headquarters to Dow Chemical Corporation. Initially developed in 1993, the 22 paved miles of the PMRT in Midland County connect three communities, including several public park and recreation facilities. A six-mile extension into the adjacent county is under construction, and due to open in the summer of 2001.

In general, the park and recreation departments of Midland County and the city of Midland allow limited use of the PMRT for special events. They view the trail as a public facility that should be open to all. Hence, events such as a bike race, that might otherwise displace normal use of the trail or endanger users, are generally not permitted. Two bicycling events that fit the special event use criteria were studied. The first is an annual event called the Michigander, organized by the Michigan Office of the Rails-to-Trails

Conservancy to promote recreational cycling and to raise money. The second is the Midwest Tandem Bike Rally, which is staged at a different Midwest location each year and promotes tandem cycling and raises funds. Both events used the PMRT during the summer of 1999.

Methods

A mail survey was used to collect data regarding the two special events. The Michigander was held in July 1999 and attracted 1,800 participants. Half of the participants rode the two-day event which primarily took place in Midland County, one-third rode six days and the remainder rode the full seven days, the longer time segments traversed the central part of Michigan. From the registration list (excluding individuals under the age of 18 years old), 600 participants were randomly selected. After a Dillman modified survey procedure including a reminder postcard and a second mailing, a 71 percent response rate (n=424) was achieved. The Midwest Tandem Rally was held over the Labor Day holiday in 1999 and attracted 1,100 participants or 550 tandem teams. Six hundred individuals from the registration list were randomly selected to receive the survey. Using the same mailing procedure as described above, a 75 percent response rate (n=452) was achieved.

The mail questionnaire consisted of four pages and included 27 questions. Questions focused on measuring experience levels with the event and the PMRT; whether the event was the primary reason for the trip; the nature of the travel party (i.e., friends) and spending party (i.e., family); spending before, during and after the event; intention to return to the Pere Marquette Rail-Trail and area; and demographics. Economic benefits are illustrated by calculating event spending, measuring the amount of tourism or out-of-county visitation the event yielded, and the potential for future visitation by the participants. Community benefits are illustrated by measuring the proportion of participants who

were introduced to the bicycling event or rail-trail through these two special events.

Results

A demographic profile of the respondents to the two day event is found in Table 1. While a minority (26%) of Tandem Rally participants were from Michigan, a strong majority (95%) of Michigander participants were (Table 1). In both groups, about half of the participants earned \$80,000 or more in 1998 annual household income and the majority were employed on a full-time basis. A minority of Michigander and Tandem participants had children in their household.

Michigander participants were less likely than Midwest Tandem Rally participants to be members of a bicycling organization (Table 2). Of those who were members of an organization, Michigander participants were most likely to be members of the Rail-to-Trails Conservancy while Tandem Rally participants were most likely to belong to a local bicycling organization, followed by the League of American Bicyclists and the Rail-to-Trails Conservancy. The financial commitment of participants in both events to cycling is significant, with Michigander participants averaging almost \$750 and Tandem participants averaging almost \$2,500 per year in cycling related expenditures during 1998. The largest proportion of expenses for both groups was equipment, followed by events/membership fees and repair costs.

When asked about the purpose of their trip that included event participation, almost all participants in both events cited the event as the main purpose for the trip (Table 3). This suggests that the visit to the Midland area would not have occurred if there was no event. Furthermore, 27% of Michigander participants and 23% of the Tandem participants indicated that the Pere Marquette Rail-Trail "highly or moderately influenced" their participation in the event.

Table 1. Demographic Profile of 1999 Michigander and Midwest Tandem Rally Participants

	Michigander (n=424)	Midwest Tandem Rally (n=452)
Residency		
Michigan resident	95%	26%
Nearby states/providences (IN, OH, IL, WI, Ontario)	3%	48%
Other states/providences	2%	26%
1998 Household income levels		
Under \$40,000	10%	9%
\$40,000 to \$80,000	44%	40%
Over \$80,000	46%	51%
Household composition		
With children	40%	26%
Without children	60%	74%
Employment status		
Full-time/self employed	76%	72%
Retired	9%	17%
Other	15%	11%

Table 2. Bicycling Profile of 1999 Michigander and Midwest Tandem Rally Participants

	Michigander (n=424)	Midwest Tandem Rally (n=452)
Membership in bicycling organizations:		
Local group	10%	66%
League of American Bicyclists	5%	30%
Rails-to-Trails Conservancy	29%	25%
League of Michigan Bicyclists	5%	12%
Average annual spending on bicycling		
Equipment purchases	\$478	\$1,860
Repairs	\$80	\$230
Events/membership fees	\$190	\$356
Average total spending on bicycling	\$748	\$2,446

Table 3. Purpose of Trip for 1999 Michigander and Midwest Tandem Rally Participants

	Michigander (n=424)	Midwest Tandem Rally (n=452)
Primarily purpose of trip related to event	99%	99%
Pere Marquette venue influence		
Not much	52%	61%
Some	21%	16%
Moderate	14%	14%
High	13%	9%

On a per person and overall basis, Tandem Rally participants spent more than Michigander participants (Table 4). Excluding the registration fee, Michigander participants and their travel parties spent \$207,000 in conjunction with the event or \$233 per travel party. This amounts to \$100 per person over the course of the event. Of the \$207,000 total spending, half was spent before or after the event and half during the event. Six-day participants were responsible for 50% of the overall spending. The \$81,700 in Michigander registration fees paid to the Michigan Office of the Rails-to-Trails Conservancy provided some funds for the organization's fund raising efforts and for services and supplies to support the ride. Michigander sponsors also arranged camping at locations such as schools, fairgrounds, etc., so many participants did not stay overnight in paid

accommodations. In total, Michigander participants booked an estimated 510 hotel room nights, including 150 room nights during the event.

As for the Midwest Tandem Rally participants, they paid fees for each aspect of their experience (i.e., fee per day of riding, banquet, box lunches, etc.). Since the researchers were not provided the registration fee data paid per participant by the sponsors, we asked this of respondents. Overnight accommodations were arranged separately. Over three-quarters (82%) of the Tandem Rally participants stayed overnight in a hotel, with a small segment camping or staying with friends or family. In total, 1,100 hotel room nights were estimated. Including the registration fee, participants and their travel parties spent \$260,000 in conjunction with the

Table 4. Spending Profile of 1999 Michigander and Midwest Tandem Rally Participants

	Michigander (n=424)	Midwest Tandem Rally (n=452)
Total spending	\$207,000	\$260,000
Proportion of spending		
Before and after trip	50%	15%
During trip	50%	85%
Average spending per party	\$233	\$566
Average party size	2.3	2.5
Total hotel room nights	510	1,100

event or \$566 per travel party (average 2.5 persons). Of this \$218,000 was spent during the event (mostly likely in the Midland area) and \$42,000 was spent in Michigan getting to and from the event. With multiplier effects, the total impact on the state economy is \$390,000 in sales, \$140,000 in personal income, \$222,000 in value added, supporting about eight jobs, mostly in Midland County. These figures assume all of the spending would not otherwise occur in Michigan, as 74% of the participants were out-of-state residents.

The economic impact of these events may extend into the future as 79 percent of the Michigander participants and 54 percent of the Midwest Tandem Rally participants said they are extremely or quite likely to ride the rail-trail again (Table 5). Ninety-four percent of the Michigander participants rated the Pere Marquette Rail-Trail "very good" or "good." The event experience was rated "very good" by 54 percent of the participants and "good" by 36 percent. An even greater proportion of Tandem Rally participants were positive about the rail-trail. Ninety percent rated it "very good" and eight percent rated it "good." The Tandem Rally event was also rated higher than the Michigander, with 71 percent rating it "very good" and 27 percent rating it "good."

Community benefits were measured by the proportion of participants who were introduced to these annual bicycling events or the PMRT through these two 1999 events. The assumption is being made that encouraging participation in outdoor recreation activities like bicycling enhances quality of life. Furthermore, the higher the first-time event participation and Pere Marquette Rail-Trail users show growth in the activity and trail use. Of the participants in the Michigander event, 42 percent were first-time event riders compared to 27 percent of the Tandem Rally participants. Eighty-three percent of the Michigander participants were riding the PMRT for the first time and 91 percent of the Tandem Rally participants were first-time PMRT users.

Conclusions and Implications

This research illustrates a rail-trail offering a compatible, sustainable tourism resource for events that produce positive economic impact to a local economy, while simultaneously serving the needs of local residents. Combined these two recreational bicycling events generated close to \$500,000 of direct spending in the areas where participants rode and stayed overnight. Moreover, our findings suggest many of the participants indicated they would return to visit the area and/or ride the rail-trail, bringing future economic benefits. The results also demonstrate events introduce new people to activities, facilities and communities. Higher levels of trail and community awareness can lead to increased future usage and economic impact.

The results of this study also demonstrate how different events can lead to different levels of economic impact. The Michigander was primarily marketed to and attended by Michigan residents. Therefore, the economic impact was more a redistribution of money rather than new money to the state. The Michigander also generated fewer overnight rooms and local bed taxes than the Tandem Rally as most participants camped in the group camps set up by Michigander organizers. Also, most of the meals were provided by the Michigander sponsor or donated by local groups, so spending on food and restaurants was limited. The Midwest Tandem Rally was shorter in length but more highly concentrated in the City of Midland and Midland County. More hotel room nights, bed taxes and restaurant purchases were generated, as the Rally did not have prearranged group camping and meal options. The Tandem Rally attracted many more out-of-state participants to Michigan, which represents "new" money. Another factor in calculating economic impact is to consider how the registration fee is being spent. While the Michigander had a higher registration cost it appears that a greater percentage of the budget was spent out of the Midland County area on bulk event supplies and assisting the Conservancy in their programs.

Table 5. Likelihood of Returning to Area and Satisfaction with Event and PMRT for 1999 Michigander and Midwest Tandem Rally Participants

	Michigander (n=424)		Midwest Tandem Rally (n=452)	
	<u>PMRT</u>	<u>Midland County</u>	<u>PMRT</u>	<u>Midland County</u>
Likelihood of return visit				
Quite likely	50%	54%	15%	12%
Extremely likely	29%	23%	39%	39%
Quite unlikely	17%	19%	36%	37%
Extremely unlikely	4%	4%	10%	12%
Satisfaction level				
	<u>Trail condition</u>	<u>Experience</u>	<u>Trail condition</u>	<u>Experience</u>
Very good	82%	54%	90%	71%
Good	12%	36%	8%	27%
OK	4%	8%	1%	2%
Poor	1%	2%	0.5%	0%
Very Poor	1%	0%	0.5%	0%

Local entities incurred some costs to host these events. Local bicycle groups and the local convention and visitors bureau had expenditures in planning and marketing the events. It is not known if this resulted in additional memberships for the bicycle organizations. The convention and visitors bureau fulfilled their mandate to increase hotel occupancy using bed tax money for event marketing. The City of Midland and Midland County Parks and Recreation Departments coordinated (and paid for) police and park maintenance to service both events. Again, the image of Midland as a quality destination to visit or place to live is an intangible value that may more than compensate for these expenditures.

A final note is that these events often require a park administration to draft and pass rules that suggest how events can use the facilities. These rules should be focused on maintaining the facility and allowing continued public use during the event. This can promote positive interaction among visitors and locals and safeguard the resource for future local use and major events. We learned of no problems

or conflicts that would suggest these two events caused harm to the community. On the contrary, this study provided quantitative evidence that special events held on rail-trails produce positive economic and community benefits.

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PRIVATE BUSINESS PERCEPTIONS OF TRANSPORTATION ISSUES AND THE ISLAND EXPLORER BUS SYSTEM AT ACADIA NATIONAL PARK, MAINE

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Abstract: National Parks and communities that surround them often must work together to create the best possible experience for the visitors to the area. In the case of Acadia National Park in Maine, the surrounding communities and the park have worked together to face the issue of congestion in the area caused by too many automobiles. The Island Explorer Bus alternative transportation system was integrated in 1999 to begin dealing with this problem. This exploratory study was designed to assess the perceptions of private businesses on transportation issues in and around Acadia National Park and the Island Explorer Bus alternative transportation system. In-person interviews were conducted with managers or owners. The businesses included hotels, motels, campgrounds, bed and breakfasts, and in town stores. The results from the interviews will be used to assist in the planning of Intelligent Transportation System information to be integrated with the Island Explorer Bus alternative transportation system in late Summer, 2001. Also, the results will help with the design process of an in-depth mail survey of businesses on Mount Desert Island, to evaluate transportation and the Intelligent Transportation Systems technologies associated with the Island Explorer Bus system in late Summer, 2002.

Introduction

In 1999, over 280 million people visited the United States National Parks from all over the world to experience their historic and natural beauty, and the numbers are ever increasing (National Park Service, 2001). Yet, there is more to the experience than simply visiting these parks. While traveling to and from these gems of America, visitors encounter the numerous communities that surround the National Parks. As Lucas (1992) discusses, the National Park Service (NPS) must work cooperatively with these surrounding communities to create a positive overall experience for their many visitors. To ensure success of many park programs, the NPS must work closely with the

surrounding communities during the planning stages. The communities and their available amenities hold the power to attract visitors and promote the parks, as they have a great deal of contact with the visitors to the National Parks.

Part of the experience of visiting Acadia National Park, Maine, is the experience of visiting the numerous small coastal villages that are next to the park. Acadia National Park shares its main 32,000 acres with these multiple small villages on Mount Desert Island (National Park Service, 1992). The layout of Acadia is such that some of these surrounding small coastal villages share property lines and roads with the park. Because of this closeness, the National Park Service and their associated management actions must be mindful of these communities. Members of the surrounding communities and Acadia National Park Service representatives work together to satisfy the needs of each other and their many visitors. To further illustrate this, in 1998, the National Park Service conducted a general survey of Acadia National Park visitors (Littlejohn, 1999). One of the top reasons visitors reported for visiting Acadia was to also visit the surrounding villages, mainly for shopping and dining purposes (Littlejohn, 1999).

Each year almost 3 million visitors arrive at Acadia National Park (Daigle & Lee, 2000), and almost 4 million people visit the small surrounding community of Bar Harbor, Maine (McMahon & Propst, 1998). The small area of the park and the many visitors it receives each year makes Acadia among the most densely populated National Parks. In the Acadia National Park General Management Plan (1992), congestion of people and automobiles are discussed as areas that need to be addressed if the experience of the area is to be maintained. The management plan also notes that with the numerous cars parked on the sides of the roads, a safety issue is also of concern (National Park Service, 1992). Alternative methods of entering the park and working with the surrounding communities to begin solving the congestion problem were also stressed (National Park Service, 1992). Further supporting idea of congestion within Acadia National Park, in 1998 a general survey of Acadia visitors reported responses to open-ended questions regarding what visitors liked most and liked least about their trip to the park. The top four things that the visitors liked most about their trip to Acadia National Park were Beauty and Scenery, Scenic Views, Hiking Trails, and the Carriage Roads. The top four things that visitors liked least were Crowds, Traffic, Nothing, and congested parking. (Littlejohn, 1999). Again, the traffic, congestion, and crowding issues are still of concern to the park planners as they try to maintain the positive overall experience for their visitors.

In 1999, Acadia National Park, with the help of several other state and federal government agencies, the Friends of Acadia, and the surrounding communities on Mount Desert Island, introduced the Island Explorer Bus alternative transportation system into the park and onto the island as a means to address the congestion caused by too many automobiles on the roads (Daigle & Lee, 2000). The bus system began service with 9 buses along 6 routes, and

attracted 142,260 passengers (Daigle & Lee, 2000). In Summer 2000, the Island Explorer Bus ran 17 buses along 7 routes, and carried 193,057 passengers throughout Acadia National Park and the island (Crikelair, 2000). The bus runs each day during the summer months, from the last week in June until Labor Day in September. The idea behind Island Explorer Bus system is to change the travel behavior of visitors to Mount Desert Island, from a private vehicle based behavior to an alternative transportation behavior, such as using private or public buses, which are both available options on the island. The Island Explorer is primarily designed to allow visitors to leave their personal vehicles at their lodging facility, yet still have the ability to move freely about the island. While working alongside the many private transportation providers, the Island Explorer Bus system can keep Acadia National Park and Mount Desert Island accessible.

The Island Explorer is a voluntary use, free shuttle supported by donations from the local communities and organizations, local private businesses, and the federal government and Acadia National Park. Once again, the relationship between the National Park and the surrounding community must be strong to support this program. According to the responses on the 1998 general visitor survey, 74% of the respondents that spent their nights on Mount Desert Island stayed in the local villages, at hotels, motels, bed and breakfasts and campgrounds (Littlejohn, 1999). These visitors may not have contact with a park employee each day of their stay, but they will have contact with these lodging facilities. The continued success of the Island Explorer Bus system relies on the satisfaction of these local businesses, lodging facilities and villages, as they have the power to promote using the bus system and make donations to keep it cost free to its users.

The Island Explorer Bus system found increasing success over its first two years of service; yet, the planners recognized a need to make the system more attractive and effortless for the visitors. The integration of Intelligent Transportation Systems was determined to be the best way to do both. Intelligent Transportation Systems are technological innovations that will allow the distribution of Island Explorer information to the visitors, such as bus location and driver communication, to be more efficient (Batelle, 2000). The most important of these new technologies, for the visitors, are the Traveler Information Services. Traveler Information Services will allow area visitors and Island Explorer users to access information regarding the bus schedule, arrival times of each individual bus, and parking availability status in certain areas within the National Park. The components of the Traveler Information Services include electronic display boards for the bus arrival times and the parking availability information, interactive video display screens that will monitor certain Acadia National Park parking lots and track the Island Explorer buses, a web link from the Acadia National Park homepage, and a telephone accessible menu of all of these information options (Batelle, 2000).

To ensure the Island Explorer Bus alternative transportation system is continuing to meet the needs of Acadia National

Park, the surrounding communities, and the visitors, several studies are being conducted regarding the Island Explorer service. This exploratory study was designed to assess the perceptions of private businesses, which surround Acadia National Park, regarding transportation issues and the Island Explorer Bus system. In-person interviews were conducted in Fall, 2000, and the results will assist the planning for the new Traveler Information Services, to be incorporated late Summer, 2001, and to develop a more extensive survey of the businesses on Mount Desert Island in late Summer, 2002, and future assessments of the Island Explorer Bus service.

Methods

The purpose of this study was to determine the overall perceptions of the local businesses regarding the benefits of alternative transportation to the business environment, the benefits to their customers, and the traveler information needs of their customers on Mount Desert Island. In order to identify the issues and concerns of these businesses, in-person interviews were chosen as the method of data collection.

The interview schedule was developed at the University of Maine, Parks Recreation, and Tourism program, and was then reviewed and revised by Batelle, an independent research firm, and an advisory planning committee, which included local town planners, park staff, and a local consultant. There were four topic areas included in the interview schedule. The first topic area included the background information of the businesses, such as how long the person had been in the business and whether the business operated on seasonally vs. year-round, the size and location of the establishment, and characteristics of the customers, such as the types of customer groups. The next topics addressed were the awareness and use of the Island Explorer, such as how the customers or business found out about the Island Explorer or if they actually used the bus. The third topic area included benefits to the businesses and their associated customers. The final topic area included what traveler information the participants thought would be important to the businesses or their customers. The questions for these topic areas were asked in an open-ended format. This allowed the respondents to discuss their feelings and perceptions of the problems and issues addressed in the interview. "Yes" or "No" answers could not always be avoided in response to the questions, and probing questions were used to help guide the conversations. The goal here was to collect information that would eventually be used to inform the visitors of the area and change the transportation behavior of customers to fewer automobile drivers and more bus riders.

Purposeful sampling was used to select the businesses using the AltaVista™ Internet search engine "yellow pages" directory. Businesses were first selected based on type of establishment, campground, hotel, motel, bed and breakfasts, or in-town shop. The second criterion for selecting a business was its location on Mount Desert Island, attempting to get a range across the island. Twenty-five businesses were initially selected and contacted by

phone. Of those, thirteen answered and were invited to participate in the study. Of the thirteen businesses contacted, one declined due to a busy schedule. The interviewees included the owner or manager of the establishments, which, in some cases was the same person.

Most businesses, especially lodging establishments, are at their full capacity until after Labor Day. Therefore the in-person interviews took place in late September and early October, after the busy summer season but before most businesses close for the winter months. The times of the interviews were scheduled around the businesses to make the interviews as convenient as possible; they lasted between 25 and 30 minutes.

Permission to record was granted by the interviewees at the beginning of each interview, than a tape recorder was used to record the interview. Tape recording the interviews along with brief note taking was used, rather than only note taking, to allow all of the interviews to be captured at a steady pace. Each business was given a code to protect their identities and ensure their confidentiality. The interviews were then transcribed using a transcribing machine, by the interviewer. The transcription process provided the opportunity to do an initial analysis of the interviews before they were analyzed for specific themes, which found additional themes than initially sought by the interviewer. The interviews were then examined for the specific recurring themes in the responses to the sets of questions, such as the idea that there is a transportation problem on Mount Desert Island and in Acadia National Park, and if there is a difference in the types of customer depending on the month of the tourist season.

Results and Discussion

Characteristics of the Business and Their Customers

The general characteristics of the businesses varied between type of establishment, size of establishment, and location. Type and sizes of businesses were one, 200+ room hotel; three, 50+ room motels; three, 6-8 room bed and breakfasts; three, 100+ site campgrounds; a small locally owned gift shop and a larger chain store. The majority of the businesses were located on the eastern side of Mount Desert Island, and several were located on the northern and southern parts of the island as well. Two of the businesses operated year-round and the seasonal businesses lasted from around mid-May until the mid to end of October. Almost all of the businesses reported full capacity in July and August and about 75% capacity in June, September, and October.

The participants reported a difference in the customer base depending on the time of the season. They determined in May and June, their customers were primarily local residents or in the area to attend a conference or wedding. During the busiest part of the season, from mid-June until Labor Day in September, their customers were mostly families. And, after Labor Day, the customer base consisted of local residents along with touring customers that were primarily older and possibly retired. When asked

what they thought about the different types of customers, one participant responded:

Yeah, it's usually July and August, but June is turning [busy], with weddings and seminars, and this year September is looking real good as well, I think that when repeat people come to the island, 'cause they know July and August is such a zoo here, [they] start coming in September. So, we're finding that from Labor Day to Columbus Day, and fall foliage, we're pretty much set at capacity.

Another responded:

Sure, they [September and October Customers] are touring customers, you know, retired, sightseeing, as opposed to July and August, which are family, June is definitely conference.

One implication of this changing customer base is that there may need to be different types of alternative transportation available for the diverse customers. Currently, the Island Explorer Bus system is the only public transportation system, and as one participant noted, "...you have to take your own car. Or, if not, you have to use your legs, or feet, or use a bike; there really isn't much as far as public transportation." The Island Explorer Bus also only runs during the busy season of families, in July and August. The other customers of June, September, and October, must find alternative transportation from private providers, such as commercial tours of the park, or they have to use their personal automobile, which is what the Island Explorer Bus system is trying to discourage. A possible extension of the season with different types of service was mentioned by several businesses and may be needed to promote use among all of the visitors to the Acadia National Park area.

Customer Awareness and Use of the Island Explorer Bus System

This topic area began with a brief discussion of the Island Explorer Bus system, which all of the businesses knew of and some had actually used the bus. During this discussion, the participants were asked if they thought there were any transportation issues, such as problems caused by too many automobiles, on Mount Desert Island. Only one motel participant did not think there was a transportation problem on Mount Desert Island, however, the participant indicated it was his first summer on the island. One bed and breakfast was aware of a traffic congestion and parking availability problem in the adjacent village, but did not think there was a transportation problem within Acadia National Park, as she had never heard of one. However, the rest of the businesses felt that there was a definite problem of too many automobiles on Mount Desert Island, including within Acadia National Park. The majority of responses were as follows:

I think the traffic is going to be here no matter what.

Oh, I think it's a big problem. I think that the roads weren't made for this traffic, I mean, certainly, there are no lights, you don't see one for crossing! I mean, someone must get run over...

...if someone was to stay here, and left their car, there is still another car to take its place. It's like water, always going into a space.

There was an agreement by all of the businesses that if the customers hadn't used the Island Explorer Bus the previous year or were new visitors, they were probably unaware of the bus prior to contacting the establishment. All of the participants reported their businesses advocated using the Island Explorer Bus by handing out schedules or helping their customers plan visits to Acadia National Park using the bus. There was some concern however, that the businesses were doing most of the advertising for the bus system and the Island Explorer planning committee needs to do, "A little more publicizing."

...for the first people just coming in, we always gave them the information when they were registering. Most of them, nine out of ten didn't know anything about the service, it was new.

I doubt they know before they get here.

They come in and ask us where they should go to hike. We tell them about great one-way hikes to do using the bus. It's good for bikes too.

Every business reported that not many of their customers used the Island Explorer Bus. A couple stated that it was hard to convince their customers to use it because they had already planned on using their private vehicles.

...maybe a couple, as far as I know. Not too many of them left their cars here.

I'd say 1 or 2% use the Island Explorer, a lot of them have rented cars...and their out for a few days, so they've already had their vehicle, and the traffic is the traffic that they thought.

Certainly I notice a difference in the number of cars left in the yard...in the fall, the yard is empty during the day. In the summer, when the bus is running, maybe a third, a half, or more are here. They leave the cars and ride the bus.

Although not many visitors seemed to be aware of the Island Explorer Bus system prior to their arrival on Mount Desert Island or at the business, the small percentage of people using the buses can make a difference. As the years progress, and more businesses speak to their customers about the Island Explorer Bus and more repeat customers return to use the bus, the numbers of Island Explorer Bus users will inevitably increase. The few businesses that were unaware of transportation congestion problems on certain parts of Mount Desert Island and in Acadia National

Park may be indicative of many more. Outreach efforts by Acadia National Park representatives may help to inform the local businesses of these transportation issues, which can then be passed along to the customers and promote using the Island Explorer Bus to avoid these transportation congestion problems. Along with additional outreach to the local businesses, the Island Explorer planning committee may indulge in increased marketing to the visitors to the area to increase the public awareness of the Island Explorer Bus system and the need to use it.

Benefits to Businesses, Customers, and the Environment

Multiple benefits of the Island Explorer Bus system were identified by the businesses. Several of these benefits were synonymous with benefits identified in the Daigle and Lee (1999) survey of Island Explorer Bus users. Participants in the interviews identified a benefit to the customers, such as not having to drive their own vehicles and find parking. The 1999 Island Explorer user survey respondents identified "Less worry about driving and parking" as the number one desired and attained benefit of the Island Explorer Bus and "Rest from driving own vehicle" as the fourth (Daigle & Lee, 2000).

But even people who have cars like to ride the shuttle. Its just so, its an easy way to see the area.

...that they don't have to move their motor home. It's very convenient, very simple, they can use it to put their bicycles on, go around the park...

As far as transportation for our customers, downtown is always a problem with parking.

Other benefits identified in these in-person interviews were benefits to the customers of not drinking and driving if they have a cocktail or wine while in town or at dinner, as one motel phrased it,

We feel that, people if they want to go downtown to have a couple of beers or a glass of wine or something, they don't have to drive.

Benefits to the environment, such as taking some cars off the road and the cleaner fuel burned in the buses were also identified by the businesses as a very important benefit. Some of the participants had very strong feelings about the numbers of cars on Mount Desert Island and in Acadia National Park. Some of the resounding responses were:

You know, less traffic, less pollution, I just think that they shouldn't let so many cars into the park.

Just what it does for the environment, by reducing the amount of cars and traffic. Also just making the island more accessible.

Over the years, I've seen the pollution increase. I've seen the cloud gray over the island. It just gets worse and worse every year. And if this is

someway, anyway to control it, I would like to see the integrity of the air here better.

Few if any benefits that directly impacted the businesses could be identified. The businesses that had an Island Explorer Bus stop on their premises felt that the bus was an additional attraction to their customers, such as this campground owner,

I can tell the public in my web page, or on my flyer, we are a shuttle stop, we are a bus stop. It really helps... It hasn't effected how much business I get, because I am still, we are still full, even though business was up this year, I was still quite full. It just made it easier for people here to get around the island.

Finally, a benefit identified for all three, the customers, environment, and the businesses, was the possibility of attracting more carless visitors to Mount Desert Island.

Yeah, people that come over on the ferry. Motorcycle people, but mostly people that would be hikers, people that come across on the ferry, that are here for a few days, and looking for transportation.

A lot of people that arrive just in their motor homes, those are usually the ones that really appreciate the shuttle service.

The Island Explorer Bus system provides many overall positive benefits to the business customers. Although the bus system may not increase the numbers of customers that the businesses attract, it has the potential to diversify the customer base, such as attracting more carless visitors. The idea that there would be fewer cars on the road due to the increased use of the Island Explorer Bus is a benefit to Mount Desert Island residents and Acadia National Park users, such as less traffic congestion and increased parking availability if a personal vehicle is required. The benefit to the environment, like less air pollution, benefits the business environment and the customers by allowing for a better quality of life; if the quality of life is ruined by air pollution, businesses may choose to locate elsewhere.

Ideas about Traveler Information Services

The topic area dealing with important traveler information was especially important because it will help to plan for the new Traveler Information Services that will be initiated in late Summer, 2001. Most of the businesses had never really given much thought to the possibility of using technologies, such as video or electronic display signs, or a telephone information system, to relate information to the visitors during their stay. The businesses agreed that important information to include in the Traveler Information Services would be parking availability at certain busy areas in Acadia National Park and Island Explorer Bus arrival times.

You know, I never thought about that. It's kind of a good idea really.

Any bit of information we can get them is better.

Some of the businesses were skeptical that the Traveler Information Services would be used by their customers, and would probably not help to change the transportation behaviors of their customers. Many of the businesses felt that their customers were going to go where they wanted to go, on Mount Desert Island and in Acadia National Park, regardless of traffic congestion and parking availability.

They got there anyway.

They may, but as I say, my clients have a plan.

Providing this information to the patrons of these establishments did not seem to be a high priority for the respondents, they did not think that it would have much of an impact on their businesses. However, some businesses agreed there was a possibility that additional information on alternative travel routes using the bus could convince the visitors to leave their personal vehicles at their lodging facility. A few of the businesses felt that providing information on the arrival times of the buses could make the service more efficient and attract their customers to use the Island Explorer Bus system. Still, the businesses seemed to think that information on Acadia National Park was the most important.

Conclusion

As the interviews progressed, there seemed to be differences in the perceptions of the interviewees based on the type and size of business, how long the interviewee had been involved with the business, and the location of the business. The smaller businesses, the longer established businesses, and the businesses located on the northern and southern parts of Mount Desert Island seemed to think there was a bigger overall congestion problem, of people and automobiles. They tended to send their visitors to the less populated and congested areas in Acadia National Park. The larger businesses and the ones on the eastern side of Mount Desert Island, seemed to have more customers using the Island Explorer Bus and sent their customers to more populated areas in Acadia. Overall, the businesses thought that the Island Explorer was a positive addition to Mount Desert Island and Acadia National Park. They felt that there were definite benefits to their customers and the environment, and even a few to their businesses. Each participant had their own idea about what the new Traveler Information Services would be like. Traveler Information Services could complement the parking availability information with alternative travel plans into Acadia National Park using the Island Explorer Bus. They all felt that it would be an interesting addition to the Island Explorer Bus alternative transportation system, and were eager to see it in action the coming summer season.

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Management Decision-making & Planning for Outdoor Recreation

INTEGRATING RESOURCE, SOCIAL AND MANAGERIAL INDICATORS OF QUALITY INTO CARRYING CAPACITY DECISION MAKING

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Abstract: As use in national parks and related areas continues to rise and visitors and types of activities continue to diversify, we are challenged to balance use and preservation in parks, wilderness and related areas. Faced with these challenges, integrative approaches to defining, monitoring and managing ecological, social and managerial setting attributes is crucial. This research outlined in this paper has two objectives. The first objective is to inventory and map selected ecological, social and managerial setting attributes that define wilderness quality in Yosemite National Park. Using GIS technology, overlay maps of these setting attributes will assist in determining the types and distribution of wilderness experiences, associated ecological impacts and concomitant opportunity zones for the wilderness portion of the park. The second objective is to evaluate relative tradeoffs among wilderness setting attributes. Evaluations of these tradeoffs will be analyzed and will allow management to decide how to best mitigate recreational impacts while not hindering, to an unacceptable degree, the freedoms and other qualities often associated with wilderness experiences.

Problem Statement

As use in national parks and related areas continues to rise and visitors and types of activities continue to diversify, we are challenged to balance use and preservation in parks, wilderness and related areas. This challenge forces managers and researchers to address both ecological and social issues when making management decisions. In park and wilderness management, integrating social and resource indicators is essential to meet park mandates that require the protection of both experiential and resource conditions. This paper will address the challenges we face in integrating social and resource data and outline a study in progress in Yosemite National Park. This study will develop and apply a management model that integrates resource, social and managerial indicators of quality into carrying capacity decision-making.

Historical Background

Yosemite National Park is in the Sierra Nevada mountain range of California. The Park is approximately 1200 square miles and is known for the sheer cliffs of Yosemite Valley, its rugged snowy mountain peaks and its high mountain meadows. Inspired by the writing of John Muir, the painting of Albert Bierstadt and the photographs of

Ansel Adams, visitation to the park has been on the rise since its inception. In Yosemite National Park wilderness use peaked in the early 1970s at approximately 200,000 visitor nights per year. Use quotas established in the mid-1970s helped to reduce that number to approximately 120,000 visitor nights through the 1980s and into the 1990s (van Wagtenonk, 1979; Boyers, 1999). However, use is currently on the rise again (Cole, 1996; Boyers, 1999). Along with increasing use trends come associated ecological and social impacts. Management decisions must now be made about the number of visitors and associated impacts that can ultimately be accommodated within Yosemite National Park wilderness.

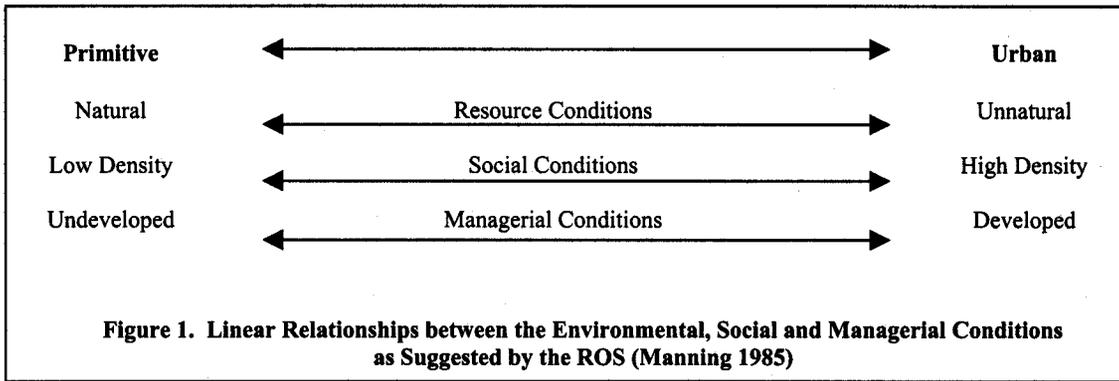
Conceptual Background

When facing these management challenges we look to frameworks to help organize our thoughts and set management objectives. Two prominent management frameworks in the recreation management literature are the Recreation Opportunity Spectrum (ROS) and carrying capacity.

ROS is a land classification framework developed during the late 1970s (Clark & Stankey, 1979; Brown, Driver, & McConnell, 1978; Brown, Driver, Burns, & McConnell, 1979). ROS is comprised of land classification categories that describe an array of recreation opportunities ranging from primitive to developed (Clark & Stankey, 1979). Within the ROS framework, recreation opportunities are defined by three characteristics: the resource setting, the social setting, and the managerial setting.

ROS can be a powerful allocation and planning tool that facilitates the inventory of diverse recreation opportunities. It assumes that linear relationships exist between each of its three setting attributes: resource, social and managerial. Alternative combinations of these setting attributes define recreation opportunities that range from primitive to urban. For example, primitive recreation opportunities are defined by natural resource conditions low density social conditions, and undeveloped managerial conditions (Figure 1). ROS has been adopted by federal land management agencies and is used in the planning and management of wilderness and related outdoor recreation (Buist & Hoots, 1982).

Traditional concern over the impacts of increasing recreation use has given rise to the concept of carrying capacity. In its most generic form, carrying capacity refers to the amount and type of recreation use that can be sustained in a park, wilderness or related area (Stankey & Manning, 1986; Shelby & Heberlein, 1986; Graefe et al., 1984; Manning, 1997). The literature on carrying capacity – like ROS – suggests that recreation experiences be considered within a three-fold framework of concerns: resource, social, and managerial. For example, the number of visitors that an area can accommodate is dependent on the resistance and resilience of the resource, the type of recreation activity taking place and the intensity with which an area is managed.



Research and management experience suggests that carrying capacity can be determined only when management objectives are defined, and that management objectives should be formulated and expressed in terms of indicators and standards of quality (Frissell & Stankey, 1972; Manning et al., 1996; Manning, 1998; Manning, 1999). Indicators of quality are measurable, manageable variables that define the quality of resource conditions and the visitor experience (Manning, 1999, Merigliano, 1990). Standards of quality define the minimum acceptable condition of indicator variables, or what is often termed the "limits of acceptable change."

The above frameworks provide a conceptual foundation for research to support an integrative approach to wilderness planning and management in Yosemite National Park. They suggest that planning and management of wilderness recreation must consider resource, social and managerial attributes, and that indicators and standards of quality should be developed for these attributes.

Analytical Integrative Models

Several models have emerged from the resource management literature that might help to make wilderness management and research more integrative in nature. For example, environmental impact statements (EIS) are used to assess the potential impact a management action may. An EIS mandated through the National Environmental Policy Act (NEPA 1968) combines social and ecological analyses, and findings are displayed within one report. Although this approach is integrative in nature, it is more multi-disciplinary than inter-disciplinary. An EIS model lacks the analytical power needed to fully address the relationships between social and ecological conditions.

Spatial analysis conducted using geographic information systems (GIS) gives us a tool in which we can begin to consider relationships between biophysical characteristics of a resource and a variety of social information. Traditionally, only resource data have been geo-referenced within GIS systems. However, GIS has the capability to incorporate social data as well, thereby facilitating a more integrative analysis.

Tradeoff analysis is another approach to integration. It is likely that most visitors want as unimpeded access to the

wilderness as possible, but also want such areas protected from excessive resource impacts, want to avoid undesirable levels of crowding and congestion, and want minimal management restrictions. However, these conditions often conflict, and tradeoffs must be made among these conditions. Such tradeoffs can be explored through a number of empirical approaches, such as stated choice models. Stated choice models allows us to understand the relative importance of resource, social and managerial condition/ attributes from the standpoint of the visitor. Stated choice models have been developed in marketing research to measure consumer preferences and tradeoffs among such preferences (Louviere, 1988; Green et al., 1988), and have recently been extended to applications in non-market and environmental policy contexts (Opaluch et al., 1993; Dennis, 1998). A trade-off analysis is an integrative approach that focuses on the cognitive relationships among resource, social, and management conditions.

GIS and stated choice analysis will be used as integrative frameworks in this study. Stated choice analysis will be used to determine preferred tradeoffs among resource, social and managerial attributes of the wilderness experience and these and other study data will be analyzed and reported using a GIS framework.

Study Objectives

The purpose of this research is to develop and apply a management model that integrates resource, social and managerial indicators of quality. More specifically, the study has two objectives. First selected ecological, social, and managerial setting attributes that define the quality of wilderness experiences in Yosemite National Park will be inventoried and mapped. Using GIS technology, overlay maps of these setting attributes will assist in determining the types and distribution of wilderness experiences and concomitant opportunity zones for the wilderness portion of the park. Second, relative tradeoffs among wilderness setting attributes will be evaluated. Optimum levels of ecological, social, and managerial setting attributes may not be able to be achieved simultaneously. In such cases, tradeoffs must be made among these attributes. Visitor-based evaluations of these tradeoffs will be analyzed and will inform wilderness planning and management decisions.

Study Methods

This study will be conducted in the wilderness portion of Yosemite National Park. A principal research method will be a survey of wilderness users. Sampling for the visitor survey portion of this study will be conducted in and around the wilderness permit stations in Yosemite Valley, Tuolumne, Wawona and Hodgdon Meadows. The sampling universe will include all persons receiving a wilderness permit during the summer use season of 2001. A stratified random sample will be selected from the sampling universe. The sampling season will begin on June 26, 2001, and end on Labor Day weekend 2001.

The research will be conducted in two phases corresponding to the two study objectives described above. The first phase of research will inventory and map selected setting attributes of wilderness experiences in Yosemite National Park using GIS. Setting attributes will be defined

in terms of indicators and standards of quality, and will address ecological, social, and managerial components of wilderness experiences. Examples of indicators and standards of quality to be included in the study are shown in Table 1.

The indicators were chosen using a modified delphi design (Sackman, 1975). Workshops were held in Yosemite National Park during the fall 2000 with researchers and over a dozen park managers and rangers. Over 30 potential indicators were discussed covering resource, social and managerial dimensions and managers were asked to vote for the indicators they believed were the most pertinent and feasible. Based on a literature review and continued discussion with management in Yosemite National Park, six indicators were chosen to represent the social, resource and managerial conditions of Yosemite wilderness (Table 1).

Table 1. Indicators to Be Utilized in the Study

Component of Wilderness Experience	Indicator of Quality
Ecological	1. Signs of human use at campsite (e.g., size of barren core, root exposure). 2. Signs of stock or stock use (e.g., trail impacts, tree scars, manure).
Social	3. Trail encounters. 4. Camp encounters.
Managerial	5. Availability of permits. 6. Camping regulation (e.g., designated campsites to freedom to camp anywhere).

Data on these indicators will be obtained through a visitor survey. This survey will be conducted as a "diary" where respondents will be asked to trace their daily route of travel and report and evaluate aspects of their wilderness trip as it is experienced on site. In this way, resulting data will be spatially referenced. Respondents will be asked to judge the existing quality or standards of selected indicator variables and to report the desired standard of quality as well. Resulting data will be coded into a GIS database that will allow development of coverages displaying the current and desired condition of all indicator variables.

The second phase of research will address visitor evaluations of tradeoffs among competing setting attributes or indicators and standards of quality. These tradeoffs will be explored through a visitor survey and application of stated choice models. The questionnaire will contain batteries of questions designed to enable the application of the statistical procedure of stated choice analysis. A standard research design involves assigning a range of performance levels to selected product or service attributes, then developing alternative scenarios that represent permutations of such attribute levels. Respondents then rate their preferences among scenarios and resulting data

indicate which attributes are most important. In the context of wilderness recreation, indicators and standards of quality can be substituted for performance levels of product or service attributes as shown in Table 2. In this example, a range of three standards of quality have been specified for each of six indicators of quality representing the resource, social, and managerial components of wilderness recreation experiences. Respondents will be asked to rate the desirability of a subset of scenarios representing the full universe of possible permutations, and resulting data, through application of stated choice analysis, will be used to estimate the relative importance of each indicator and standard of quality. Study findings can inform management decisions concerning appropriate tradeoffs among the setting attributes of wilderness experiences.

Integrating Study Findings

Several conceptual and analytical frameworks will be used to integrate the resource and social data collected in this study. Importance-performance analysis is a framework that can be used to help formulate indicators and standards of quality (Martilla & James, 1977; Hollenhorst & Gardner, 1994). The framework is illustrated in Figure 2.

Table 2. Yosemite Wilderness Setting Attributes and Levels

<p><u>Resource conditions</u></p> <p>Signs of human use at camping sites: Photograph 1 (low impact) Photograph 3 (medium impact) Photograph 5 (high impact)</p> <p>Encountering stock or signs of stock use: Never encounter stock groups or signs of stock use. Encounter stock groups or signs of a minority of days. Encounter stock group or signs of stock a majority of days.</p>
<p><u>Social conditions</u></p> <p>Number of other groups encountered per day while hiking: Encounter fewer than 5 other groups a day while hiking. Encounter 5 –15 other groups a day while hiking. Encounter more than 15 other groups a day while hiking.</p> <p>Opportunity to camp out of sight and sound of other groups: Able to camp out of sight and sound of other groups all nights Able to camp out of sight and sound of other groups most nights Able to camp out of sight and sound of other groups a minority of nights</p>
<p><u>Management conditions</u></p> <p>Regulation of camping: Allowed to camp anywhere. Allowed to camp anywhere in a specified zone. Required to camp in an assigned site in a specified zone.</p> <p>Chance of receiving an overnight back-country permit: Most visitors are able to get a permit for their preferred trip. Most visitors are able to get a permit for at least there second choice trip. Only a minority of visitors are able to get a back-country permit.</p>

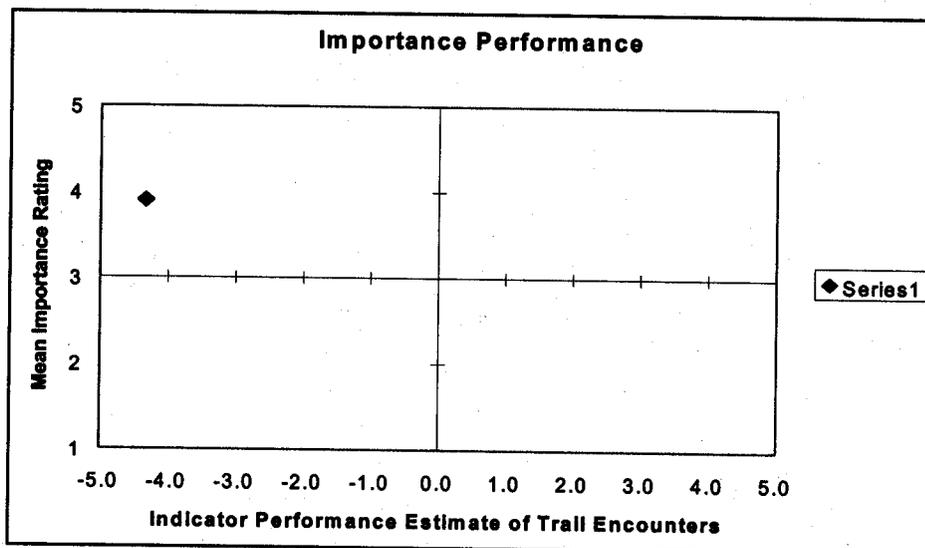


Figure 2. Example of Importance-Performance Framework

The vertical axis plots the importance that visitors place on resource, social and managerial indicators of quality and the horizontal axis plots the perceived or preferred condition of each indicator relative to its current condition. The resulting data provide a graphic representation of the relationships between importance and performance of indicator variables, and where management action is needed. Study data derived from the stated choice model

will be used as the measure of the importance of indicator variables and study data derived from the visitor diary will provide data on the preferred condition or standard of quality for the indicator variables. The algorithm shown in Figure 3 will then be used to integrate importance-performance measures for all resource, social and managerial indicators of quality.

$$\sum I_{1 \text{ IPE}}(W) + I_{2 \text{ IPE}}(W) + I_{3 \text{ IPE}}(W) + I_{n \text{ IPE}}(W)$$

W= importance weight from stated choice model.
Indicator Performance Estimate (IPE) = Actual – Preferred/ Standard Deviation of Preferred

Figure 3. Algorithm Used to Estimate the Overall Condition on an Area Using Social and Resource Indicators

This algorithm will generate an overall condition score for any geographic area within the wilderness portion of the park, and these data can be analyzed and reported within a GIS framework. Study data and the GIS framework will 1) allow for the creation of a map of priority areas in need of resource and/or social mitigation, 2) provide an informed basis for formulation of indicators and standards of quality for all wilderness zones, 3) inform selection of wilderness management prescriptions of highest utility to wilderness visitors, and 4) provide a tool for monitoring resource, social and managerial indicators of quality.

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REDEFINING ROLES OF SCIENCE IN PLANNING AND MANAGEMENT: ECOLOGY AS A PLANNING AND MANAGEMENT TOOL

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Abstract: Science as a way of knowing has great value to decision-making but there is need to consider all its attributes and assess how science ought to be informing decision-making. Consideration of the critiques of science can make science stronger and more useful to decision-making in an environmental and ecological context. Scientists, planners, and managers need to consider the critiques of science and ecology, and examine how science can adapt and incorporate these critiques into the application of science and decision-making. This paper outlines many of the challenges facing the use of science (specifically ecology) in decision-making and shows possible areas for overcoming these challenges.

Critiques have questioned the following assumptions of science: 1) whether it is value-free, 2) concepts of order and predictability and 3) modern science's claim to being the key way of 'knowing'. Challenges have also been issued to the application of science such as: 1) the simplistic causal mechanisms used and 2) the lack of consideration for complex interactions and multi-scale issues. Science can be seen as a process of understanding rather than as a collection of facts. As a process, knowledge is changeable and adaptive, precautionary approaches become vital.

Ecology is a science that is beginning to recognize the need for value identification, the need for a multi-scale and multi-perspective approach. Ecology itself requires a multi-disciplinary systems approach. Solutions provided by ecology should stress relative merits instead of absolute answers. Rather than being viewed as a 'weak' science may be the most useful science and tool for dealing with environmental problems that are complex, multi-scale, and cannot necessarily be solved by reductionist measures alone. Ecology and the philosophy of science can be shown to advocate an adaptive precautionary approach given the complexity of social and bio-physical interactions.

Introduction

Questions abound regarding the roles of science in planning and management decision-making. These roles are debated at many levels and generate diverse responses. Two examples of these responses have stemmed partially from

post-normal science and post-modernist critiques. Post-normal analysis evaluates assumptions of linear causality in a quest for unerring predictability and control of nature; the implications of these assumptions are also examined. Post-modernists indicate that science is relative and, as such, the predominant use of science as a key mode of "knowing" may be fundamentally misguided when it is applied to decision-making. These insights, among others, are helping to redefine a role for science that appears to coincide with a new era of planning that includes a civics model, precautionary principles, and an ecosystem approach.

Despite emergent models of the use and definition of science, current management and planning may not be able to easily incorporate redefined concepts, nor experience the ideals represented by those models. In short the adaptability of institutions to these concepts remains questionable (Holling, 1995; Kay et al., 1999). The conceptual jumps required may be too great for current practices to deal with, as often, theoretical ideas lack the means for pragmatic implementation. Finding a middle ground for the role of science that can allow adaptation of these new concepts may be required. Despite numerous arguments from scientists, planners, managers, and academics that planning and management should be more science-based, these new models advocate a defined role for science set within a well established construction of social values and objectives to guide both the planning and management process.

Ecology, a key science in environmental decision making, provides an opportunity for scientists, planners, managers, politicians, and all of society to reshape interactions with the natural world. Many use ecology as a scientific tool to support desired decisions and as a means of understanding human impacts on the environment. Ecology is also used in attempts to transform ecological concepts into ethical, prescriptive stances (Callicott, 1986). While I agree with many of these attempts, and understand the need to adopt an ecological perspective, there is an equal need to consider what ecology, and specifically what ecology as a science, actually has to offer society. This process starts with an understanding of what is meant by science, followed by descriptions of what shapes ecology.

Critiques of science suggest that science, as a way of knowing, may be seriously misguided when it is applied to decision-making in an environmental and ecological context (Funtowicz & Ravetz, 1994; Schneider & Kay, 1994a). Scientists, planners and managers need to appreciate the critiques of science and ecology, and examine if, and how, science can adapt to incorporate such critiques into the application of science in decision-making. These critiques may be particularly salient for recreation research as many of the models for recreation planning and management are based in assumptions of scientific method.

Poor use of science includes simplification of diverse social contexts for planning and management as reflected in such models as Limits of Acceptable Change, Recreation Opportunity Spectrum and others. Secondly, biophysical impact assessments, monitoring, and carry capacity

considerations make simplistic assumptions (linear, mechanistic causality) about the bio-physical world (Schneider & Kay, 1994a). These models often do not, and possibly cannot, grasp the complexity of social and ecological systems in order to provide for effective, beneficial, and long-term decisions. A brief look at some of the characteristics of environmental and ecological problems helps explain the difficulty of planning and managing in social and ecological domains.

The Nature of Ecological Problems

Ecology, in its most general form, is the study of changing interrelationships between organisms and their biotic and abiotic environments (Loeb et al., 1998; Schneider & Kay, 1994a). Studies of ecology occur at multiple levels of interaction but no matter what the level, it is important to remember that each level is influenced by, and in its own turn influences, interactions and processes at other levels (Loeb et al., 1998). The diversity of interactions in ecology has created such concepts as emergent complexity (Schneider & Kay, 1994b), multiple scales and non-linear dynamics (Holling, 1992) that require approaches beyond the mechanistic, reductionist methods often used in a Newtonian-portrayed, modern science (Slocombe, 1998; Schneider & Kay, 1994a). Because of inherent uncertainty and movement away from traditional approaches, ecology is often seen as being a weak science, as intractable, messy, and unpredictable (Slobodkin, 1988; Peters, 1991).

Much of the reason for the "messiness" and conflict with ecology has emerged because of the following: the types of problems that it has been asked to solve (Slobodkin, 1988); the types of questions that ecology, in turn, is forced to ask (Grumbine, 1992; Schneider & Kay, 1994a); and the nature of the social settings in which these problems are being asked (Walters & Holling, 1990; Holling, 1995). On the environmental movement front, concern over ecological problems were motivated by analogies between the dynamics and complexities of ecological systems and human societies and a concern to plan and manage human societies within their ecological context and constraints (Slocombe, 1998).

Similarly, ecology was being asked to address problems in various resource industries (forestry, fisheries, etc.) where the scientific concepts traditionally used were not providing accurate predictions and resulting ecological disturbances were causing considerable economic problems (Gunderson, Holling, & Light, 1995). Global population growth and resource crises shaped ecological problems primarily as problems of scale. Decisions made at one particular scale created problems at multiple scales and often hidden at the scale of the initial implemented decision. Reactions to the new problems often focus, again, at only one scale (Norton, 1995) rather than attempting to view a complete scaled system.

Additionally, an ecological problem could depend largely on popular perception (Slobodkin, 1988). People will care for what they see and not necessarily think about what they definitely know. The popularity of cute, furry species or

majestic landscapes as symbols for environmental groups illustrates this dynamic and these symbols often become the focus of concern rather than root ecological problems and knowledge. Recognizing this, Slobodkin (1988) is quick to point out that solutions to environmental problems depend as much on the power of poetry and arts, as on economics, while the techniques of carrying out the resolution hinge on ecology. That is to say that environmental problems and perceptions of environmental problems have at least two aspects to them: value statements of what is desired and ecological understanding, explanation, and definition of what might be possible.

Ecological problems manifest themselves as multi-scale problems, require multiple types of perspectives (nutrients, populations, landscapes, etc.) and do not appear to be adequately solved using traditional linear, mechanistic approaches to scientific understanding. As well, a complex social dynamic merges with this bio-physical reality such that ecological planning and management of environmental and ecological issues requires acknowledgement of social values. Defining socially desired goals for an ecosystem is quickly becoming an important aspect of planning and management. In this form, ecology is a science that challenges much of the core modernist approaches to science.

What is Science?

Science is first and foremost a philosophy of understanding and learning. As a philosophy it shapes the process by which we go about learning and understanding the world around us. Its strength lies in its search to acquire knowledge that has the greatest likelihood of being true (Goldsmith, 1993). Science, as a philosophy and in practice is also subject to critique from diverse arenas of society. One notable critique portrays science as manifesting perceptions of today's world as normal, simplistic and unchanging (Goldsmith, 1993). Others suggest that science's claim to neutrality (or being value-free) is impossible and that the introduction of values to science invalidates scientist's work. A brief explanation of the philosophy of science helps to explain how some of these critiques are not necessarily critiques of the philosophy of science but rather of the practice of modernist science.

Biggins (1978) suggests that science is about our views on the possibilities for using nature, the constraints on our using nature, and our relationship to nature or, in short, it is about understanding the human-environment interaction. Science is a form of logical investigation about the how things work. Popper (1994a) would argue that science is about rational criticism; through discussion of ideas, knowledge and understanding can be furthered. This is an important distinction as society, decision-makers, and indeed many scientists and researchers, have established science as a static and concrete collection of facts and predictive tools rather than as a process of learning.

For Popper (1994a) and other scientific philosophers (Peters, 1991; Callicott, 1986), science is defined by the

following: investigating the world by creating conjectures or hypotheses (problem creation); testing the hypotheses and developing evidence (hypothesis testing); and presenting the train of thought (or theory) to critical examination by both the proprietor of the theory and by others who wish to examine and test the theory (critique).

Problem creation is arguably the least understood component of the scientific process but remains a crucial component of the scientific endeavour. In theory, researchers examine the literature about other theories and weigh out the relative merits of different methodologies, theories, and ideas, in an attempt to establish some new theory or direction for research. In practice however, it has been shown that researchers often turn a blind eye to the diversity of theories, instead focusing a smaller set, in attempts to provide evidence to strengthen their own theories or "pet" ideas (McIntosh, 1980). At a basic level, problems are tensions between knowledge and ignorance; they are imperative for the progress of knowledge (Popper, 1994a). The hypothesis creation phase develops the questions or discovers the problem to be researched and then creates ideas (conjectures) about the possible reasons for the existence of the problem. Problems may arise when we look at the world and perceive differences between observation and perception. That is to say, that the art of creating hypotheses may be a largely internalized process in which we mix our ideas of how things work with previously discovered phenomenon, other research, and our observations (Peters, 1991). As such, a hypothesis is formed which makes formalized statements about how the world might work, in preparation for a formalized testing of these statements.

From problem creation, the next phase is to test hypotheses. Hypothesis testing is perhaps what scientists do best. There are well established procedures and protocols for the multitude of tests that need to be done. They range from statistical sampling protocols to established tools and measurement techniques, most developed in attempts to reduce researcher bias. Testing is done by comparing deduction to observation (Peters, 1991). The original theory is tested by whatever means of observation are available and relevant. A positive test of a hypothesis proves only that in the context of the test, the theory is correct. It does not prove that the theory will be correct in all cases. Indeed, Popper (1994b) suggests that even the most rigorously tested theories will always be conjectures and hypotheses. This means that a new hypothesis can and should be created which can be further assessed against others. Popper (1994b) argues that we regard one hypothesis as better than another if, when testing is complete, it fulfils three requirements:

- 1) the new hypothesis must explain all the things that the old hypothesis successfully explained;
- 2) it must avoid at least some of the errors of the old hypothesis;
- 3) it should, where possible, explain things that could not be explained or predicted by the old hypothesis.

This amounts to the basis of the scientific critique and is how scientific understanding constantly evolves (Funtowicz & Ravetz, 1993).

Critical examination of theories follows this process and provides further problems for examination. Popper's form of critical discussion is in actual fact the explaining of a new theory, in light of, and better than an old theory. We have already seen this in his explanation of the three parameters by which an old hypothesis is rejected for a new one. But what is necessary is to know if a new theory would be considered acceptable. For Lee (1993), "an experiment is a systematic way of answering a question. Whether the results constitute a valid answer is a test of the competence of the experimenter."

In order for results to constitute a valid answer, internal and external validity must be made (Lee, 1993). Internal validity might be described as correct inferences: those considerations and decisions made in the course of developing and testing a hypothesis. According to Lee (1993), internal effects to experimental validity occur due to: the following factors: historical events, events that would have occurred anyway, flukes, effects caused by the experimenter, results that occurred because of measurement tools, and decisions of sampling. These factors consist of all things that would effect and bias the answers due to the experiment itself.

External validity constitutes whether the results can and are correctly applied to other situations (Lee, 1993). Threats to external validity generally take the form of changes to the subject matter, because of measurement, such that replication is not possible. Some examples include: multiple interventions causing non-linear changes, and complex interventions which are not repeatable due to failures or impossibilities in including those components actually responsible for the effects (Lee, 1993). Lee realizes that the approach offered may prove too idealistic but suggests that insisting on an idealistic approach to science does not entail refusing to do science unless it is invulnerable to criticism. Rather, it entails approaching a problem scientifically. For Lee (1993), evaluating internal and external validity provide an orderly framework in which to make assessments about the objectivity of an experiment and hence of a theory.

Schrader-Frechette and McCoy (1993) make an argument for what constitutes the objectivity of ecology that applies equally well to science in general. Ecology can be objective, not because it is empirically confirmable, but rather if it is not obviously biased or subjective. They define the objective result as being obtained through survival of intelligent debate and criticism, and if it appears to have more explanatory power and internal and external validity than alternative theories. They argue that objectivity is not tied to value-free confirmability but tied (as Lee [1993] also suggests) to the practices and procedures of intelligent criticism of the scientific community as well as to the practices and procedures of the methods used. Popper (1994a) would concur with these statements adding that, "to attain objectivity we cannot rely

on the empty mind." Objectivity rests on criticism, on critical discussion, and on the critical examination of experiments. A right and wrong method of critical discussion emerges. A wrong one would start with the question: How can we establish or justify our theory? This leads, Popper argues, to dogmatism. By contrast, the right method of critical discussion starts with: What are the consequences of our thesis or our theory? Are they all acceptable to us?

Because science is a process of learning, knowledge should be seen as changeable. Current theories and predictions may change dramatically with new knowledge and may not be appropriate to address future problems. The philosophy of science may necessitate an adaptive approach with a cautionary use of knowledge. This becomes even more important when we consider uncertainty, complexity, surprise, and social conflict in ecological problems.

Post-Modernism and Post-Normal and How Ecology and Science Can Respond

Many ecologists and decision-makers demand a more rigorous science, with greater predictability and understanding (Peters, 1991; Szaro et al., 1998). Such simplistic demands are seen, by Kay and Schneider (1994a), as the classical Newtonian cause and effect, modern scientific approach. The post-modernist critique challenges the fact-value dichotomy portrayed by modern science, the concept of order and predictability from a reductionist perspective, and the notion that science is the only way of knowing.

The knowledge and understanding that science is not value-free is not new; objectivity in science is perhaps questionable. Post-modernists insist that science like other intellectual disciplines is influenced by the social and political context within which they are embedded (Tauber, 1999; Howarth, 1995). Benson and Licht (1997) suggest that the experimental method of science often portrays results as supporting or refuting a hypothesis instead of focussing on the possibility that the methods used might be mistaken or lead to errors. This is a valid concern and scientists should be prepared to analyse and critique the methods used, assumptions made, and thus the relevance and objectivity of the outcome.

Despite these efforts by scientists, it is still argued that the very methods, models, and theories used, presuppose a set of values (Howarth, 1995). These values are often depicted as the modernist values of mechanistic control and domination of nature. Questioning this, Masters (1993) questions the importance of the critique that science might be value-laden. Tauber (1999) suggests that considerations of neutrality versus objectivity help to break this argument down. Objectivity can be maintained through the philosophy of science and its methods (as described earlier), whereas the scientist or the science may not be neutral. Tauber suggests that neutrality of science "depends on regarding nature as holding no value". Neutral science would not take a stand, while objective

science has claims to reliability. As such, objectivity is an ideal to be attained through a process.

If, however, the argument still rests on whether science can indeed be objective, it may be useful to think of objectivity and subjectivity on a continuum with the two at opposite ends. Knowledge shifts along this continuum. Perceptions of environmental problems consist of varying degrees of factual concepts, desired ends and varying degrees of objective information. Lee (1993) suggests that perceptions of individuals and collective human populations can be disconnected from reality under certain circumstances. These may be seen as "optical illusions" or situations in which the ideas and inferences people create are systematically mistaken. Often, these perceptions could be so strong as to have problems wished into reality; a more subjective rendition of knowing. Norton (1995) points also to individual perception as geared toward short-term changes rather than long-term perspectives demanded for parts of ecological understanding. Perceptions have considerable importance for decision-making. They influence allocation of funding and political and societal focus, possibly moving focus away from what is really at stake in the broader ecosystem. The role that ecology has in these situations is to create more objective ideas of what is needed for greater sustainability. Modern science should not posit that it is value free and completely objective. Rather, science has the capacity to be neutral, and more objective than not.

A second post-modern critique is that ecology in the modern scientific paradigm portrays nature to be ordered and structured and this leads to decisions that in longer timelines elicit greater surprise and uncertainty. Benson and Licht (1997) argue that under a post-modernist world-view, order and predictability are no longer possible, nor are they desirable. Schneider and Kay (1994) similarly argue that the Newtonian perspective of order and predictability cannot be used when studying ecosystems because of inherent complexity created through the number, and specificity of interactions. Despite these thoughts, this perspective does not preclude a modernist scientific approach to understanding the solution. Modernists are not necessarily stuck within the "universe is ordered and predictable" paradigm and the world-view of ecology is shifting away from such simplistic assumptions (Norton, 1995; Holling, 1986, 1995; Schneider & Kay, 1994a).

A further line of thought is that reductionist science cannot possibly explain ecosystems, however, modernist science is inherently reductionist, even in its attempts at holistic understanding (Trepl, 1994; Goldsmith, 1993). Goldsmith, (1993) rejects the ecologist who would attempt to reduce things in models of understanding, arguing instead that nature can only be understood holistically. While I agree that making models to encompass all of the complexity of natural systems may not be possible, holistic research methods and ways of knowing are not abundant and can be cumbersome and time-consuming to implement. As 'parts', a reductionist approach will always be incomplete, but necessary. Taken in stride with the philosophy of

science which forces contextual understanding, the proprietor of the model should no doubt understand the implications and short-comings of the model and seek a more holistic understanding of the context of their work; both holistic and reductionist methods are needed. Arguably, many scientists do not seek to merge the two.

The final post-modernist critique to be addressed here is regarding science's claim as the only way of knowing and further that knowing is impossible because knowledge is dependant upon the individual, their culture, their environment, etc. Certainly there has been a tendency for policy and decision makers to seek out scientific information and to diminish other types of information. This is understandable in a world which searches for and demands confident answers to problems. Jasanoff (1993) relates one post-modern position, that suggests that in a world where policy outcomes are largely determined by social relations, scientific knowledge serves only to underpin particular group or class interests, lending them the appearance of objectivity. This coincides well with a view that most citizens claim science has become an obstacle to the expression of concerns (Irwin, 1995).

Science as knowledge, is often used in conflicts to gain power. Science is portrayed as the only valid way of knowing and as such, alternatives lose credibility and standing in decision making. Popper (1994a) refutes this, arguing that ideas should be put forward as much as possible and should be able to operate freely against the narrowness of a 'scientists' perspective. Popper argues directly that science is only one way of knowing and operates within a certain finite realm. But, be prepared to defend other ways of knowing against critical discussion. The solution to 'science as power' is more difficult but lies in social uses of science and also in the critical discussion of the merits of each groups' particular scientific "facts". The application of post-normal science is perhaps one method for broaching the issue of multiple valid ways of knowing.

On the surface, there may be little that separates a post-normal critique from a post-modern critique. In fact it might be argued that post-normal critiques are a subset of post-modernist perspectives. Perhaps the two largest differences are that post-normal is mainly a critique of 'normal' science, and that post-normalists would not disallow a dominant use of science but rather frame the use of science more appropriately. More basically, I would argue that post-normal critics create a more explicit understanding of what science ought to be about and how science ought to influence decision-making. To that extent, post-normal science critiques are as follows: Funtowicz and Ravetz (1993) suggest that this emerging science attempts to manage uncertainty rather than eliminate it; make values more explicit; and creates scientific argument through interactive dialogues rather than formalized deduction. Further, they suggest that temporal and spatial characteristics are very important for discussing explanations and that historical perspectives and reflection of humanities past and future are relevant and necessary.

Normal science is claimed to be a science that in the modernist perspective has oversimplified the understanding of nature. What is often forgotten is that theories and scientific models are merely representations of reality and as such are inherently flawed. In this perspective any action taken will have errors and any actions that were based on previously accepted simple models, will have more errors and if adopted, create greater surprise (Holling, 1986). Ecology as depicted by Kay et al. (1999) requires understanding of complex systems, emergent properties, self-organization, spatial and scalar interactions, and self-organization (to name a few concepts) demanding a different paradigm than that of Newtonian objective and detached science (Norton, 1995).

Funtowicz and Ravetz, (1994) suggest that an appreciation of the diversity of knowledge systems can lead to a new practice of science in emergent complex systems. They suggest that as uncertainty increases and/or as decision stakes become higher, science, as it is traditionally practiced, loses some of its applicability and validity. There is no set boundary to indicate when science is appropriate or not, but rather the boundaries shift given different types of problems available knowledge, and conflicting interests among interest groups. In this form, post-normal science does not preclude the use of traditional science but rather places boundaries on it. Post-normal science does not appear to really be questioning how science is done (as does post-modernism) but rather questions the role that science plays in diminishing uncertainty, and gaining control over a given problem. Post-normal critiques address how science is used in the decision making process; a warning that scientific information can easily be taken out of its context and applied in ways that it was either not intended for, or applied where the information does not grasp the full complexity of a situation.

Post-normal science also speaks to the use of caution in high stake/uncertain situations. This is similar to the cautionary stance portrayed by the philosophy in science that knowledge is temporary, and will be replaced with new and hopefully better knowledge, from which actions may change. Decisions regarding ecological problems should be seen as relative merits or tradeoffs rather than based on solutions determining right and wrong. Thus, the role of ecology, according to Schneider and Kay (1994) should be about demonstrating the relative merits of different possible actions; ecology should provide explanations about tradeoffs.

The goals of ecology are frequently questioned. Many critics argue that the goal is to seek control over nature. Others claim that the goal of ecology is to gather information in an objective a manner as possible. Funtowicz and Ravetz (1993) suggest that science should have a more explicit goal in aiding decision-making and that definition of this goal should be discussed openly. The difficulty with complex systems and with deciding between tradeoffs is that it requires definition of values and thus the goal for the system. Schrader-Frechette and McCoy (1993) suggest that ecology has no clear norms for when a

community is normal or healthy and, as a consequence positing a goal for ecological practice is quite difficult. There is considerable debate about whether an objectively defined state can be determined by science that can be used as the goal for ecological systems. This debate perhaps provides the greatest distinction between the modernist scientist and the post-normal scientist. Modernists would claim that such an objective goal could be determined from science whereas the post-normal scientist would suggest that describing a state where an ecosystem 'ought' to be is a value based question, one which requires discussion among groups interested in that particular ecosystem.

Summary

Schrader-Frechette and McCoy (1994) suggest that, if it can be established that protection from serious harm is more basic than providing or enhancing welfare, then the goal of ecology is one of precaution. Various historians and ecologists perceive that some parts of the ecological viewpoint are at odds with the modern scientific conceptualization of nature, so that ecology might well provide a framework which could override and require fundamental revision of some existing patterns of scientific thought. Thus their writings suggest that the emergence of ecology might herald the emergence of a "new science" (Biggins, 1978). If modern science is defined purely as Newtonian science (simplistic linear prediction) then ecology as a science moves us away from modern science. If modern science is defined as providing purely objective and unerring predictive capacities (in the empirical sense), then ecology creates an understanding that this view of modern science is not possible.

However, given the philosophy of modern science outlined briefly in this paper, ecology attempts to be and mostly is, a type of modern science. That is, ecology in many respects, represents the ideals of modern science philosophy, and yet challenges those ideals. Mirroring the philosophy of science, ecology has the capability to develop ideas (theories) about how the world functions. In ecology, that world often includes humans and multiple spatial and temporal scales of understanding. These theories need to include a conceptualization of the complexity of the natural world and provide predictive statements (narratives) about likely outcomes and limits or constraints of application of the theory under question (Kay & Schneider, 1994; Norton, 1995; Holling, 1986). These theories are held up for critical debate. Indeed, there is considerable debate regarding ecological theory and its application (Peters, 1993; Schneider & Kay, 1994, 1993; Bocking, 1978; Holling, 1986; Gunderson, Holling, & Light, 1995).

In addition to critiques, any number of environmental problems could be viewed as testing grounds for ecological theory (diversity-stability debate, genetically modified organisms, sustainability, global climate change, etc.). A science that recognizes that knowledge is changeable is a science of caution. Any actions that result from use of science should recognize that new and complex situations will likewise require cautious application of science. Concepts underlying adaptive management frameworks

seek to institutionalize this debate allowing for action as opposed to the paralysis that is often felt in a purely political debate of uncertainty. And, it allows for alteration of theory when theories prove not to provide accurate explanations of ecological understanding. Last, ecology may be viewed as moving beyond the traditional modernist perspective as it evolves to include explicit definitions of values in order to help the science develop various narratives of policy outcomes.

When critiques of modern science are offered, there is a need to understand all that is being critiqued. Too often, a theory is used to critique practice, rather than another theory. The practice of science by scientists and its use by decision makers may have faults. Reasons for this are not merely a result of the science, but also representative of a societal evolution. Science has considerable sway in a society that looks to science for answers. This is both a phenomenon of science and of society. The theory of science may also be faulty but in its limitations it provides a more objective means of understanding the natural world than many other approaches to gathering information. It is not the only knowledge set that should be consulted but its predominant use in decision-making and policy creation suggests the need to improve the science that is influencing these domains.

Ecology is a science that recognizes the need for value identification, the need for a multi-scale and multi-perspective approach, and requires a multi-disciplinary systems approach. Solutions provided by ecology could stress relative merits instead of absolute answers. Rather than being viewed as a 'weak' science, ecology may be the most useful for dealing with environmental problems that are complex, multi-scale, and cannot necessarily be solved by reductionist measures alone. Ecology and the philosophy of science necessitates an adaptive precautionary approach given the complexity of social and bio-physical interactions. To continually improve our use of tools such as science, we need to consider its critiques, explore their validity, and incorporate them into application. Ecology as a key science and perspective in decision-making is well placed for this endeavour.

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Impacts of Wildlife Viewing

ELK VIEWING IN PENNSYLVANIA: AN EVOLVING ECO-TOURISM SYSTEM

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Abstract: In 1997, the Pennsylvania Game Commission established an Elk Viewing Area within Pennsylvania's elk range. The viewing area has become the focus for a developing eco-tourism system. During the four years of operation, a research team from Penn State has measured the number of visitors, their expenditure patterns, and other parameters of their visit. The trends observed during this period provide a useful insight into an evolving eco-tourism system.

Introduction

Elk, *Cervus elaphus canadensis*, were indigenous to Pennsylvania before the late 1800s. However, the original herds were extirpated by 1877 (Shoemaker, 1939), largely because of unregulated hunting pressures and the wide-scale harvest of the state's forests.

The resurgence of second growth hardwoods throughout much of the state during the early 1900's gave cause for the re-introduction of elk to the new forest system. From 1913 to 1926, 177 Rocky Mountain elk (*C. e. nelsoni*) were introduced to northcentral Pennsylvania (Bryant & Maser, 1982; Gerstell, 1936; Latham, 1954). A hunting season was established in 1923 and continued until 1932, when declining elk numbers caused it to be suspended. The remaining herd settled into Elk and Cameron Counties of northwestern Pennsylvania. Through a concerted management effort, led by the Pennsylvania Game Commission, the herd increased to nearly 300 animals by 1996. In its 2001 survey, the Commission identifies over 600 elk (Cogan et al., 2001).

The current success of these unique animals has not gone unnoticed by the public. In 1997, an elk viewing area was established on Winslow Hill, near the town of Benezette. Elk are a source of continued interest and pride among residents and visitors to their range (Strauss et al., 1999; Lord et al., 2000a). However with the expanded herd size, has come a call for reestablishing an elk hunting season. The Pennsylvania Game Commissions released its Elk Hunt Advisory Committee's report in April of 2000. That report supports the establishment of an elk hunting season (Cogan, 2000).

Prior to the announcement of the hunting season, Lord et al. (2000b) examined the opinions of visitors about an elk hunt. They found opinions split, with certain subgroups of the audience strongly for or against the concept.

Procedures

A series of random on-site interviews were obtained over the four-year study along the main road and observation site. Over 1,400 interviews were obtained during 155 survey days, providing information on visitor origins, travel plans, party sizes, expenditures, allied recreational interests and expectations.

Total attendance was developed from an allied system of vehicle counts taken along the main viewing road and observation areas. Vehicle counts were expanded to visitor days using passenger load and travel data obtained from the interviews. Two attendance models were developed, one which depicted daily use patterns and a second that analyzed seasonal trends, with the latter organized as triangular distributions (Strauss et al., 1999). These efforts provided annual estimates of total attendance on a weekly and monthly basis.

Expenditures were identified on a visitor day basis (one person's visit during some portion a day), classified by resident and non resident visitors, and further stratified as to the types, amounts, and locations of purchase. Total expenditures were developed from attendance estimates and were entered to an input-output model for the two-county region. The IMPLAN model provided the economic structure of the two-county region (MIG Inc., 1996). Non resident visitor expenditures were traced by the model in terms of their direct and secondary (indirect and induced) impacts within the region and were measured by total sales, value added, salaries and wages, and employment.

Results

Visitation

Daily visitation patterns show a pronounced seasonal variation in elk viewing. The prime viewing opportunities occur in the fall (September - November), during the elk rut, as the bulls are assembling their harems (Figure 1). The first two falls after the viewing area was established had peak usage of over 3000 people on some weekend days. At this level, both the viewing area and the associated road system were overwhelmed. By the third fall, these extremes were no longer observed, as visitation spread to the late summer (Table 1).

Table 1. Seasonal Attendances at the Elk Viewing Area

	Year 1	Year 2	Year 3	Year 4
Fall	35,781	49,461	38,094	42,820
Winter	3,225	5,506	3,715	3,331
Spring	6,993	5,621	4,672	
Summer	5,926	12,162	12,221	
Total	51,925	72,749	58,702	63,624

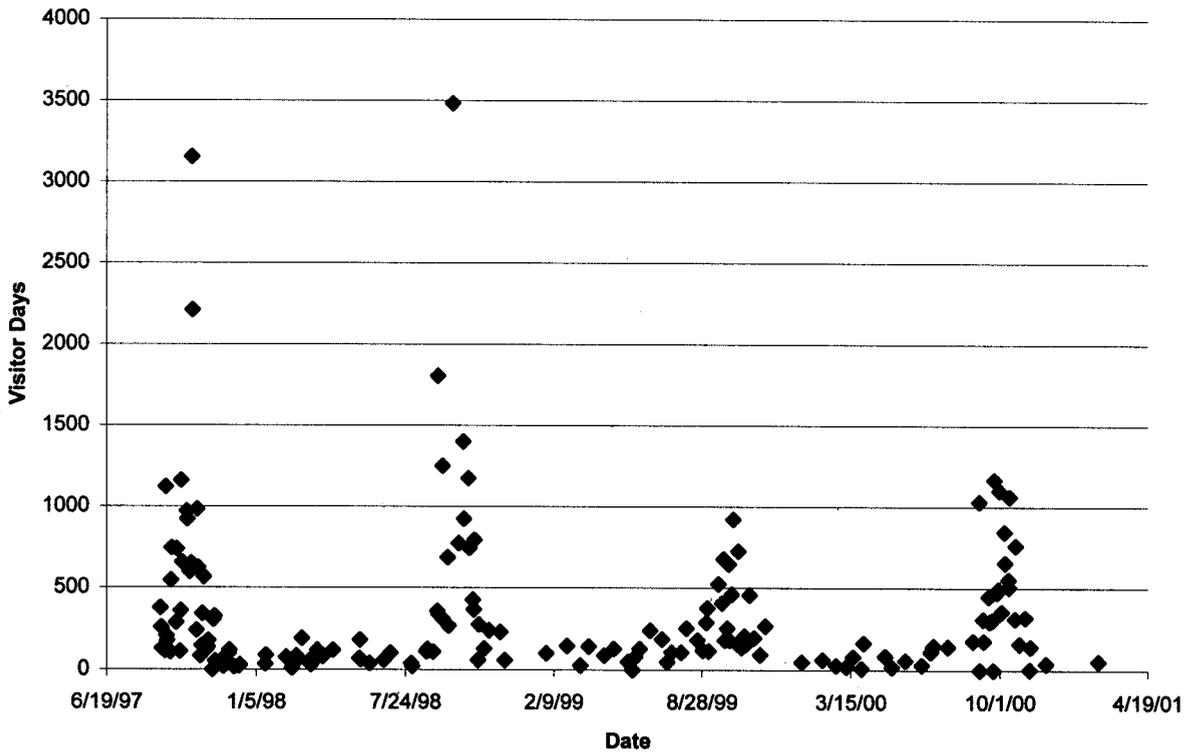


Figure 1. Daily Visitation Observed at the Elk Viewing Area

Overall attendance for the first year was just under 52 thousand visitor days. The second year saw significant increases in both the fall and the following summer seasons, for an annual total of over 72 thousand visitor days. In the third year, the fall attendance dropped back to the level observed in the first fall. Winter, spring and summer remained at about the same levels, with the third summer still significantly higher than the first summer. The fourth fall showed an increase from the third fall, though not as high as had been observed in the second fall. Total visitation for year four was estimated at 64 thousand visitor days. The spring and summer estimates were based upon patterns observed in previous years, rather than actual observations.

Resident visitation showed a definite peak in the second year with over 9 thousand local visitor days (Table 2). This was over triple any other year's resident visitation. Non resident visitation also peaked that year. Since the second year, resident visitation dropped steadily, while non resident visitation declined in the third year, but increased in the fourth.

Table 2. Trends in Resident and Non resident Visitation

	Year 1	Year 2	Year 3	Year 4
Resident	3,042	9,294	3,040	2,390
Non resident	48,883	63,455	55,662	61,235

Prior Experience

Starting with the second year, respondents were asked about the number of years that they had been viewing elk in the area. Overall, the average was 4.4 years, with a third of the visitors being first time elk watchers (Table 3). One year later, the average had increased by exactly one year (5.4 years), with one third still identified as first time visitors. The fourth year was differed significantly from the first two, with the average dropping to 3.8 years and over half of the people listed as first time visitors to the elk viewing area.

Non resident Expenditures and Economic Impact

During the first year that the viewing area was open, non resident visitors spent almost \$20 per visitor day (Table 4). Food (\$7.94/visitor day), transportation (\$5.27/visitor day), and lodging (\$4.03/visitor day) were the largest expenditure

Table 3. Prior Experience in Viewing Pennsylvania's Elk Herd

Study Year	Previous Visits (yrs.)	First Time Visitor
1998-1999	4.4	34%
1999-2000	5.4	32%
2000-2001	3.8	52%

categories. The next year, average expenditures dropped precipitously to \$8.66 per visitor day. Food (\$2.96/visitor day), transportation (\$2.89/visitor day) and lodging (\$1.96/visitor day) still lead expenditure categories, albeit at much lower levels. Expenditures increase in the third year (\$14.33/visitor day) and fourth (\$26.45/visitor day). Notable increases in year three were food (\$5.53/visitor day) and lodging (\$5.03/visitor day). In year four, food (\$9.20/visitor day) and lodging (\$8.90/visitor day) rose to new highs. Meanwhile, transportation expenditures (\$5.23/visitor day) also increased to the levels seen in year one.

The economic impacts follow directly from the expenditure levels and the number of non resident visitors. Total expenditures in year one were \$0.9 million (Table 5). In year two, even with increased attendance, only \$0.6 million was spent in the region. By year three, total expenditures increased to \$0.8 million, and in year four, it doubled to \$1.7 million. Total sales impacts followed the same pattern, \$1.2 million in year one, \$0.9 million in year two, \$1.1 million in year three and \$2.3 million in year four. Employment impacts in the two-county region showed similar trends over the four years (30 jobs, 21 jobs, 27 jobs, and then 54 jobs).

Hunting Opinion

When visitors were asked their opinions about a "limited hunt outside of the major viewing areas", a majority expressed approval. In the first three years, just over half approved (56%, 53% and 55% respectively) (Table 6). In the spring of the third year the Game Commission announced the details of a proposed elk hunting season. Hunting approval in the following fall rose to 67%.

Table 4. Non resident Expenditures for Elk Viewing

Season	Trans.	Food	Lodg.	Photo	Other	Tour	Total
'97-'98	\$5.27	\$7.94	\$4.03	\$0.20	\$1.58	\$0.40	\$19.43
'98-'99	2.89	2.96	1.96	0.32	0.49	0.03	8.66
'99-'00	2.79	5.53	5.03	0.06	0.89	0.04	14.33
'00-'01	5.23	9.20	8.90	0.36	2.76	0.00	26.45

Table 5. Economic Impact of Elk Viewing by Non residents

Category	Year 1	Year 2	Year 3	Year 4
Non resident visitor-days	48,883	63,455	55,662	61,235
Expenditures per visitor-day	\$20.23	\$9.38	\$15.00	\$27.17
Total expenditures	\$909 K	\$595 K	\$835 K	\$1,663 K
Total Impacts	\$1,235 K	\$873 K	\$1,134 K	\$2,259 K
Job Impacts	29.8	20.9	27.3	54.4

Analysis of Trends

Visitation

The establishment of a formal elk viewing area attracted large number of visitors to the region. Much of this usage was centered around the fall elk rut. Extreme crowding was observed on several weekends during the peak of the first two seasons. As the third year approached, a significant increase in summer visitation was evident, along with some reduction in the attendance on peak viewing days. Severe cases of congestion were no longer apparent. In year four, total visitations increased, though without extreme crowding. Prior to the fourth season, improvements had been made to the road system, including increased parking at key locations around the viewing area. It seems that after the second fall season, the visitors had learned of earlier congestion and spread their usage to both the early rut season and to weekday periods. Combined with improvements in the road system, overall visitation had increased without detracting from the visitor experience.

Expenditures and Economic Impacts

There are few opportunities to spend money in this rural area. Both food and lodging are limited in the immediate region of the elk viewing area. This was further aggravated in the second year when the town's only gas station temporarily shut down its pumps. As a result, regional gasoline expenditures declined and did not recover until one year after their return to service.

New businesses have appeared, including an "Elk Country Store," a wood carving shop, and a helicopter tour operator. The increase in miscellaneous spending reported in year four may be related to the increased opportunities. However, note that none of the viewers interviewed reported that they had taken a helicopter tour. Apparently, this latter service is either infrequently used or their clients don't mix with the more plebeian crowd on the ground.

Non resident expenditures dropped during year two followed by a steady increase in the next two years. In terms of economic impact, the low expenditures in year two were somewhat offset by the large number of non resident visitors. Increase impacts were observed in the subsequent years as attendance ebbed and then bounced back and average expenditures increased.

Table 6. Portion of Visitors Approving of a Limited Elk Hunt

Season	Percent Approving.
1997-1998	55.5%
1998-1999	53.4%
1999-2000	55.1%
2000-2001	67.3%

Hunting

During the first three years, opinions about and elk hunt were split, with just over half of the visitors approving of the concept. During the spring and summer prior to the fourth year, the details of a proposed elk hunt were announced by the Pennsylvania Game Commission. Following this, approval increased significantly with two out of three visitors approving. Earlier analysis found that perceptions of a small herd size and animals habituated to humans were the main reasons for disapproving of a hunt. The details of a formal elk hunting proposal seems to have alleviated some of these concerns.

Experience

Prior experience was tested to see if it was a significant predictor of expenditure levels and of opinions about an elk hunting season. A negative correlation was found when non resident expenditures were regressed against the number of years of elk viewing experience (Table 7). Visitors were found to spend \$0.33 less per visitor day for each year they had visited the region. Note that many of the people with a history of prior experience had hunting cabins in the area and consequently may have had fewer needs to make purchases during their trip. Visitors with more experience were more likely to disapprove of a hunt (Table 8).

Table 7. Relationship between Prior Experience and Expenditure Levels

Effect	Coefficient	Std Error	T	P (2 Tail)
Constant	20.452	1.747	11.706	0.000
Previous	-0.328	0.175	-1.873	0.062

Table 8. Relationship between Prior Experience and Opinions about an Elk Hunting Season

Parameter	Estimate	S.E.	T-ratio	P-value
Constant	0.582	0.106	5.497	0.000
Previous	-0.017	0.010	-1.674	0.094

Conclusions

The eco-tourism system tie to the region's elk viewing area is evolving as visitors become familiar with the opportunities offered. There also appears to be an adjustment in the usage patterns. Visitors are learning about the best viewing opportunities and how to avoid crowding. Simultaneously, local services are providing additional opportunities for these visitors. No doubt there will be successes and failures along the way, but the region appears to be developing a stronger tourism infrastructure. There are problems, including a continued lack of lodging places and visitor encroachments on private land. Perhaps

the biggest limitation is the concentration of visitors in the relatively short eight-week season centered around the elk rut.

The increase in new visitors suggests that local planners will have to attend to this growth. Furthermore, new visitors may have different desires and expectations than the more traditional elk viewer. They bring in new money and offer new opportunities. They also may have different opinions about the resource. Continued monitoring of the visitors and their needs is recommended as the system continues to evolve.

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COMPETING VALUES: A CASE STUDY OF PENNSYLVANIA'S ELK HERD AS A TOURISM ATTRACTION

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Abstract: This paper qualitatively investigates the Pennsylvania Game Commission's (PGC) "Elk Trap and Transfer Project" as a tourism development initiative. Beginning in 1998, a three-year trap and transfer project was initiated by the PGC to relocate 33 elk from Elk County to Clinton County. The ecological goals of this project included re-establishing an elk population that could once again support limited hunting opportunities and to address plausible negative repercussions of the significant annual growth the herd experienced in the 1990s in Elk County. The project has also led to an increase in the numbers of visitors to Western Clinton County interested in "elk viewing" experiences, and is reported to have stimulated local economies. The general consensus from recent research examining the economic impacts attributable to "elk viewing" in Elk and Cameron counties in Pennsylvania suggests that an escalated interest in Pennsylvania's elk herd has directly led to increased non-resident tourism in these two counties. These findings have supported the view that rural tourism development in northcentral Pennsylvania should be encouraged and expanded.

Amid an extensive body of literature related to rural tourism development, Middleton and Hawkins (1998) have advised that the management of local tourism destinations needs to be "proactive", focused towards identifying and addressing issues that could potentially become areas of conflict between different individuals and/or groups impacted by tourism development. One manner of being proactive and minimizing such conflict is to actively participate in "positioning" a given tourism development initiative in stakeholders' minds (cf. Crompton, 1999). A preliminary assessment of the current situation in northcentral Pennsylvania seems to suggest that the PGC's project to relocate and reintroduce elk into other parts of the state may have sparked some local discord or conflicts of interest. This paper attempts to investigate this dissonance from a case study methodology, paying particular attention to the relevance of the "positioning" concept to this dissonance.

Introduction

The management of the elk herd in Pennsylvania throughout the 20th century and into the 21st century has, at

times, been negatively impacted by competing values of local landowners and the Pennsylvania Game Commission (PGC). Documentation of this ongoing struggle can be found as far back as 1914, when the *Millheim Journal* (a local newspaper in central Pennsylvania) ran an article informing the public about a proposition to relocate elk for the purposes of reducing and minimizing the crop damage they caused and to improve tourism. It has been said that history repeats itself; perhaps this is why one can read about the same elk management proposition in a local paper some 80 years later. In September of 1996, the PGC announced that it had developed an Elk Trap and Transfer Project to address those very same issues mentioned in the 1914 newspaper article. For the last couple of years, local farmers and residents in northcentral Pennsylvania have been driving off or shooting elk, various groups have been supporting or condemning these locals, and the PGC has found itself in the midst of it all. The PGC's most recent three-year Elk Trap and Transfer Project appears to have ignited some local adversarial fires that, in turn, have spawned a significant amount of negative publicity for the PGC. The purpose of this paper is to summarize an investigation of this negative publicity from a rural tourism development case study perspective. More specially, the researchers have attempted to examine the importance of Crompton's (1999) *positioning* concept within the context of rural tourism development based on Pennsylvania's elk herd.

History of Elk Herd Management in Pennsylvania

Over 30 years ago, local farmers and residents in central Pennsylvania began demanding that the Pennsylvania Game Commission (PGC) do something with the "rogue", free-roaming elk herd in their part of state. In 1970, local citizens who were experiencing crop and/or property damage attributed to elk demanded that the situation be remedied. In support of the farmers and landowners, the Pennsylvania Federation of Sportsmen's Clubs and the Elk County Federation of Sportsmen's Clubs proposed that the PGC consider planting food plots in nearby fallow and deserted croplands to attract elk away from active farms in production. Almost simultaneously, the Cameron County Soil and Water Conservation District and the North Central Pennsylvania Economic Development Corporation suggested the establishment of a 10,000-acre elk management area in Elk and Cameron Counties primarily for tourism development initiatives and economic growth. In addition, the Northcentral Division Supervisor of the PGC at that time suggested that if the elk herd continued to grow an elk hunt might be in order. A direct outgrowth of these conditions was the "modern era of elk management" for the state of Pennsylvania.

It appears that little has changed with regard to the elk herd management over the last 30 years in northcentral Pennsylvania. It is once again "center stage" in newspapers, as citizens debate the *best practices* for managing the herd. The current situation precipitated directly from the PGC's three-year Elk Trap and Transfer Project, an important component of its current elk management plan to re-establish an elk herd that could once again sustain limited

hunting opportunities and provide "wildlife viewing" experiences. More specially, the goal of the PGC's 1996 Management Plan for Elk in Pennsylvania is,

...to recognize elk as a valuable wildlife resources, to perpetuate free-roaming elk, within suitable habitat for viewing and unique hunting opportunities, and to maintain elk population numbers that affected landowners will accept. (http://sites.state.pa.us/PA_Exec.PGC/elkhunt/02_hunt/eh20_01.htm, March 15, 2001, p.1)

To this end, 33 elk were released in western Clinton County (located in northcentral Pennsylvania) in February of 1998 in an effort to re-establish an elk population that could once again support limited hunting opportunities and to mitigate negative repercussions associated with a significant annual growth in the elk herd in Elk County during the 1990s. Prior to this date, the herd had already begun to migrate or drift out of its traditional range in Elk and Cameron counties in a southern direction and the PGC's plan simply hastened or augmented this migration to an area comprised a vast tracts of public lands (Clinton County). Thus, the PGC proposed that the "established" elk range in central Pennsylvania be expanded from an area where about one-third of the land is publicly owned and two-thirds privately owned to an area where just the opposite occurs—two thirds public and one-third privately owned land. In 1998, in conjunction with the Rocky Mountain Elk Foundation (RMEF), the PGC began its three-year Elk Trap and Transfer Project designed to trap elk in Elk and Cameron counties and transfer them to Sproul State Forest in Clinton County.

Although this project might have begun solely as a PGC resource management practice, it was highly touted as an opportunity to further develop and promote tourism experiences that could (should) eventually have positive impacts on the economies of several rural communities in northcentral Pennsylvania. In fact, recent research, conducted to examine the economic impacts attributable to "elk viewing" in Elk and Cameron counties in Pennsylvania, suggested that an burgeoning interest in Pennsylvania's elk herd has directly led to increased tourism in these two counties (cf. Lord, Strauss, & Tzilkowski, 1998; 1999). In addition, Lord, Strauss, and Tzilkowski (1999) found that, 92% of the visits associated with elk viewing were by individuals residing outside Elk and Cameron counties. It has also been estimated that in 1998, elk viewing contributed a value added component of \$912 thousand and created 42 additional opportunities for local employment. Preliminary results of an ongoing study by Penn State University have estimated that the elk range draws up to 75,000 visitors annually (93% of whom are Pennsylvanians), who collectively spend an estimated \$1.7 million in the region for transportation, food and lodging (http://sites.state.pa.us/PA_Exec/PGC/elk/index.htm). These economic statistics suggest that the elk of Pennsylvania may have the potential to significantly impact those rural communities seeking to stimulate and stabilize their respective economies through tourism development.

Tourism Development

The call for local and public participation in the process and planning of tourism development has become quite commonplace in tourism literature, essentially because of the advantages attributed to its inclusion in tourism planning. For example, Murphy (1985) has pointed out that local participation can serve as an integral component in the assessment of impacts of tourism development, provide a balance to short-term objectives in tourism planning, be a most effective tool in dealing with local tourism-related issues, and should be incorporated because the local level is where the "action takes place". This "public participation" should theoretically include all stakeholders, but at a minimum include both experts and those affected by development of tourism (Murphy, 1985). Murphy also explicitly points out that public participation should be included in the tourism planning process early, "...before commitments are made and battle lines are drawn" (p. 171). Inskeep (1991) claimed that local participation leads to both economic and social diversification, which he believes is a precursor to a more integrated form of tourism development, and ultimately to the establishment of a sustainable tourism development framework. From his perspective, a diversified, integrated approach to tourism development can "...minimize the impacts [of tourism] on local development patterns and local society" (p. 30). Edgall (1999) explained that local residents could impact the diversification of tourism development by affecting the levels of novelty, excitement, comfort, and security that visitors experience at the tourism destination. Gartner's (1996) statement that, "all impacts associated with tourism development occur first and with the greatest intensity at the community level" (p. 300), certainly implies that it is only *fair and just* that the local residents have a voice in tourism initiatives and development. Beliefs such as these appear to have been seminal to the development of tourism planning models over the past few years, especially those involved with rural tourism planning (cf. Lewis, 1998; Sem, Clements, & Bloomquist, 1996; Walsh, Jamroz, & Burr, 2001; Weaver & Wishard-Lambert, 1996).

Rural Tourism Planning

Almost by definition, rural communities are have been described as being more vulnerable to poor tourism development than other communities. These rural communities and their economies are more isolated, have fewer resources, and probably fewer options. In such communities, tourism can be very disruptive. Rothman (1998) contends that tourism development often results in "irrevocable change" for both the tourism destination and its residents. He believes that the loss of the very characteristics that make a place unique results from the fact that,

When tourism creates sufficient wealth, it becomes too important to be left to the locals. Power moves away from local decision makers, even those who psychically and socially invest in the new system that tourism creates, and towards outside capital and its local representatives. (p. 11)

Additionally, Rothman believes that tourism often “frays” community bonds, as it pits local special interest groups and individuals against one another, while they attempt to capture the economic benefits of tourism development. This is precisely why Middleton and Hawkins (1998) have advised that the management of local tourism destinations needs to be “proactive”, focused towards identifying and addressing issues that could potentially become areas of conflict between different individuals and/or groups impacted by tourism development.

While recognizing such a possibility, Burr (1996) believes that rural tourism can also provide an opportunity for greater community development, and he developed a conceptual model for facilitating rural tourism planning that he believes promotes such development (see Figure 1). Emphasizing the importance of establishing a supportive infrastructure for rural tourism development, Burr’s five-step process provides local stakeholders with a network of

social interactions, essentially creating communication patterns between groups and individuals that connect local input and feedback with the tourism promotion organizations prior to implementation of tourism initiatives.

While acknowledging that these individuals, communication patterns, and interactions will vary according to the specifics of the local area and the magnitude of the tourism scheme, Burr (1996) advocated involving a diverse set of participants in the process of rural tourism planning and development. His findings led him to conclude that private citizens, local leaders, business owners, elected officials, governmental agencies, special interest groups, and tourism planners and marketers all play key roles in the process of successful rural tourism development. The resulting social networks encouraged interactions at the local level, while at the same time, creating valuable ties to resources outside the local community. Connections to the “outside world” afforded

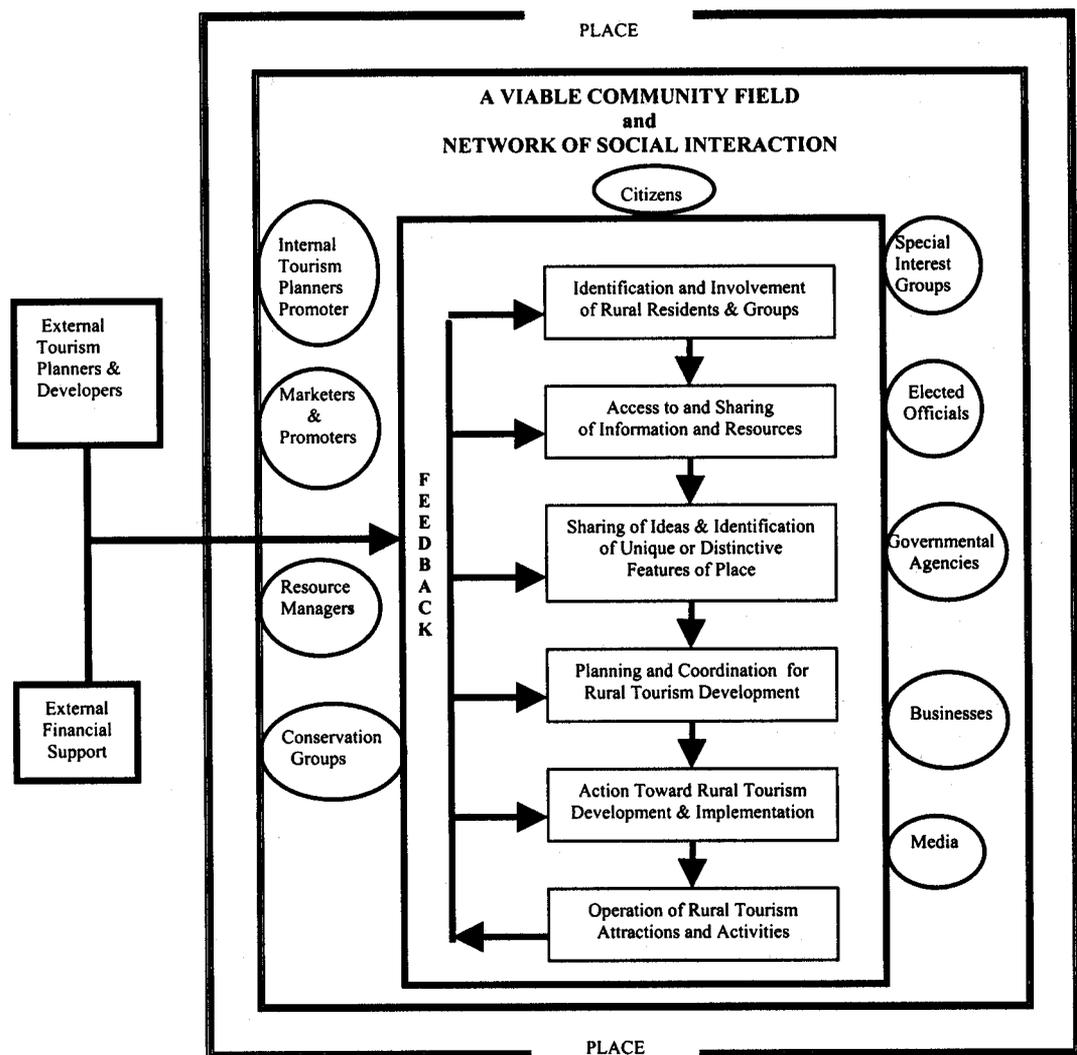


Figure 1. Burr’s Conceptual Process for Facilitating Rural Tourism Development

local communities' access to essential human resources, planning expertise, and financial support they might not otherwise have had, and can make significant contribution to a community's ability to become more agentic in its development strategies.

Of course, incorporating the perspectives of such a diverse set of stakeholders in rural tourism planning is no simple matter and is sure to result in the promotion and advocacy of a multitude of disparate personal and organizational agendas. Often times, the final product of such a process is dependent upon the success with which individuals, groups, and/or organizations *position* themselves and their respective goals in the minds of other stakeholders involved in the planning process (cf. Eyre & Jamal, 1998).

Positioning

Positioning, according to Crompton (1999), refers to the place that something or someone occupies in the minds of others. Differing from *image*, positioning relates to a frame of reference or a comparison to similar entities or alternatives. In the context of rural tourism development, where a diverse set of stakeholders have been incorporated into the planning process, the positioning of one's beliefs, perspectives, and/or ideas can significantly impact the amount of support or opposition for one's idea or viewpoint. In other words, if a particular tourism development initiative is positioned favorably in the minds of stakeholders, it will be supported over less favorably positioned alternatives. This is precisely why rural tourism planning models often begin with an assessment or an investigation of public opinion/attitudes or the general mood of the community; to better understand what *position* tourism development holds in the minds of community members (e.g. Bouke & Luloff, 1996; Lewis, 1998; Sem, Clements, & Bloomquist, 1996). Such investigations can provide tourism development advocates and promoters valuable insights as to how they might strengthen a current *position* or possibly *reposition* tourism development to garner more local support and/or minimize dissonance to such development. Crompton (1999b) also warns that, "repositioning is likely to take many years of effort..." (p. 5), and "...is a difficult task because it involves shifting a widely held, long established attitude..." (1999a, p. 113). This leads him to the assertion that the identification and establishment of a strong, preferred position can be the most important aspect of strategic planning. A lack of attention to *positioning* can often be a main cause of local dissonance associated with rural tourism development. In situations where two or more individuals, groups, and/or organizations have differing views on tourism development strategies, discord and friction increases as these entities compete for favorable *position* in the minds of other stakeholders. A better understanding of the influential role *positioning* can serve in rural tourism planning and development may help minimize the amount of the local dissonance and social disruption often linked to such development.

Methodology

Based on the fact that two local newspapers – the Lock Haven Express and the Renovo Record – frequently

published articles and editorials related to the PGC's management of the elk herd, the researchers chose to conduct a content analysis of both newspapers. Using a modified snowball approach within this content analysis, the investigators also found several other documents related specifically to the PGC's Elk Trap & Transfer Project. The main purpose of this investigation was to gather constructive information to document the process by which the PGC involved various stakeholders in the development and implementation of its Elk Trap and Transfer Project. More specially, the researchers searched for dates and locations of public meetings, workshops, seminars, etc., as well as evidence regarding who was invited and/or attended these venues. Documents were reviewed for pertinent information related to the following questions:

- What factors have contributed to the current public dissonance related to the PGC's Elk Trap & Transfer Project?
- Could this dissonance have been reduced or eliminated?
- Who are the key stakeholders of the PGC's Elk Trap & Transfer Project?
- What process did the PGC follow to implement its three-year Elk Trap & Transfer Project?
- How do the PGC's actions, related to this project, compare to the steps in Burr's (1996) Model for Rural Tourism Development?

This information was then utilized to construct a chronological timeline that included the date of the event, key contacts, purpose and outcomes of each meeting/event, and individuals and groups in attendance (see Figure 2 as example). It was anticipated that having developed such a timeline, the researchers could better identify key stakeholders in the Elk Trap and Transfer Project, as well as, better understand the comprehensiveness and inclusiveness of the planning process.

These stakeholders (individuals and groups) were then classified in accordance with categories contained within Burr's (1996) Model for Facilitating Rural Tourism Development in an attempt to correlate individuals and groups involved with the PGC's elk project and *types of stakeholders* identified in Burr's work. Finally, a minimal number of personal interviews with stakeholders were conducted in an attempt to verify the accuracy of the newspaper articles and editorials, as well as, the researchers' interpretations of these articles.

Findings

Over 200 documents and articles related to the PGC's Elk Trap and Transfer Project were reviewed, the vast majority of which were published between 1996 and 2000. The following individuals and groups were identified from these documents, and labeled as "stakeholders" in the PGC's Elk Trap and Transfer Project based on the fact that they either attended or sent representatives to meetings, contributed articles, and/or were invitees to specific events related to the project. These "stakeholders" have been classified into the following categories of stakeholders found in Burr's (1996) model for rural tourism planning.

HISTORICAL TIMELINE FOR THE PENNSYLVANIA GAME COMMISSION'S ELK TRAP & TRANSFER PROGRAM			
<i>Date</i>	<i>Source</i>	<i>Groups</i>	<i>Comments</i>
<u>1976</u>	Webpage	PGC Dept. of Environmental Resources' Bureau of Forestry (BOF)	Developed an elk policy directing the agency to improve elk range in Elk & Cameron Counties
<u>1982</u>	Webpage	PGC BOF Local farmers Sportsmen	Elk committee (sounding board – not a regulatory board)
<u>1990</u>	Webpage	Rocky Mountain Elk Foundation (RMEF) PGC	Donation of \$38,000 to purchase State Games Land 311 – 1,600 acres at Winslow Hill, Elk County for elk habitat
<u>1996</u> Sept.	Newsbrief	PGC	Developed their Elk Management Plan – 90 elk over a three-year period to be trapped and transferred to Clinton County Elk Field Tour to Benezette
Oct. 3	PGC memo	PGC County Commissioners Legislators	
<u>1997</u> Sept. 19	Express	Consolidated Natural Gas Corp (CNG)	Sponsored luncheon at Sportsman Restaurant, Renovo for stakeholders Public meeting announced for St. Marys, PA to discuss the Elk Management Plan and the feasibility of establishing an Elk Hunt. Also identified RMEF, Pennsylvania State University (PSU), Frostburg State University, and Purdue University as partners in the elk program.
Nov. 6	Express	PGC DCNR BOF	
<u>1998</u> Oct. 10	Express	Residents – Kettle Creek Valley	Petition of 50 residents opposed to a second release of elk in their backyards. Sponsored meeting in Cross Fork (Chapman Township) of 50 residents' presentation of petition of 79 people in favor of Trap & Transfer Program.
Oct. 21	Express	Clinton County Economic Partnership	

Figure 2. Elk Trap & Transfer Project Timeline

The findings also indicated that at least 33 meetings/events were held related to the PGC's management of the elk herd, the majority of which focused specially on its Elk Trap and Transfer Project. While many of these meetings were organized to increase the public's awareness of the PGC's on-going efforts to manage the elk, sessions also involved an assortment of public and private forums intended to: promote events, share research findings, planning future initiatives, manage conflict, and to gather public input.

The content analysis revealed that there was a substantial amount of local dissonance evolving from the PGC's Elk Trap and Transfer Project. This dissonance stemmed from competing values, those supporting the PGC's expansion of the elk range into Clinton County and those local farmers and landowners opposed to such efforts. Those landowners arguing against the project viewed the PGC's efforts to be in competition with their individual property rights as landowners. The PGC, on the other hand, described its efforts as beneficial to the general public, local communities, and in the best interest of the elk herd.

Conclusions & Implications

The implementation of the PGC's Elk Trap and Transfer Project appears to have acted as a catalyst to the unveiling of conflicting values within some local communities in central Pennsylvania. A comparison of the findings of this investigation with both the process, and the stakeholder groups, within Burr's (1996) conceptual model for rural tourism development reveals genuine similarities. The most obvious difference is that while the PGC appears to have integrated the vast majority of Burr's stakeholders in the **implementation** of this project, it failed to include a significant group of local residents and citizens from the initial **planning** of the project. It is easily discernible from newspaper articles that this project has illuminated a local dissonance involving the PGC's elk trap and transfer project. Although some local dissonance is inherent to the development of rural tourism in an environment of disparate values, evidence in this case study suggests that the PGC developed and implemented an elk management strategy that incited a significant amount of public controversy, a consequence of the clashing of stakeholders' competing values.

Governmental Agencies & Groups

PA Game Commission (PGC)
PA Dept. of Forests & Water
Dept. of Env. Resources – Bureau of Forests (BOF)
Dept. of Conservation & Natural Resources (DCNR)
U.S. Forest Service
Cameron County Soil & Water Conservation District
Northcentral PA Reg. Planning & Development Comm.
PA Economic Development District
Clinton County Farm Bureau
PA Farm Bureau
PennDot

Universities

Pennsylvania State University
Frostburg State University
Purdue University
Indiana Univ. of Pennsylvania

Elected Officials

State Legislators
Clinton County Commissioners
Game & Fish Commission of the Pennsylvania House of Representatives
Pennsylvania General Assembly

Additional Individuals or Groups of Individuals

Property Owners
Residents
Farmers
Hunters

Special Interest Groups

PA Federation of Sportsmen's Clubs
PA Chap. of the Nat. Wild Turkey Fed. (NWTF)
Elk County Federation of Sportsmen Club
Western Clinton County Sportsmen's Association
Elk Hunt Advisory Committee
Rocky Mountain Elk Foundation (RMEF)
PA Wildlife Habitat Unlimited (PAWHU)
Lehigh Valley Chapter of the Safari Club International
Northcentral PA Conservancy

Citizen Groups

Benezette Homeowners Group
Citizens Against the Exploitation of Private Prop. Rights
Clinton County Elk Support Group
Sproul Forest Chapter of RMEF

Internal & External Planners and Developers

Northcentral PA Economic Development Corporation
Clinton County Economic Partnership
State Park Planners
Town and County Planners
Forest Planners
Tourism Industry Representatives

Corporations

P & N Coal Company
Consolidated Natural Gas Corporation (CNG)

The PGC appears to have been facing the conundrum of balancing the greater good and will of society with individuals' rights. An expanding elk herd would lead to elk hunts and increased elk viewing tourism, both of which seem to be in the general public's best interest. On the other hand, a larger herd needs more space, a space like that in northcentral Pennsylvania, one with few residents and farmers. The decision was made that the PGC develop and implement an elk trap and transfer project intended to expand the existing elk range and at the same time provided more tourism opportunities. A direct consequence of initiating this strategy was the generation of local dissonance between those supporting the elk project and those opposed to it. The most vocal detractors of the PGC, and most adamantly opposed to the elk relocation project were local landowners and farmers who contended that the PGC was impinging on their individual rights by transferring the elk near their properties. Some of these disenfranchised stakeholders also contended that they were being routinely excluded from access to the media, and constrained from publicly sharing their viewpoints. Finally, there is evidence that suggests that the PGC's implementation of this elk project may have negatively impacted its *position* in the public's mind.

While there may not have been a way to avoid this "public" conflict, its intensity and the negative publicity associated with it, may have been minimized had Seeking's (1980) warning that, "...all major policy proposals should be thoroughly ventilated in public [deliberately subjected to public scrutiny and debate] before becoming officially adopted as policy" (in Murphy, 1985, p. 173) been observed. This type of a proactive approach to tourism development affords stakeholders with divergent values constructive opportunities to explore differences in a collaborative process rather than simply fighting over differences in the media (Eyre & Jamal, 1998). Initial planning stages should have been designed to openly address the concerns of those who now see themselves as having been *marginalized* by the process. Although extremely difficult to quantify, it seems only logical that the PGC's position in some people's minds has worsened and that it may now need to allocate significant additional time and energy to *reposition* itself in the public arena as direct result of implementing its Elk Trap and Transfer Project the way it did.

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IMPACTS OF WILDLIFE VIEWING AT DIXVILLE NOTCH WILDLIFE VIEWING AREA

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Abstract: Dixville Notch Wildlife Viewing Area provided an opportunity to examine the motivations, knowledge level and attitudes of wildlife viewers as well as the response of wildlife to observation and other human caused stimuli at a designated wildlife viewing site. Using integrated social science and biological information allowed recommendations to be made for managing wildlife viewing sites where moose (*Alces alces*) were the focus.

Introduction

The purpose of this study was to use multiple disciplines to integrate sociological and biological data related to wildlife viewing, wildlife viewers, and viewed wildlife to determine impacts and develop management recommendations for wildlife viewing areas. The study specifically examined wildlife viewing impacts on moose, the motivation of wildlife viewers, their attitudes about forest and wildlife management practices, and their knowledge levels about related management activities. Stimuli-response interactions between human activity at a wildlife viewing site and moose behavior were also examined. Due to space limitations in the proceedings, this article focuses on an overview about the wildlife viewers and on the conclusions and recommendations for inclusion in a wildlife viewing management plan. Additional information is available from the author and will also appear in forthcoming publications.

Nonconsumptive recreational activities have grown in popularity relative to traditional wildlife and fish recreational pursuits over the past 35 years (More, 1979; Duffus & Deardon, 1990; Mangun et al., 1992; Flather & Cordell, 1995). Wildlife viewing activities grew steadily from the mid-1970s through the early-1990s, with an average annual rate of increase that exceeded all other wildlife-oriented recreation. In the early 1990s, a memorandum of agreement amongst state and federal agencies addressed the increased activity in wildlife-related

recreation with the development of wildlife viewing programs (Vickerman, 1991). A wildlife viewing program integrates education and wildlife viewing components (Duda & Young, 1994). Watchable wildlife programs are based on the assumption that if we fail to provide a sufficient amount of high quality habitat, our children and grandchildren will not have the current opportunities to enjoy wildlife (Hudson et al., 1992).

Historically, environmental impacts of nonconsumptive recreation were considered benign, however, the notion that such recreation has no environmental impact is no longer tenable (Flather & Cordell, 1995). Recreationists often degrade the land, water, and wildlife resources that support their activities by simplifying plant communities, increasing animal mortality, displacing and disturbing wildlife, and distributing refuse (Boyle & Samson, 1985).

Research in the area of human impacts on wildlife has been relatively sparse and fragmented (Larson, 1995). Wildlife viewers and photographers actively seek and approach wildlife, unlike other recreationists who mostly encounter wildlife accidentally. Thus, these activities are potentially more disturbing to wildlife as encounters are more frequent and of longer duration (Boyle & Samson, 1985). In order to minimize potential conflict between recreational use and wildlife management goals there is a need to: 1) understand the responses of wildlife to recreational activities, 2) understand the factors that influence the nature and magnitude of impacts, 3) improve research methods, and 4) develop and implement new management strategies (Cole and Knight 1990). An assessment of potential wildlife impacts should consider types of visitors to an area, their recreational activities, their interaction with wildlife and wildlife habitat, and the behavioral and physiological response of wildlife (Pomerantz et al., 1988).

To date, most studies that have used a human dimensions approach to examine human wildlife interactions have focused on recreational activities such as hunting and fishing. There are basic gaps in our knowledge about wildlife viewers and factors that influence people to participate in this activity. For example, what are people's motivations for taking wildlife viewing trips, what is the relationship between knowledge of wildlife and unintended impacts to wildlife, and to what extent do interactions with wildlife influence knowledge of wildlife (Vaske et al., 1995).

Not only has scant attention been paid as to why wildlife viewers choose such recreation, few have attempted to integrate findings across ecological and social science research (Kuss et al., 1990s; Decker et al., 1992). This lack of integration of the available empirical evidence has limited the application of research data to visitor impact management. Natural resource planners must contend with both ecological and social issues. At issue is how can wildlife viewers achieve maximum overall satisfaction and have minimal impact on the wildlife they are viewing. Research needs to be applied to both development of viewing programs and to mitigation strategies for recreational impacts (Larson, 1995).

In New Hampshire, the Fish and Game Department developed a concept proposal for a watchable wildlife program in 1991. The proposal outlined a statewide program that included a wildlife viewing guide, a variety of viewing sites with varied levels of facilities development, and public programs (Silverberg, 1992). Arguably, wildlife watching was extremely popular already and important by any measure. For example, moose (*Alces alces*) were a primary tourist attraction in the northern part of the state, as evidenced by entrepreneurial moose viewing tours and town promoted moose festivals.

Research Objectives

The overall objective of this study was to integrate sociological and biological data collected about wildlife viewing, wildlife viewers, and viewed wildlife to assess potential impacts and develop recommendations for management of wildlife viewing areas as part of a wildlife viewing management plan. Specific objectives were:

- 1) to compare whether moose changed their rate and time of visitation at the salt lick after construction of the wildlife viewing site,
- 2) to survey wildlife viewers to determine their demographics, knowledge level, motivation for wildlife viewing, and attitudes toward specific wildlife viewing management techniques,
- 3) to determine whether there was a predictable response by moose to viewing behavior and other human-caused stimuli,
- 4) to utilize information from this research to develop optimal management protocols for wildlife viewing sites.

Study Area

The New Hampshire Fish and Game Department, in partnership with the New Hampshire Scenic and Cultural Byway program, built a wildlife viewing area on Route 26 in Dixville Notch during the fall of 1996. A number of factors led to this choice as a wildlife viewing site, the primary being the presence of a salt lick caused by runoff of road salt that attracted numerous visible moose; moose exhibit natural craving toward sodium (Schwartz & Renecker, 1997). A second factor was the proximity of clear cuts with abundant forage (Peterson, 1955).

A six-car parking lot, trail, and viewing blind were built in December 1996. A trail approximately 125 m in length led to a viewing blind that held up to twenty people. The viewing blind had slits which faced the main lick and a moose trail that entered the lick from the east. A kiosk at the parking lot had information about wildlife viewing ethics, services in the area, and nearby designated viewing sites. Nine educational signs were located along the trail and covered topics about wildlife management, wildlife found in the area, suggestions for successful wildlife viewing, and viewing etiquette.

Biological Study to Determine Impacts of Wildlife Viewing on Moose Use of Roadside Licks

Two segments of this research focused on determining the biological impacts on moose using the roadside licks where wildlife viewing took place. The findings are summarized here. The first segment of the research focused on the rate, use, and time of use of the roadside salt lick. There were no significant changes in the diurnal or nocturnal patterns of moose encounters when comparing data from 1996 prior to construction of the viewing blind with data from 1997-1999. Encounters were most frequent at 2200-2400h and 0400-0600h. There was no annual difference in the time patterns of moose encounters in a 24-hour period at the viewing site versus the control site.

Observers recorded reactions of moose to stimuli associated with people visiting the viewing site during June and July 1997-1999. Typically, multiple moose behaviors and human stimuli were recorded during each observation period. Seven specific human stimuli were categorized: car passing, truck passing, car stopped, car stopped with human outside of vehicle, visitor walking to or from blind, visitor in the blind talking, visitor talking loudly or creating a disturbance.

Moose responses were defined as one of six behaviors: feeding, looking, alert, moving, fleeing, and grooming. A moose was considered feeding if it was actively feeding or licking mud. Looking was defined as when a moose appeared to stare at the stimulus. Alertness was defined as when a moose stopped its previous behavior, stared, and had its ears in a 45 degree position (deVos, 1958). A moose was regarded as moving if it took several steps and resumed its previous behavior. Fleeing meant a moose rapidly moved from the lick to perceived cover. Grooming was defined as licking or moving to repel insects.

All responses and stimuli were noted during each recorded minute. Because moose were not marked, and moose have affinity for specific salt licks, the same moose was probably observed on different days. Multiple observations occurred each observation period. These two facts meant that observations were not independent.

The standard visitor approached the blind quietly, did not talk while in the blind, and usually was in the blind before moose visited the lick. Presumably, moose rarely detected the presence of the standard visitor or, at the very least, showed no reaction to the standard visitor. Baseline moose behavior was recorded only when the standard visitor was present and there were no other human stimuli.

Analysis of single and multiple combinations (2-4) of human stimuli were necessary because multiple stimuli often occurred simultaneously (e.g., car stopped and truck passing). Moose response was quantified by totaling the number of observed responses and calculating the percentage of each response that was exhibited for individual and combinations of stimuli. A Chi-square test ($p \leq 0.05$) of independence (Zar, 1996) was used to

compare the distribution patterns of the various behavioral responses to different stimuli to the pattern of responses associated with the standard visitor.

A total of 48 observation periods occurred; 9 in 1997, 19 in 1998, and 20 in 1999. Observation periods ranged from 5 - 93 minutes; the average period lasted 22 minutes. During an observation period an average of 6.4 cars passed, 1.6 trucks passed, 3.2 cars stopped and 0.9 humans were out of their car. During the 342 minutes of observation when the standard visitor was present, moose spent 34% of time feeding, 20% of time looking, and approximately 25% of time alert. They moved within the lick almost 15% of the time. Little grooming behavior (<2%) was witnessed and moose fled without apparent reason <4% of the time).

Differences in behavioral response patterns when compared to the standard visitor response pattern were found when a truck passed ($X^2=26.5$, df 5, $p=0.000$) and a car stopped ($X^2=18.8$, df 5, $p=0.002$). The behavior that most dramatically changed with these stimuli was that the moose fled from the lick.

Wildlife Viewers Characteristics, Motivations and Attitudes

Survey data were collected in two phases. Initially, a five-minute site interview was conducted in the parking lot prior to a viewer visiting the educational signs and viewing platform. Subsequently, a survey was mailed to a subset of interviewees to further assess additional demographic information, knowledge level and attitudes, motivations for stopping, and satisfaction with the experience using the Dillman method (1978). Data were compiled and analyzed with SPSS. The level of significance for all tests was $p=0.05$. Each interviewee was assigned an identification number that was used to track their interview and survey results. Descriptive statistics were derived for each variable including frequency, %, mean, and median.

Demographics

A total of 431 interviews were conducted with 222 completed in 1997 and 209 in 1998. In 1997, 97% of the interviewees agreed to complete the mail survey, while in 1998 only 66% agreed. A total of 335 surveys were mailed, 202 in 1997 and 133 in 1998. Analysis was conducted on 209 completed surveys. It is acknowledged that the mail survey group was self-selected as they agreed to be surveyed after their site interview.

About half (55%) of the viewers surveyed were non-residents of New Hampshire, 42% lived in the nine other counties of New Hampshire with 5% from local Coos County, and 3% were visiting the United States. Almost half (48%) came to the site as couples, and a third (33%) were with families. A third of the viewers were on a day trip; the rest lodged somewhere in New Hampshire with 19% at the BALSAMS.

The interview sample was 57% female, while the mail survey was completed almost equally by males (48%) and females (52%). Viewers were overwhelmingly white (97%). Nearly half (49%) of the respondents were college graduates, 25% had attended some college, trade or business school, 23% graduated from high school, and 3% did not finish high school. The income level varied from 2% with an income of <\$10,000, to 11% with an income >\$100,000. A similar proportion fell into the \$20,000-39,000 (26%), and the \$40,000-\$59,999 range (27%). Viewers varied in age with 10% between 18-29, 16% were 30-39, 31% were 40-49, 26% were 50-59, 14% were 60-69, and 3% were > 70 years (Table 3). The average age was 44.6 years. The majority (57%) did not belong to any conservation organization; 23% held membership in one organizations, 11% were members of two, and 9% belonged to three or more conservation organizations.

Two-thirds of the viewers did not see a moose that day; however, the majority (81%) saw birds and about half (51%) saw small mammals. They spent 0- ≥ 21 days viewing wildlife in the past year. Viewers had visited different types of wildlife viewing areas including sites along roads (69%), remote sites (45%), sites with informational signs (29%), and developed sites with parking lots and trails (27%).

Knowledge

Eight knowledge-based questions were asked, including several questions worded similarly to those in the site interview. Answers to these questions were found in the educational signs located at the viewing site. Each wildlife viewer was assigned a percent correct for the pre- and post-tests. Chi square analysis was conducted to determine if there were differences in how the respondents scored on their pre- and post-tests. Analysis of variance was used to determine if there were differences in knowledge based upon age, income, and level of education. All statistical tests performed were at a significance level of $p=0.05$.

Less than 10% of the interviewees considered themselves knowledgeable about moose, with 28% believing they had limited knowledge. However nearly a quarter scored 100% on the pretest, over half scored $\geq 75\%$, and only 13% scored $\leq 50\%$. Neither education level ($F=1.115$, df 4, $p=0.330$) or income ($F=1.111$, df 6, $p=0.357$) was related to pre-test scores. The mean score of male (67.4 ± 1.9 (mean \pm std. dev.)) and female viewers (64.6 ± 1.6) was not different ($F=1.197$, df 1, $p=0.274$). On the mail survey all viewers answered at least one question correctly. Over 70% of viewers scored >75%; <5% scored <50%. Sixty-five percent of the viewers increased their score on the post-test, and 33% scored lower; post test scores were higher ($78.7\% \pm 1.1$) than pre-test scores ($66\% \pm 1.3$) ($X^2=124.88$, df=42, $p=0.000$). Scores also increased on the three questions that appeared on both the interview and the survey: why moose were attracted to muddy areas ($X^2=41.6$, df 1, $p=0.000$), what adult moose eat ($X^2=10.4$, df 1, $p=0.000$), and the best time to view wildlife

($X^2=137.5$, $df 1$, $p=0.000$). Scores on the post test were not influenced by level of education ($F=0.487$, $df 4$, $p=0.745$), age ($F=1.154$, $df 5$, $p=0.154$), or gender ($F=1.051$, $df 1$, $p=0.306$). Scores of those earning $> \$80,000$ were lower ($F=4.482$, $df 6$, $p=0.000$) than those of other income levels.

Attitudes Toward Wildlife Management Techniques

Specific attitudes toward wildlife management techniques at wildlife viewing areas were explored. A Likert five-point scale was used, with 1 as totally unacceptable and 5 as totally acceptable. Frequency distributions, mean, and median were derived for each technique. Responses of viewers to proposed wildlife management techniques are presented in Table 1.

Motivations of Dixville Notch Wildlife Viewers- Wildlife viewing is a leisure activity and as such viewers

motivations were measured using a standard list of fourteen questions drawn from Driver's (1983) recreational experience preferences and adapted for wildlife viewing. A five-point Likert scale was used with 1 being not important and 5 being extremely important. The majority (76%) of viewers were actively looking for wildlife, and 84.5% of these were specifically looking for moose. An overwhelming majority (86%) had seen at least one moose in the wild, and 23% saw a moose previously that day. The primary reasons for stopping were because they saw the sign (27%), they were looking for moose (24%), they were curious (14%), they were told (8%), or they had combinations of other reasons (27%). The mail survey examined people's motivations for stopping (Table 2). Four groupings of motivations were identified by factor analysis using principal component analysis with varimax rotation and were labeled general, creative, experiential, and opportunist (Table 3).

Table 1. Response of Viewers at the Dixville Notch Wildlife Viewing Area to Proposed Management Activities, 1997-1998

	No. Of Viewers	Mean	Percent of Responses				
			Totally Unacceptable	Unacceptable	Neutral	Acceptable	Totally Acceptable
Educational information present	208	4.38	.5	1.9	13.5	26.9	57.2
Arrest people for harassing wildlife	209	4.38	6.7	4.3	3.8	13.9	71.3
No hunting zones	207	4.35	7.2	4.3	6.8	9.2	72.5
Some habitat off limits	208	4.31	5.3	2.3	9.1	14.4	66.3
Close sites if impacted	207	4.15	6.8	7.7	7.2	19.8	58.5
Distances people allowed should be controlled	209	4.03	5.3	7.2	13.9	25.8	47.8
Forest should be kept in this stage to ensure moose	207	3.74	7.7	9.7	23.2	18.8	40.6
Naturalist on site	208	3.35	7.2	8.7	41.8	26	16.3
All sites should be as developed as this one	206	3.25	10.7	13.6	37.4	16.5	21.8
No. of people should be limited	208	3.00	18.8	13.9	32.3	18.3	16.8
Salt should be placed in the lick	209	2.09	45.5	19.1	23.4	4.8	7.2
Wildlife that injures people should be killed	206	1.97	49	17.5	23.8	6.8	2.9
Allowed to get as close to moose as they want	209	1.44	73.2	16.7	5.7	1.4	2.9
Wildlife should be held captive	209	1.12	92.8	4.3	1.4	1.0	.5

Table 2. Rank Order, Mean Score of Motivations and Percent of Viewers Identifying a Motivation as Moderately or Strongly Important for Stopping at the Dixville Notch Wildlife Viewing Area 1997-1998

Motivations	Number of Respondents	Mean	% of Moderate to Strongly Important
To experience new and different things	207	4.02	73.4
To see what was there	209	3.99	68.4
To learn or study about nature	207	3.84	65.2
To do something with my family	203	3.59	51.9
To experience a quiet time in the north woods	208	3.45	47.7
To get away from the usual demands of home and office	205	3.37	54.7
To develop my wildlife viewing skills and abilities	204	3.17	43.3
To experience excitement	204	3.13	42.7
To get exercise	204	2.65	29.9
To be with my friends	195	2.49	27.7
To share my outdoor knowledge with others	197	2.27	20.8
To have a personal spiritual experience	198	2.27	21.2
To do something creative, such as sketch, paint or take photographs	198	2.18	9.3
Because someone told me it was a good place to stop	189	2.17	20.6

Table 3. Preferred Experiences Based on Factor Analysis Using Principal Component Analysis with Varimax Rotation of Motivations of Visitors to the Dixville Notch Wildlife Viewing Area 1997-1998

	Eigenvalue	% Var.	Factor 1	Factor 2	Factor 3	Factor 4
Motivation Factor 1-General	5.078	36.3				
Experience a quiet time			0.80632	0.14460	0.18473	-0.14099
Get away from the usual demands			0.79168	0.13129	0.03789	0.35180
Do something with family			0.72590	0.00809	0.03789	0.35180
To get exercise			0.59724	0.33054	0.20441	0.13231
To be with friends			0.55727	0.31701	-0.08522	0.37550
Motivation Factor 2-Creative	1.314	11.5				
To do something creative			0.06076	0.81847	0.09986	-0.02857
Share outdoor knowledge			0.15384	0.73543	-0.07727	0.31880
Personal spiritual experience			0.23258	0.64456	0.16356	0.21181
To develop wildlife viewing skills			0.26957	0.53343	0.49815	0.15407
Motivation Factor 3-Experiential	1.624	9.4				
To see what was there			-0.10422	-0.09537	0.77579	0.14535
To experience new and different things			0.28811	0.18381	0.73920	-0.07210
Learn about nature			0.4.568	0.02272	0.65978	0.02483
Motivation Factor 4-Opportunist	0.925	6.6				
Someone told me it was a good place to stop			0.02636	0.26516	0.02651	0.78785
To experience excitement			0.38906	0.09090	0.37506	0.55099

Satisfaction Levels of Dixville Notch Wildlife Viewers

The majority of viewers (74%) indicated that they thoroughly enjoyed their visit to Dixville Notch; 65% wanted to return, and 71% felt that travel was a worthwhile expense. Five questions, with a five point Likert scale from strongly disagree (1) to strongly agree (5), were used to examine the viewer's overall satisfaction with their wildlife viewing experience at Dixville Notch (Ditton et al., 1981). The five statements were scaled to form an overall satisfaction level of the viewers' experience at the Dixville Notch Wildlife Viewing Area. The majority (71%) were satisfied or highly satisfied with their experience,

22% were dissatisfied or highly dissatisfied, and 7% were neutral.

Daily temperature, cloud and blackfly conditions were recorded by the interviewers. Using simple linear regression, there was no relationship between satisfaction level and ambient temperature ($R^2 = 0.000$, Beta 0.0829, Significance 0.2371), cloud condition ($R^2 = 0.0090$, Beta-0.0949, Significance 0.2371), and blackfly condition ($R^2 = 0.0023$ Beta 0.0476 Significance 0.4908). The majority (68%) felt that seeing a moose would be the highlight of their day, while 10 % felt that seeing either a moose, bear, or deer would be their highlight. In actuality only 33% of

the viewers saw ≥ 1 moose at the site. There was no relationship found between having a satisfactory experience and seeing a moose ($F=0.203$, $df 6$, $p=0.976$).

Twenty-six variables including motivation factors, age, income, education and recreational activities were used to build a stepwise regression model using backward then forward procedures to identify the variables which explain the most variation in satisfaction. The appropriate multiple regression model for the examined data includes three independent variables: Motivation Factor 1, Motivation Factor 3 and Motivation Factor 4. It was found that those viewers influenced by Motivation Factor 1 were more likely to be satisfied with the experience at Dixville Notch Wildlife Viewing Area, ($\beta=0.429$, $\text{significance}=0.000$) while viewers influenced by Motivation Factor 4 were also likely to be satisfied ($\beta=0.184$, $\text{significance}=0.000$). Those influenced by Motivation Factor 3 had a negative influence on satisfaction ($\beta = -0.195$, $\text{significance} = 0.000$). The R square indicates that about 26% of the variance is explained by the 3 predictor variables. Motivation Factor 1 had the most influence on satisfaction and explained the greatest variance (18.8%), while Motivation Factor 3 explained 3.7% of the variance and Motivation Factor 4 explained 3.4%.

Summary of Findings

1. The visitation rate of moose at the Dixville Notch salt lick did not change after the construction of the wildlife viewing area.
2. There was no significant change in the time of day moose visited the Dixville Notch salt lick after construction of the wildlife viewing area.
3. Moose predominantly used Dixville salt licks nocturnally with the highest diurnal visitation occurring at 0400-0800h.
4. Travel patterns immediately adjacent to the viewing blind changed after construction of the site.
5. Quiet viewers in the blind had minimal effect on moose behavior.
7. Moose were generally tolerant of human-caused stimuli exhibiting the greatest percentage of behavioral changes when cars stopped and trucks passed.
8. Wildlife viewers to Dixville Notch were predominately families and couples visiting northern New Hampshire.
9. The majority of Dixville Notch wildlife viewers did not belong to a conservation organization.
10. Viewers expected wildlife viewing sites to include educational opportunities.
10. Knowledge levels of viewers increased after their visit presumably because of educational signs.
11. Education and income level were not related to viewer knowledge of moose.
13. Viewers were amenable to regulations.
14. Viewers were less accepting of wildlife management techniques that created artificial situations.

15. There was a slight discrepancy between viewers' understanding of moose habitat requirements and acceptance of forestry management for habitat enhancement for moose.
16. Dixville Notch viewers were motivated by a variety of factors categorized as general, creative, experiential, and occasional.
17. Satisfaction regarding the viewing experience in Dixville Notch was not related to viewing moose but was related to the general, experiential, and occasional motivation factors.

Conclusion

The Dixville Notch Wildlife Viewing Area presented viewing opportunities for individuals, couples and families. Most of the viewers were visitors to the region and spent purposeful time looking for moose and other wildlife. Motivations of viewers fell into four groupings, general, experiential, creative and opportunist. Although the majority did not see moose at the site, most had a satisfactory experience.

Marketing Programs Based on Demographics

Viewers participated in a number of recreational activities that provided opportunities to view wildlife. Certainly, the impacts of moose viewing on tourism and business opportunities in the area needs further exploration. Marketing programs to attract wildlife viewers to the area should be based upon the area offering new and different experiences in a relaxed environment with opportunities to learn about nature. Programs should be designed to reach a middle-aged, family oriented, gender equal audience with higher than average income. Marketing efforts should be focused both in and out of state. Marketing efforts can also be based on the motivational preferences such as emphasizing wildlife viewing as a way to enjoy a quiet time, get away and do something with family and friends.

Education and Conservation

A desire to learn and study about nature was an important motivation dimension. Wildlife viewers expected interpretive information to be available and felt that education was completely acceptable as a management tool. This study indicated that knowledge can be increased while visiting a site through the presentation of information on signs. Since knowledge plays a role in influencing attitudes, it is essential to provide education at sites. For example, while wildlife managers often rely on habitat site enhancements, some wildlife viewers don't understand the reasons behind such activities. Educational materials should explain how and why site enhancement activities occur and what are the projected results. Interpretive techniques should be tailored for different types of sites and situations. Since wildlife conservation is a goal of viewing programs, it is worthwhile to explore how viewers not involved with conservation organizations could be involved in conservation activities at viewing sites.

Wildlife Viewing Management

In considering management of wildlife viewing sites in a region there is a need for a variety of sites as evident by a third of the viewers felt that not all sites should be as developed at Dixville. Based on the types of sites visited by viewers in other locations, the mix of sites should include roadside, remote sites, and those accessible by foot travel. Motivation preferences should also be taken into account when designing a site. The four experience preferences found in this study can serve as a framework for developing specific wildlife viewing opportunities. The experience based management approach can be useful in meeting the recreational aspects of wildlife viewing. However because the goals of viewing programs extends beyond just a recreation activity, it will be helpful to use the characteristics of the four motivation factors to design activities and sites. Through designing opportunities that fulfill the outcomes of these desires, wildlife viewers will generally have a satisfactory experience.

There are a number of wildlife and recreational management activities wildlife viewers readily accept and can be used at wildlife viewing sites including providing educational opportunities, rules and regulations to minimize impacts and site selected habitat enhancements. An important component in developing a wildlife viewing management program or site is understanding potential impacts on the species being viewed. Studies such as this one, provide a better understanding of impacts of viewers on a wildlife resource.

In summary, the primary reason that resource management agencies developed wildlife viewing programs was to promote wildlife conservation. One of the greatest benefits of developing wildlife viewing sites is that they provide a place to provide educational materials, demonstrate wildlife management techniques and ultimately help viewers develop a sense of stewardship toward wildlife and other natural resource. The biological studies and survey of wildlife viewers at Dixville Notch provides a list of elements important to wildlife viewers for inclusion into a wildlife viewing management plan.

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**Methodology in
Outdoor Recreation
Research II:
Instruments & Models**

EFFECTS OF PRETESTING WITH THE ADVENTURE RECREATION MODEL INSTRUMENT

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Abstract: The Adventure Recreation Model, first proposed and tested by Ewert and Hollenhorst (1989), attempts to describe participant characteristics and patterns of use in adventure recreation activities. The Adventure Recreation Model is based on the relationship of level of engagement in an outdoor recreation activity (ranging from beginner, to development, to commitment) with the variables of personal attributes of the participant (i.e., frequency of participation, skill/experience level, decision-making locus of control, and motivation factors) and activity/setting attributes (i.e., level of risk, social orientation, and environmental orientation). Because the Adventure Recreation Model is based on a developmental approach (i.e., movement from beginner to commitment), it would be desirable to use the Adventure Recreation Model instrument to measure changes in groups of participants before and after outdoor experiences. However, the instrument needs to be tested to determine the effects of exposure to the pretest. The purpose of this study was to determine if exposure to the Adventure Recreation Model instrument as a pretest had an effect on posttest scores on the instrument. Results showed that, overall, the instrument did not appear to have a pretest effect, with the exception of four out of 30 of the variables measured.

Introduction

The Adventure Recreation Model, first proposed and tested by Ewert and Hollenhorst (1989), attempts to describe participant characteristics and patterns of use in adventure recreation activities. According to Ewert (1989), the adventure model is based on the notion that the "seeking of risk and uncertainty of outcome" (p. 8) differentiate adventure recreation pursuits (e.g., rock climbing and backpacking) from other forms of outdoor recreation (e.g., hunting and fishing). The Adventure Recreation Model is based on the relationship of level of engagement in an outdoor recreation activity (ranging from beginner, to development, to commitment) with the variables of personal attributes of the participant (i.e., frequency of participation, skill/experience level, decision-making locus of control, and motivation factors) and activity/setting

attributes (i.e., level of risk, social orientation, and environmental orientation). Because the Adventure Recreation Model is based on a developmental approach (i.e., movement from beginner to commitment), it would be desirable to use the Adventure Recreation Model instrument to measure changes in groups of participants before and after outdoor experiences. However, the instrument needs to be tested to determine the effects of exposure to the pretest. The purpose of this study was to determine if exposure to the Adventure Recreation Model instrument as a pretest had an effect on posttest scores on the instrument.

Overview of the Adventure Recreation Model

According to Ewert and Hollenhorst (1989), the Adventure Recreation Model is based on the personal attributes of the participant, such as frequency of participation, skill/experience level, decision-making locus of control, and motivation factors, and on the activity/setting attributes, such as level of risk, social orientation, and environmental orientation. The model is reconstructed in Figure 1 to show how the participant and activity/setting attributes relate to each other. As can be seen in the model, participants are divided into categories of Introduction, Development, or Commitment based on their level of engagement in outdoor adventure. The Adventure Model suggests that as engagement level increases:

- skill level increases
- frequency of participation increases
- locus of control becomes more individualized
- preferred risk level increases
- preferences for natural conditions increase
- social context moves to solitary or expert-only groupings
- motivations of challenge, achievement, and risk taking increase or prevail.

The model allows for classification of participants based on their experience level. This classification, in turn, is related to the level that users experience, perceive, or desire in other elements of the outdoor adventure experience. The model, in theory, could help managers more closely target and/or manage programs and resources that are suitable for the participant. On a more theoretical level, the model could help researchers understand adventure recreation behavior.

Testing the Adventure Recreation Model

Attempts to more fully understand adventure recreation behavior have been a consistent theme in the research literature in the recreation field. Although Ewert and Hollenhorst first published the Adventure Recreation Model in 1989, earlier research had led to its development. In an earlier study, Ewert (1985) examined the relationship between participant motivations for mountaineering and their level of experience. He found that type of motivation (intrinsic or extrinsic) differed for participants, depending on their self-reported level of experience in the activity. More experienced participants tended to have more

intrinsic motivations and inexperienced participants more extrinsic motivations for mountaineering. The results of this study led to the development of a more complex model, in which type of motivation was one variable among several others associated with adventure recreation. This model, the Adventure Recreation Model, was presented by Ewert (1989), and tested by Ewert and Hollenhorst (1989). According to Ewert (1989), the adventure model was based on the notion that the "seeking of risk and uncertainty of outcome" (p. 8) differentiates adventure recreation pursuits (e.g., rock climbing and

backpacking) from other forms of outdoor recreation (e.g., hunting and fishing). Further, Ewert and Hollenhorst (1989) contended that models addressing recreation or outdoor recreation participation inadequately explained or even addressed the *risk-seeking* dimensions adventure experience and adventure activities (p. 127). Their 1989 study found support for the proposed adventure recreation model (Figure 1). The model was effective in identifying components of the outdoor adventure experience that were highly correlated to level of engagement in the adventure activity (described in more detail below).

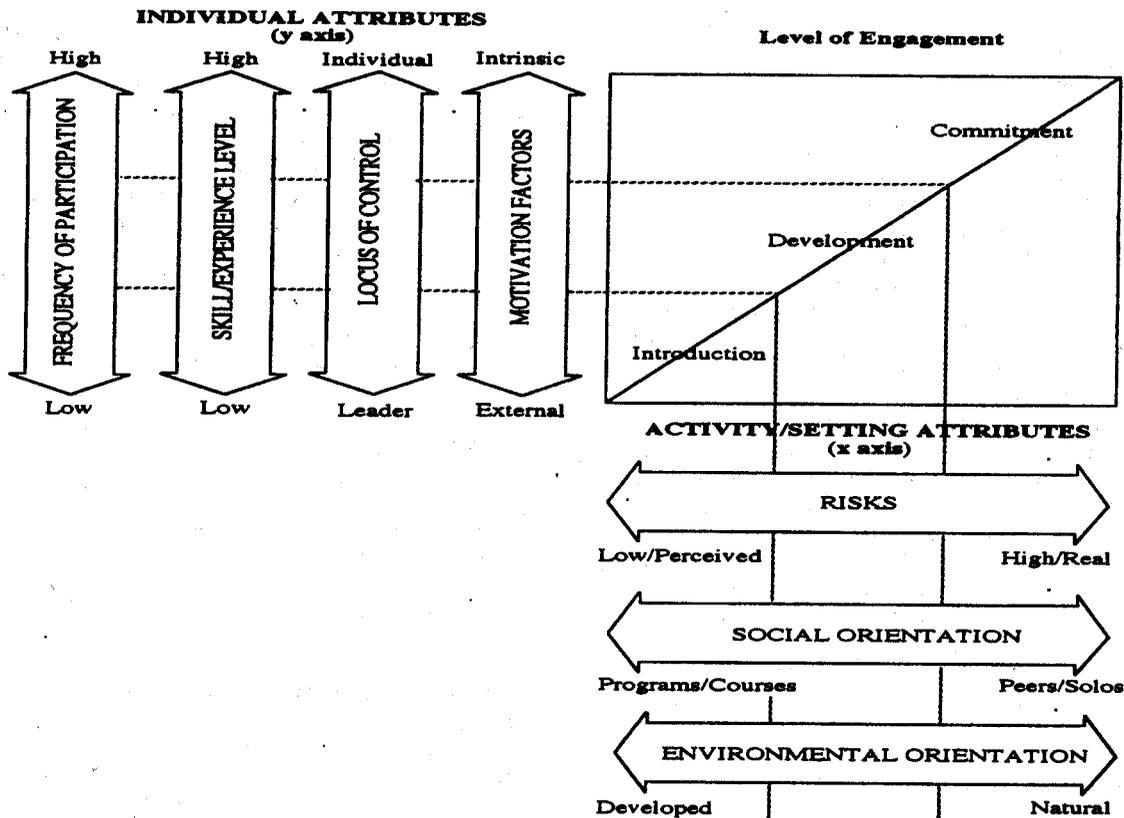


Figure 1. The Adventure Recreation Model by Ewert & Hollenhorst (1989)

Though strong support for the model was found, continued testing of its validity was suggested. Subsequent assessments have generally, but not identically supported the model. Schuett (1992) tested a revised adventure model, using slightly different variables, and reported support for that model. Priest (1992) proposed and tested an alternative model, "The Adventure Experience Paradigm," (p. 128), based on the concepts of risk and competence. His findings also provided support for the concepts in Ewert and Hollenhorst's (1989) original model. The most thorough follow-up study was done by Anderson, Anderson, and Young (2000). Using Ewert and Hollenhorst's model and instrument, the original study was

replicated with a group of subjects who were more diverse in their motivations to participate in outdoor adventure and in their professed levels of engagement. Like the original study, more recent study found relationships between engagement level and all user attributes and between level of engagement and the setting attributes of risk level and type of environment. Unlike the original study, Anderson, Anderson, and Young found nine, not two motivations for participation to correlate with level of engagement.

Through continuing replication efforts, the building of a viable adventure model may be achieved. There are several benefits of having a viable adventure model. First, it would

provide a clarified conceptual understanding of adventure recreation. Second, the model could help resource managers to understand and justify the need to provide a diversity of recreation and adventure recreation opportunity settings. Third, a sound adventure model could guide adventure programmers in tailoring their programs' settings, social contexts, and risk levels to participants' level of engagement in the activities. According to Priest (1992), resource managers and other outdoor recreation service providers could provide a spectrum of recreation opportunities, which would accommodate varying levels of skill and ability. Being able to match users to the settings and programs that best meet their needs would assist managers in providing higher quality experiences and environments. Fourth, as the model undergoes validation and refinement, a new possibility emerges—using the instrument to measure changes or differences in participants over time or stemming from programmatic interventions. Adventure educators might use the Adventure Recreation Model instrument in various quasi-experimental designs to determine the effects of their programs. Because such uses of the instrument will often involve repeated testing of participants, it is important to determine whether the simple exposure to the instrument as a “pretest” affects posttest responses. Hence determining if there are “testing effects” is the purpose of the present study.

Methods

The purpose of this study was to determine if exposure to the Adventure Recreation Model instrument as a pretest had any effects on posttest scores on the instrument. The null hypothesis stated that there would be no significant difference between those students who completed both the pre- and posttest and those who completed the posttest only on the Adventure Recreation Model instrument.

Subjects for this study were 129 undergraduate recreation majors from two separate, but similar summer session Outdoor Education Practicum courses. The subjects ranged in age from 19 to 42 with an average age of 22.5. Fifty-six percent were females, 44% males.

For this study, the required course taken by these subjects was simply a context and not treatment variable. Still, a few words about that context might be helpful. The thirteen-day course included seven days in a camp-like resident outdoor education setting, with amenities, dining facilities, and a structured program. The course also included a six-day wilderness canoe trip in New York State's Adirondack Park.

This study employed the true experimental posttest only control group design (Gay, 1992). In each summer session, half the students were randomly chosen to complete the Adventure Recreation Model instrument at the beginning of the outdoor education practicum. All students completed the posttest administration of the instrument. As depicted in Figure 2, the “treatment” in this experiment was completing the Adventure Recreation Model Instrument as a pretest.

Figure 2. Posttest-only Control Group Design

R	X	O
R		O

R = Random Assignment
 X = Adventure Recreation Model Instrument before course
 O = Adventure Recreation Model Instrument taken post course

The instrument includes items to measure the variables of level of engagement, user attributes (skill level, locus of decision-making), setting attributes (type of environment, preferred level of risk, social orientation), and 18 motivations for participation. The questionnaire used a nine point Likert scale, to which subjects responded for each item on the questionnaire. These items are presented in Table 1.

The data were analyzed with SPSS 9.0. The two groups, those who were pre- and posttested, and those who were posttested only, were compared on each variable using independent t-tests for interval data and Chi Square for nominal data. A .10 level of significance was chosen because in this type of study, Type II (beta) errors are more worrisome. The conventional .05 level might prompt the claim of no pretest effects when, in fact, there are such effects.

Results

As can be seen in Table 2, there were no significant differences between the experimental and control group in relation to age, gender, and their frequency of participation in outdoor adventure experiences. Given the lack of difference between the experimental and control groups, it can be assumed that extraneous variables were controlled for by randomization, and that if there are any differences on the dependent variable, they would be due to the pretesting, or experimental condition.

As can be seen in Table 3, the results showed that for 26 variables measured on the Adventure Recreation Model questionnaire, there were no significant differences found between the group that was pretested and the group that was not. Four variables, level of engagement, skill level, participation with friends, and skill development motivator, were significant at the .1 level (but not at the .05 level). The pretested group had a slightly higher mean score (5.8) on level of engagement than the nonpretested group (5.2). The pretested group also had a higher score on skill level (5.5) than the nonpretested group (5.0). The nonpretested group had a slightly higher score on the social orientation/friends variable (7.5) than the pretested group (6.9). On the motivation variable to develop skills, the pretested group scored higher (7.2) than the nonpretested group (6.7).

Table 1. Items on the Adventure Recreation Model Instrument (Ewert & Hollenhorst, 1989)

1. As an outdoor adventurer, I would consider myself to have had....(little or no experience a great deal of experience)
2. As an outdoor adventurer, I would consider myself to be a(n) ... (beginner with little or no skill expert, highly skilled)
3. How many adventure experiences have you had in the last two years? (none ... more than 10)
4. Regarding most of your outdoor adventure experiences, decisions are usually made by... (others myself)
5. Regarding your recent outdoor adventure experiences, the level of risk you preferred in the activity was ... (low ... high)
6. Regarding your recent adventure experiences, most of the risks in these experiences have been primarily... (social ... physical)
7. Regarding your recent outdoor adventure experiences, the environment in which they occurred was ... (man-made ... natural)

Regarding most of your adventure experiences, with whom do you participate?

1. Friends
2. Programs/Classes
3. By myself
4. Peers of similar skill/experience
5. Teachers/mentors

Regarding your adventure experiences, how important are the following reasons for participating?

- | | |
|---|--------------------------------------|
| 1. to develop skills | 11. to enhance my feelings of myself |
| 2. to make friends | 12. because of requests by others |
| 3. for my image in society | 13. to socialize |
| 4. to do something new/different | 14. to take risks |
| 5. for physical fitness | 15. for excitement and stimulation |
| 6. for the personal challenge | 16. to experience a sense of control |
| 7. for the competition (with others or environment) | 17. for feelings of achievement |
| 8. to experience nature | 18. for status among my peers |
| 9. for fun and enjoyment | 19. to express my creativity |
| 10. for my career/job | |

Table 2. Comparison of Characteristics of the Experimental (Pretest/Posttest) Group with the Control (Posttest Only) Group

Variable	Test Used	Descriptive Statistics	Statistic	Significance
Age	Independent t-test	<u>Pretest/Posttest Group:</u> Mean = 22.9; SD = 4.9 <u>Posttest Only Group:</u> Mean = 21.9; SD = 4.1	t = 1.233	p = .22
Gender	Chi-Square	<u>Pretest/Posttest Group:</u> Female = 39; Male = 34 <u>Posttest Only Group:</u> Female = 35; Male = 23	$\chi^2 = .630$	p = .43
Frequency of participation	Chi-Square	<u>Pretest/Posttest Group:</u> No trips = 1 1-2 trips = 15 3-6 trips = 25 7-10 trips = 10 More than 10 trips = 9 <u>Posttest Only Group:</u> No trips = 1 1-2 trips = 14 3-6 trips = 20 7-10 trips = 9 More than 10 trips = 11	$\chi^2 = .626$	p = .96

Table 3. Comparisons of the Experimental (Pretest/Posttest) Group with the Control (Posttest-Only) Group on Each Variable in the Adventure Recreation Model Instrument

Variable	<i>Pretest/Posttest Group</i>		<i>Posttest Only Group</i>		<i>t</i> value	Significance (* .1 level)
	Mean	SD	Mean	SD		
<u>User Attributes:</u>						
Level of engagement	5.8	1.8	5.2	2.0	1.790	.076*
Skill level	5.5	1.6	5.0	1.8	1.679	.096*
Locus of decision-making	5.5	1.4	5.4	1.8	.664	.508
<u>Setting Attributes:</u>						
Level of risk	6.1	1.5	5.9	1.8	.928	.355
Type of risk	5.5	1.6	5.5	1.3	.155	.877
Type of environment	7.1	1.7	6.7	1.6	1.468	.145
Social orientation – friends	6.9	1.7	7.5	1.9	-1.872	.064*
Social orientation – classes	5.4	1.9	5.0	2.1	1.254	.212
Social orientation – self	3.8	2.3	3.6	2.3	.382	.703
Social orientation – peers	6.1	1.8	5.6	1.9	1.576	.117
Social orientation – teachers	4.4	2.0	4.0	2.3	1.064	.289
<u>Motivations for Participation:</u>						
To develop skills	7.2	1.5	6.7	1.6	1.808	.073*
To make friends	6.6	1.9	6.7	1.6	-.386	.700
For the image	3.2	2.0	3.1	2.1	.073	.942
For novelty	7.5	1.1	7.3	1.6	.924	.357
For physical fitness	7.0	1.6	7.1	1.5	-.347	.729
For the challenge	7.7	1.3	7.8	1.3	-.296	.768
For the competition	4.9	2.2	5.2	2.5	-.877	.382
To experience nature	7.4	1.4	7.2	1.8	.647	.519
For fun and enjoyment	8.1	1.1	8.4	.9	-1.570	.119
For career/job	6.0	2.3	6.3	2.0	-.864	.389
For feelings of self-esteem	6.6	1.9	6.8	1.9	-.642	.522
Requested by others	4.0	1.9	3.6	2.1	1.210	.228
To socialize	5.9	2.0	5.8	1.8	.476	.635
To take risks	6.4	1.8	6.1	1.8	.939	.349
For the excitement	7.5	1.3	7.1	1.6	1.266	.208
To experience control	5.8	1.8	5.4	2.1	1.058	.292
For a sense of achievement	7.4	1.3	7.3	1.5	.365	.716
For status	3.2	1.8	3.3	2.0	-.140	.889
To express creativity	6.2	2.0	5.8	2.1	1.055	.293

Discussion and Recommendations

This study found that exposure to the pretest did not appear to influence resultant scores on the posttest with the exception of the four variables identified above. For these four out of 30 variables, there is a greater probability for pretest effects. Three of these four variables were related to skill level or skill development. Subjects who take the pretest may be made more aware of their skill level as a result of the questions on the pretest.

Based on these findings, it is recommended that the Adventure Recreation Model instrument be used to measure changes in participants using pretesting. By using the instrument in this manner, more rigorous testing of the Adventure Model can occur, due to its developmental approach. However, further study of pretesting effects is in order, particularly with the variables that assess skill. The pretest may cause a sensitization of skill assessment on the part of subjects. In the meantime, using the instrument in pretest/posttest studies may proceed, but with caution in interpreting at least these four items in the instrument.

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MODELING NONLINEAR PREFERENCES

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Abstract: Economic theory, as well as intuition, supports the notion of increasing or decreasing marginal rates of substitution. That is, the marginal benefit derived from an increase in a desired good or service, or one's willingness to accept tradeoffs among various costs or benefits, depends on the current mix or allocation. However, due to widespread availability and ease of use, linear models are frequently used to model preference structure for environmental goods or services. This paper presents an approach for estimating nonlinear effects and contrasts the results with those of linear models. The effects on the optimal choice in multiattribute decisions and acceptability of tradeoffs among costs and benefits are highlighted.

Introduction

Economic theory, as well as intuition, supports the notion that preferences for most types of goods or benefits are nonlinear. The value placed on obtaining an additional unit of a good or achieving the next level of an objective usually depends on the current level. That is, the marginal benefit derived from an increase in a desired good or service, or one's willingness to accept tradeoffs among various costs or benefits, depends on the current mix or allocation. However, due to widespread availability and ease of use, linear models are frequently used to model preference structure for environmental goods or services. This paper presents an approach for estimating nonlinear effects by examining the relative values that private landowners place on various attributes of forest management.

Privately owned forests comprise nearly three-quarters of the forest land in the United States and are expected to play an important role in meeting future needs for timber, recreation, wildlife habitats, and many other forest-related benefits (USDA Forest Service, 1988; 1995). There is concern that these lands may not meet their potential in achieving objectives related to overall ecosystem health and sustainability, nor in providing benefits that transcend legal and political boundaries, e.g., biodiversity, water quality, and habitat for certain kinds of wildlife.

Surveys of private forest-land owners conducted by the USDA Forest Service show that many owners hold their woodland primarily for noncommercial reasons (Birch, 1996). Many people own forest land because it is part of the farm or residence, for aesthetic enjoyment, to view wildlife, or participate in other forms of forest-related recreation. Landowner attitudes and motivations suggest that they are favorably disposed to providing nontimber benefits and protecting the health of the forest ecosystem. However, the large number of owners, diversity of objectives, increasing fragmentation, and nonmarket nature of many benefits pose problems in estimating what can be expected from these lands and in designing policy to

influence behavior (Dennis et al., 2000). We need to better understand the relative importance that landowners attach to various objectives as well as their willingness to incur costs associated with achieving these benefits. This information is relevant for policy formation and as an input to larger analytical models.

Conjoint techniques were used to solicit landowner preferences for management involving varying levels of timber harvesting, recreational trail improvement, apple tree maintenance to benefit wildlife, protection of a rare species of fern, and cost. The nonlinear nature of the relationships among the variables is explicitly explored. An ordered probit model is used to estimate preferences. The results are used to compute marginal rates of substitution (MRS), that is, the tradeoffs that landowners are willing to make to achieve changes in the levels of other objectives.

Methods

The Dillman (1978) Total Design Method was used to design a survey that was mailed to 1,250 forest-land owners who hold at least 10 acres of forest land in Franklin County, Massachusetts. In addition to answering questions on his or her attitudes toward land management and demographics, each respondent completed a conjoint survey. The useable response rate was 61.3 percent.

Conjoint analysis is a technique for measuring psychological judgments and is frequently used in marketing research to measure consumer preferences (Green et al., 1988). Respondents make choices between alternative products or scenarios that display varying levels of selected attributes. The utility of each attribute can be inferred from the respondent's overall evaluations. These partial utilities indicate the relative importance of each attribute's contribution to overall preference or utility. They can be combined to estimate relative preferences for any combination of attribute levels. Conjoint techniques are well suited for soliciting and analyzing preferences in environmental decisions that frequently entail tradeoffs between costs and benefits that are not represented efficiently in market transactions.

Forest-land owners in Franklin County were asked to rate four alternative management scenarios for a hypothetical forested property shown in a figure within the survey. The figure included an area of apple trees, a section of rare ferns, and a recreational trail that passed through the sample property. Each alternative was rated on a scale of 1 to 10, with 10 representing alternatives that they definitely would undertake and 1 those that they definitely would not undertake. Ratings of 2 to 9 represent how likely they would be to undertake alternatives about which they were unsure. Each alternative varied by one or more of the following five attributes: the proportion of the apple trees to maintain on the hypothetical property, the proportion of rare ferns to protect, the extent of the trail network to improve, the extent of timber harvesting, and cost. An orthogonal array was used to create a succinct subset of attribute combinations that allows estimation over the entire range of attribute values ($3^5 = 243$ possible combinations). The resulting 18 alternatives were assigned

to questionnaires in equal frequency. Each alternative consisted of a unique bundle that included all five individual attributes. Each attribute had one of the three possible levels appearing in parentheses. Alternatives appeared as follows:

- Maintain (none/half/all) of the apple trees shown on the figure that benefit wildlife.
- Protect (none/half/all) of the acres containing a rare species of fern shown on the figure by not harvesting timber in this area or otherwise disturbing the ferns.
- Improve (none/half/all) of the trail network shown on the figure. Improvements, if any, would include the cost of building a footbridge over the stream and clearing scenic vistas.
- Harvest timber from (none/half/all) of the lands shown on the figure. Any harvest would be selective, designed to remove poorly formed and leave some high-quality trees; 25 to 30 percent of all trees would be removed.
- This option would have a net cost to you of \$ (50/250/500).

A secondary objective of the survey was to examine landowner attitudes about collaborative management. Landowners were partitioned into two groups. Each group received an identical questionnaire except one group that was asked to imagine that they owned a portion of the hypothetical property described earlier and to rate their willingness to cooperate with adjoining landowners to achieve the management objectives depicted by the alternatives. Because the objective here is to illustrate the conjoint technique and a procedure for estimating nonlinear effects on preferences and not collaboration, responses for both groups are pooled for estimation.

A random utility model was used to explain forest-land owner preferences. When presented with a set of alternatives, individuals are assumed to make choices that maximize their utility or satisfaction. The utility that the *i*th individual derives from the *j*th alternative (U_{ij}) can be represented as:

$$U_{ij} = X'_{ij}\beta + e_{ij}$$

where X_{ij} is a vector of variables, which may include transformations of variables, that represent values for each of the five attributes of the *j*th alternative to the *i*th individual; β is a vector of unknown parameters; and e_{ij} is a random disturbance, which may reflect unobserved attributes of the alternatives, random choice behavior, or measurement error. In the empirical study under consideration, a respondent's utility level (U_{ij}) for each alternative is not observed, but a rating (r_j) is observed that is assumed to proxy for his or her underlying utility.

Following McKenzie (1990, 1993) and others, the analytical capabilities of the conjoint rating model can be illustrated by assuming that rating (r_j) can be modeled as a linear combination of the variables representing the attribute levels. Typically, only linear effects are

considered but we modify the analyses to include quadratic effects to test for nonlinear relationships:

$$r_j = a + b_1x_{1j} + b_2x_{2j} + \dots + b_nx_{nj} + q_1x_{1j}^2 + q_2x_{2j}^2 + \dots + q_nx_{nj}^2$$

The estimated partial utilities are the combined linear (b_n 's) and quadratic (q_n 's) effects of a discrete change in the level of the associated attribute on overall preference. Relative overall preference for any alternative (combination of attribute levels) can be determined by summing across Equation 2.

The MRS is the rate at which an individual is willing to trade one good for another while remaining equally well off (Nicholson, 1978). The MRS or acceptable tradeoff of one attribute for another is determined by the ratio of the marginal responses. Setting the total differential of (2) to the point of indifference and solving yields the marginal rates of substitution or the acceptable tradeoffs for the respective attributes:

$$dr_j = b_1dx_{1j} + b_2dx_{2j} + \dots + b_n dx_{nj} + 2q_1x_{1j}dx_{1j} + 2q_2x_{2j}dx_{2j} + \dots + 2q_nx_{nj}dx_{nj} = 0$$

$$dx_{1j} / dx_{2j} = - (b_2 + 2q_2x_{2j}) / (b_1 + 2q_1x_{1j})$$

Results

Seventy-eight percent of Franklin County is forested, most of which is in nonindustrial private ownership. The average respondent owned 60 acres of forest land, and 70 percent of the parcels were fewer than 100 acres. Nearly 80 percent of the respondents lived within 5 miles of their woodland, 60 percent had owned their land more than 15 years, and one-third had a management plan. Approximately half of the owners were 55 or older, and 74 percent had completed at least 1 year of college.

The model was estimated using a polychotomous probit technique developed by McKelvey and Zavoina (1975) to analyze ordinal level dependent variables. The dependent variable (r_j) is the rating for each alternative scenario and was coded from 0 to 9. The explanatory variables (attributes) were coded 0.0, 0.5, and 1.0 to account for the proportions of apple trees to maintain, trail improvements, fern protection, and extent of timber harvesting. Cost was coded in units of \$100 (0.5, 2.5, and 5.0). Each respondent rated four alternatives for a total of 2,504 rated scenarios. The results are shown in Table 1.

The estimated signs and relative magnitudes of the coefficients provide information on the respondents' preferences. As expected, increased levels for each of the attributes except cost had a positive effect on ratings. The magnitude of the positive effects of maintaining apple trees to benefit wildlife and fern protection were greater than those for trail improvements and extending the area available for timber harvesting (which also can be interpreted as lower restrictions on harvesting). Landowners, therefore, generally placed higher value on wildlife and other nontimber amenities (Birch, 1996; Brunson et al., 1996) and with the attitudinal aspects of this survey (Rickenbach et al., 1998).

**Table 1. Ordered Probit Parameters for a Multiattribute Conjoint Rating Survey
(Dependent Variable = Rating, Coded 0 to 9, N=2,504)**

Variable	Coefficient	Std. error	t-ratio
Constant	-0.1785	0.0701	-2.55
Linear effects:			
Apples	1.1019	0.1955	5.64
Ferns	1.3040	0.1871	6.97
Timber	0.2142	0.0521	4.11
Trails	0.8580	0.1863	4.61
Cost	-0.0415	0.0116	-3.57
Quadratic Effects:			
(Apples) ²	-0.5264	0.1836	-2.87
(Ferns) ²	-0.6996	0.1784	-3.92
(Trails) ²	-0.6570	0.1841	-3.57

All variables were significant at the 1% level.
Log-likelihood = 5179.1

A commonly accepted economic precept with intuitive appeal is that one's preference for more of a particular good depends on how much of the good one already has and that willingness to trade among goods depends on the quantities of each good in one's possession. Quadratic effects were examined to estimate these expected nonlinear relationships. The quadratic terms for apple tree maintenance, fern protection, and trail maintenance were negative and statistically significant, which indicates decreasing marginal benefits for these attributes. The partial utility or the contribution of an individual attribute toward the total utility provided by an alternative is determined by combining both the linear and quadratic effects at a given attribute level. For example, the partial utilities for fern protection at levels none, half, and all are 0.0, 0.477, and 0.604, respectively (computed as $b_i x_i + q_i x_i^2$). Thus the increase in utility resulting from an increase in fern protection from none to half is 0.477, while the increase from half to all is 0.127. It appears that marginal increases in utility decreased once respondents believed that a significant portion of the ferns were protected or the apple trees maintained. Although respondents favored initial trail improvements, similar calculations indicate that maintaining all of the trail network versus just half actually decreased overall utility or preference for an alternative.

To examine the tradeoffs that respondents were willing to accept among the objectives marginal rates of substitution can be computed for any two attributes at the selected

levels using Equation 3. The tradeoff between cost and attaining management objects is frequently useful to policymakers. The MRS between cost and the other attributes shown in Table 2 illustrate the notion of decreasing marginal benefits. Landowners were willing to incur less additional cost to maintain apple trees or protect ferns as the amounts of these attributes already under protection increased. For example, landowners on average were willing to incur a cost of \$23 to protect an additional percentage of the ferns if only 25 percent were currently under protection, but only \$6 if 75 percent already were being protected.

The trade-offs that landowners are willing to accept between two attributes may be determined at any level selected for each attribute by computing the MRS for the attributes directly using Equation 3 or by comparing the MRS between each attribute and cost. For example, if half of the apple trees are currently being maintained, Equation 3 can be used to determine the level at which landowners become indifferent between additional trail improvements and increased apple tree maintenance. The MRS equates to one when apple tree maintenance is at 50 percent and trail improvement is at approximately 21 percent. Thus landowners would prefer to improve the trail network up to the 21-percent level over additional apple tree maintenance at 50 percent. At this level, landowners would be willing to incur the same additional cost to improve an additional 1 percent of the trail network or to maintain an additional 1 percent of the apple trees.

Table 2. Marginal Rates of Substitution, Cost (\$) per 1-percent Increase in Listed Variable at Indicated Initial Level

Level	Apples	Ferns	Trails	Timber
0.00	26.54	31.40	20.66	5.16
0.25	20.20	22.98	12.51	5.16
0.50	13.86	14.56	4.36	5.16
0.75	7.52	6.13	*	5.16
1.00	1.18	*	*	5.16

* Negative

Summary

Nonindustrial, privately owned forests are expected to play an important role in meeting needs for a wide range of forest-related benefits. Estimates of the relative values that landowners place on various nonmarket benefits provided by their land and the costs they are willing to incur to achieve different levels of these benefits are useful to policymakers. Conjoint techniques are well suited for assessing the relative values and acceptable tradeoffs (MRS) among various management objectives. Including quadratic effects allows estimation of nonlinear MRS, which economic theory and these empirical results suggest are important.

Landowners in Franklin County, Massachusetts, generally placed higher values on the ecological aspects (fern protection and apple tree maintenance) of management alternatives than on use-related aspects (timber harvesting and recreational trail improvements). Both fern protection and apple tree maintenance exhibited decreasing marginal rates of substitution. Although landowners feel strongly about providing these benefits, their willingness to make tradeoffs between these and other objectives or to incur additional cost depended greatly on the current levels to which the objectives were being met.

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Personal Relevance, Involvement & Loyalty in Outdoor Recreation

PSYCHOLOGICAL COMMITMENT AS A MEDIATOR OF THE RELATIONSHIP BETWEEN INVOLVEMENT AND LOYALTY

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Abstract: This study tested the ill-understood issues of involvement and loyalty relations. Even though many studies have indicated that loyalty is a function of involvement, only minimal agreement has been reached on the extent to which the constructs of involvement would predict repeat participation. A structural model is developed that relates members' involvement and loyalty using psychological commitment as a mediator. Results suggest that involvement has both a direct and an indirect effect on loyalty and confirm the role of psychological commitment as a mediator between involvement and loyalty.

Introduction

In recent years, leisure scholars have shown increasing references to loyalty and its antecedents in leisure activities or programs (Gahwiler & Havitz, 1998; Iwasaki & Havitz, 1998; Kim, Scott, & Crompton, 1997; Park, 1996). Their studies have emphasized that participants' involvement and psychological commitment are major concepts in the formation of loyalty. Psychological commitment has earned special attention as an essential part of the process of the formation of loyalty (Pritchard, Havitz, & Howard, 1999). Involvement, however, has not yet been empirically linked to loyalty. Even though studies show that involvement and loyalty gauge the success and effectiveness of agencies, only minimal agreement has been reached on how the constructs of involvement and loyalty should be developed and how involvement will predict the strength of repeat participation. Thus, this study will identify the relationship between involvement and loyalty, and test these relations with psychological commitment as a mediator.

Literature Review

Involvement

While scholars have reached consensus that involvement means personal relevance or psychological identification toward an object (McIntyre & Pigram, 1992; Selin & Howard, 1988), there are still various definitions of involvement in the literature. Conceptual definitions of involvement have differed with regard to the content and objects (Costley, 1988).

The content dimension proposes two positions of involvement along an antecedent-consequence continuum. First, the state approach explains involvement as a state of identification or social psychological attachment toward an object. In this sense, involvement is defined as "an unobservable state of motivation, arousal or interest toward a recreational activity or associated product" (Rothschild, 1984, p. 216). According to Selin and Howard (1988), individuals identify themselves by developing psychological attachment towards a recreational activity--'ego' involvement. Similarly, relating the concept of ego and self, the personal relevance of a recreational activity is called 'enduring' involvement. 'Enduring' involvement refers to more permanent attachment while 'ego' involvement implies more situational feelings (Schuett, 1993). Whatever it is called, involvement is explained as a psychological concept from the perspective of being an affective state.

The second approach to describing involvement is a response-based perspective. It takes the consequent position of the involvement continuum. It is generally defined as behavioral involvement, that is the degree of personal relevance an activity holds for an individual and related behavioral consequences (Bloch, Black & Lichtenstein, 1989). It is also measured by response patterns such as frequency of participation, time and money spent, and type of information sources (Kim, Scott & Crompton, 1997).

Approaches to the involvement construct also differ in terms of the objects they attend to (Costley, 1988). In the field of marketing, the direction of brand-specific involvement, advertising involvement, or situational involvement is different in nature. In the field of recreation, the object of involvement can be an activity, service provider, or destination. Generally, leisure involvement refers exclusively to activity involvement. Activity involvement is most frequently studied in the field of recreation and tourism (Havitz & Dimanche, 1997). In some cases, activity involvement is defined as commitment to a specific activity or program (McIntyre & Pigram, 1992). On the other hand, activity involvement refers to the identification of self with an activity or program (Siegenthaler & Lam, 1992). Recently, there are volumes of studies showing that activity involvement is different from commitment but related to it (Kim, Scott & Crompton, 1997; Iwasaki & Havitz, 1998).

With regard to the measurement of involvement, Havitz and Dimanche (1990) proposed several propositions about involvement in the context of recreation and tourism. Among them, the first proposition addresses an important issue of involvement measurement: "Multifaceted scales that portray the involvement construct as a profile of scores, rather than as a single score, are most appropriate for measuring involvement with recreational and tourist experience" (Havitz & Dimanche, 1990, p. 184). Even though single-faceted measurement may be accepted as reliable measurement (Zaichkowsky, 1985; Kim, Scott & Crompton, 1997), it is generally believed that multiple dimensions of measurement contribute to the representation of complex involvement concepts (Havitz & Dimanche, 1997).

As multifaceted measurement better represents involvement concepts, the dimensions of involvement is another issue. Generally, involvement dimensions developed by Laurent and Kapferer (1985) are adopted and modified in leisure and recreation studies. Their study suggested a multidimensional approach with five facets: interest, pleasure, sign, risk importance, and risk probability. While this scale was developed exclusively for consumer goods and services, recreation scholars adjusted it to the concept of recreation and tourism.

Most researchers accept three dimensions of involvement in recreation and leisure (Havitz & Dimanche, 1997). First, perceived importance/interest of activity has been an essential part of involvement (Selin & Howard, 1988; Schuett, 1993; Havitz & Dimanche, 1990, Park, 1996). Every current study includes importance/interest as a facet in the construction of involvement (Havitz & Dimanche, 1997). Enjoyment/pleasure value has been also embraced as a major dimension of involvement in the leisure literature because it reflects a significant element of the leisure concept (Selin & Howard, 1988; Siegenthaler & Lam, 1992; Park, 1996). In addition, sign/self-expression value has been identified as another major component of involvement (Kim, Scott & Crompton, 1997; McIntyre & Pigram, 1992).

Many authors suggest that loyalty and involvement are different constructs and involvement is an antecedent of loyalty (Park, 1996; Siegenthaler & Lam, 1992; Iwasaki & Havitz, 1998). Related to recreational activity, Siegenthaler and Lam (1992) compared loyalty and involvement, suggesting that loyalty is a consistent behavior that involves dedication and consistency, while involvement is self-identification with an activity. Therefore, loyalty focuses more on behavior and attitude while involvement comprises self-image, interest, centrality, and importance. Even though a substantial amount of research suggests that involvement plays an important role in the formation of loyalty, no empirical studies have been conducted to date to explore the linkage between these constructs.

Loyalty

The loyalty construct has earned considerable attention not only in the field of consumer behavior but also in leisure research (Backman & Crompton, 1991; Iwasaki & Havitz, 1998). The development of the construct of loyalty has evolved within the framework of behavioral, attitudinal, and composite concepts in the field of marketing. First, loyalty was defined as an overt behavior or consequences of behavior (Cunningham, 1956). Therefore, it centers on repeat patterns of the same brand over time. Later, the attitudinal component of loyalty earned attention as a better way of understanding the underlying psychological phenomenon behind behavior. Thus, the attitudinal definition of loyalty focuses on customers' preferences and emotional attachment (Day, 1969). Then, the composite conceptualization of loyalty emerged. In this notion, loyalty is viewed as a two-dimensional phenomenon that is a function of psychological attitudes and behavioral

repetition over some period (Jacoby & Kyner, 1973). This concept allows the categorization of the extent of loyalty as high, spurious, latent, and absent (Backman & Crompton, 1991; Dick & Basu, 1994).

Recently, an alternative explanation of loyalty formation has been suggested. Some researchers have argued that the integration of behavioral and attitudinal loyalty does not reflect the sensitive underlying development of the loyalty process (Iwasaki & Havitz, 1998). Therefore, it has been suggested that access to consumers' beliefs, affect, and intention phases in the attitude-behavior development structure would contribute to the development of the construct of loyalty (Oliver, 1999). Consumers develop loyalty following a cognition-affect-intention pattern and become loyal at each attitudinal phase. That is, consumers become loyal in a cognitive phase first and then in an affective manner, followed by an intentional stage and, finally, they express loyalty behaviorally.

The first phase of loyalty is cognition that is developed through available information. This loyalty is based on consumers' belief that the available information indicates one option is preferable to its alternatives. Cognitive consideration includes accessibility, confidence, centrality, and clarity (Dick & Basu, 1994). However, this stage of loyalty is more likely to be another concept of involvement rather than loyalty itself. The next stage is affective loyalty, which is developed in terms of satisfying experiences. In this phase of loyalty, the consumer develops a liking for or a preferential attitude toward the brand. Examples of affective loyalty are emotion, feeling, mood, and primary affect. Yet, there are also difficulties in effectively measuring the affective side of loyalty.

Conative loyalty is developed after the cognitive and affective phases. It implies the behavioral intention to repurchase the brand. This stage of loyalty is defined as "a brand-specific commitment to repurchase" (Oliver, 1999, p. 35). Therefore, a consumer experiencing conative loyalty appears to be deeply committed to participate at first. Generally, loyalty is defined as the behavioral intention to maintain an ongoing relationship (Sheth, Sisodia & Sharman, 2000). Also, Andressen and Lidestad (1998) operationalized loyalty as participants' repurchase intentions and intentions to recommend to others.

Commitment

From a sociological perspective, the concept of commitment is explained as consistent behavior over some period caused by social pressure or side bet (Becker, 1960). Therefore, behavioral consistency and outside influences are important facets of commitment. Extending this view, Johnson (1973) proposed two distinct meanings: personal commitment and behavioral commitment. Personal commitment refers to an individual's dedication to achieve a line of action. Behavioral commitment is a consistent behavior, which consists of social and cost components.

Unlike the sociological definition that emphasizes the social aspect of commitment, the psychological perspective

stresses the role of personal commitment. Commitment is the “emotional or psychological attachment to a brand...[that] is usually considered in purely cognitive terms that measure consumer attitudes of attachment to a brand” (Pritchard, Havitz & Howard, 1999, p. 334). According to Buchanan (1985), commitment is defined as “the pledging or binding of an individual to behavioral acts which result in some degree of affective attachment to the behavior” (p. 402). Therefore, psychological attachment is considered as a key component of commitment.

Many researchers have arrived at an increasingly accepted consensus that commitment and loyalty are different but related concepts (Pritchard, Havitz & Howard, 1999; Kim, Scott & Crompton, 1997). Dick and Basu (1994) indicated that relative attitude is predicted by the strength of psychological antecedents, that is, commitment influences loyalty. Further, models provided by previous studies confirm that commitment serves as a predictor of loyalty and repatronage (Dick & Basu, 1994; Pritchard, Havitz & Howard, 1999).

Related to the role of commitment in loyalty, Jacoby and Kyner (1973) explained that “the notion of commitment provides an essential basis for distinguishing between brand loyalty and other forms of repeat purchasing behavior and holds promise for assessing the relative degrees of brand loyalty” (p. 3). Also, Samuelsen and Sandvik (1997) insisted that loyalty results from commitment for two main reasons: affective reasons and cognitive motives. Affective commitment is an emotional attachment to the brand while calculative commitment refers to perceived risk in performance among alternatives. In conclusion, commitment that focuses on psychological attachment is an antecedent of loyalty that extends the meaning of loyalty over a simple habitual purchase and preference.

As an improvement in the measurement of commitment, Pritchard, Howard, and Havitz (1992) adapted the theory of

psychological commitment (Crosby & Taylor, 1983) as a basis for the operationalization of the Psychological Commitment Instrument (PCI). The primary aspect of the PCI is symbolic consistency that measures overall reluctance to change important associations with service. The second factor of PCI is volition, which is related to components of free choice and control in one’s preference for a service. Positional involvement is the third factor and refers to personal values and self-images perceived in association with a service. Additionally, informational complexity, which deals with ones’ cognitive structure and how consumers manage information about their preference, contributed to the measurement of commitment (Pritchard, Havitz, & Howard, 1999). According to the previous studies, it is evident that psychological commitment plays an essential role in the formation of true loyalty. Therefore, it is suggested that psychological commitment has a direct effect on loyalty. Also, involvement influences the construct of loyalty. However, it is not clear if involvement has a direct or indirect effect on loyalty and how much it will influence the strength of loyalty. Therefore, this paper addresses: 1) the relationship between involvement and loyalty, and 2) whether psychological commitment functions as a mediator between involvement and loyalty. The hypothesized model and its null model of involvement, commitment, and loyalty are shown in Figure 1.

Methods

Study Sample

The subjects for this study are YMCA members who purchased a membership within the last year. A convenience sample of 152 subjects was drawn from the Bellefonte Pennsylvania Family YMCA. The sample consisted of approximately 60% females with an average age of 41 years. More than 70% of the respondents were married and had a college background.

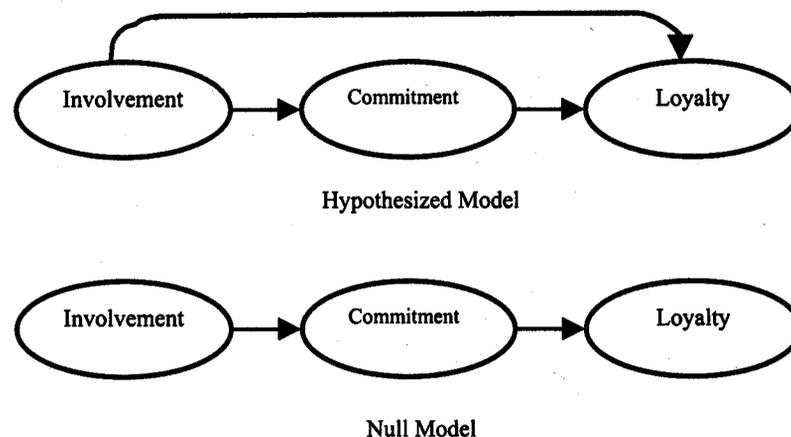


Figure 1. Hypothesized Model and Null Model of Involvement and Commitment and Their Linkage to Loyalty

Instrumentation

Measurement of involvement used a three-dimension involvement scale that is frequently used in the field of recreation and leisure (Havitz & Dimanche, 1997). The dimensions were perceived importance/interest, enjoyment/pleasure, and sign/self-expression value (10 items). Loyalty was measured with the conative loyalty scale. Conative loyalty has been proven by many researchers to be a good indicator of the construct of loyalty (Andressen & Lidestad, 1998; Webster & Sundaram, 1998; Singh & Sirdeshmukh, 2000). Conative loyalty asks about intention of repatronage and advertising by word of mouth (4 items). Psychological commitment was measured with parts of the PCI (Pritchard, Havitz & Howard, 1999). Resistance to change, volitional choice, and informational complexity were the indicators used to measure psychological commitment (5 items).

Results

Prior to testing the structural model in Figure 1, a confirmatory factor analysis (CFA) was conducted to assess the statistical fit of the observed data. Measurement of CFA and the structural equation model were examined with EQS 4.0, a structural equations program. Since every dimension of each factor was specified in advance by theory, CFA can allow for correlation among factors if theoretically justified. CFA produced a chi-square statistic of 253.9 (df=149, $p < .01$), with a comparative fit index (CFI) and non-normed fit index (NNFI) of .93 and .94, respectively. Further, it generated standardized RMR (SRMR) and root mean square error (RMSEA) values of .07, indicating an acceptable level of fit to the data (Figure 2). Although certainly of concern, the overall fit of the measurement model was of secondary importance in the study. The primary concern was to examine the hypothesized causal relations between involvement and loyalty and to test the role of psychological commitment between them.

To test the role of psychological commitment between involvement and loyalty, the hypothesis of the null model was examined: Involvement has a direct and positive effect

on psychological commitment and psychological commitment has a direct and positive effect on loyalty. Estimates for the structural model are contained in Table 1. Results of the paths in the null model suggest that involvement affected psychological commitment. The effects of involvement were positive and significant. Further, psychological commitment influenced loyalty directly and positively. The goodness of fit indices of the null model support the role of psychological commitment as a mediator of the relation between involvement and loyalty.

The examination of the path between involvement and loyalty in the null model suggests an indirect effect of involvement on loyalty. The estimated parameter between involvement and loyalty is .40 (.60 x .67). On the other hand, an estimate of psychological commitment to loyalty is .67. This indicates that the effect of involvement on loyalty is smaller than the effect of psychological commitment on loyalty, confirming the importance of the role of psychological commitment to explain loyalty. But, is it true that psychological commitment has a bigger effect on loyalty compared to involvement?

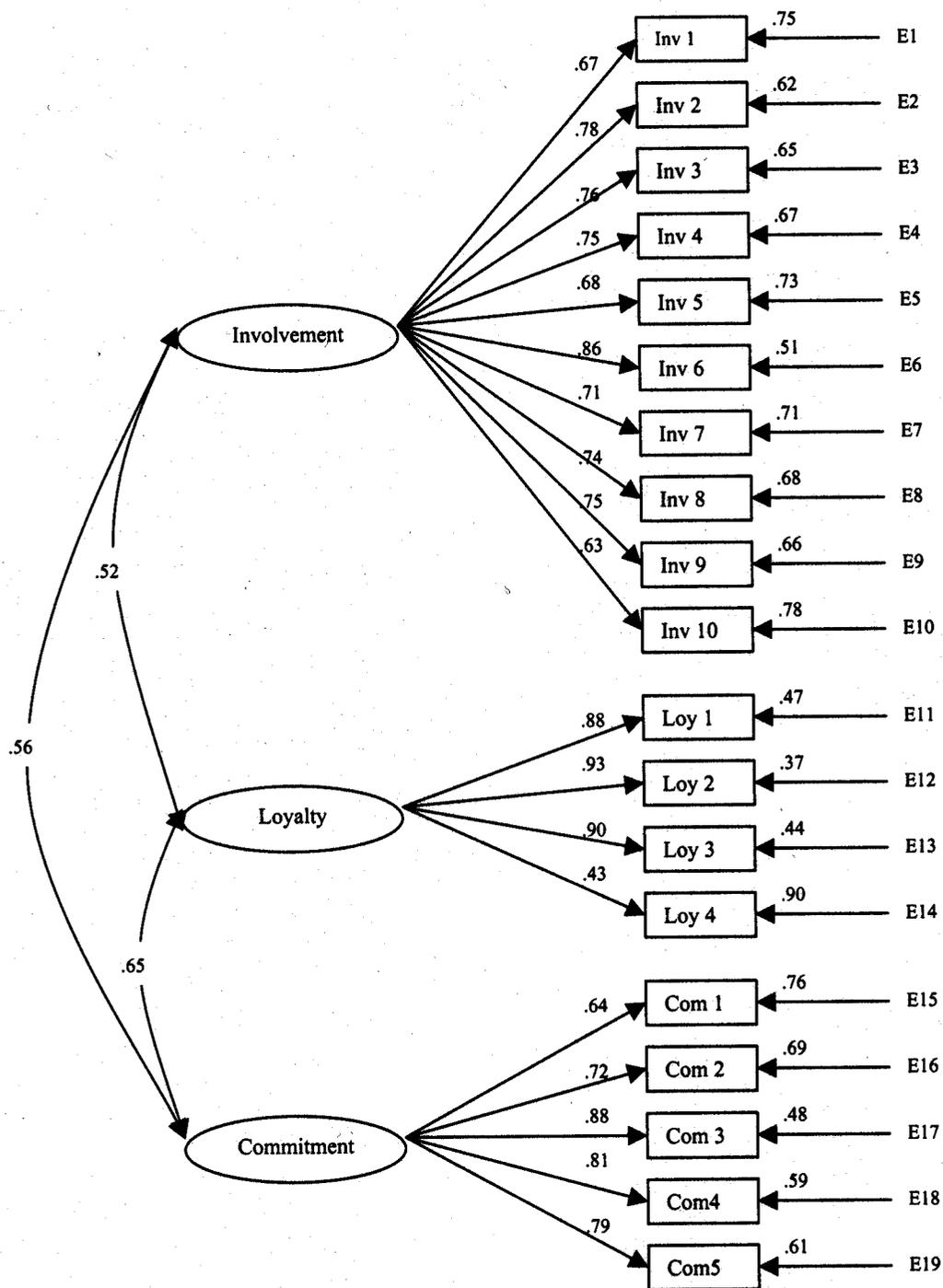
To test the relationship between involvement and loyalty, a direct path was added between them. The hypothesized model met the fitness criteria with an acceptable level (Table 1). Then, the chi-square difference test was employed to determine whether the hypothesized model performed better than the null model (Bagozzi & Yi, 1988). Results showed that the hypothesized model provided a significant improvement over the null model: $\chi^2 = 283.1$ and $\chi^2 = 230.8$ respectively (with 1 degree of freedom difference).

In the hypothesized model, the total effect of psychological commitment is simply the direct effect associated with the path to loyalty (.58). In contrast, the total effects of involvement are defined by the sum of its direct and indirect effects (.58 x .24 + .51 = .65). This total effect is bigger than the total effect of psychological commitment. Therefore, the importance of involvement for explaining loyalty cannot be underestimated.

Table 1. Estimates for the Null Model and Hypothesized Model

Null Model		Hypothesized Model	
Parameter	Estimates	Parameter	Estimates
Involvement → Commitment	.60 *	Involvement → Commitment	.51 *
Commitment → Loyalty	.67 *	Commitment → Loyalty	.58 *
		Involvement → Loyalty	.24 *
Goodness of fit indices			
Chi-square	= 283.1 (df=144)		= 230.8 (df= 143)
Non-normed fit index	= .94		= .94
Comparative fit index	= .95		= .95
Standardized RMR	= .08		= .07
Root mean sq. error of app.	= .07		= .06

* $p > .05$



NOTE: Chi-square = 253.54 (df.149); Bentler-Bonett Nonnormed fit index (NNFI) / Comparative fit index (CFI) = .93 / .94; Standardized RMR (SRMR) / Root Mean SQ. Error of App. (RMSEA) = .07 / .07

Figure 2. Estimates for Measurement Model

Discussion and Conclusion

Several things should be noted concerning the results shown in Table 1. First, results for the two models of mediation show that the effect of psychological commitment is present. Even though some researchers still recognize loyalty and psychological commitment as identical concepts (Park, 1996; Buchanan, 1985; Jacoby & Kyner, 1973), there is increasing consensus that commitment and loyalty are different and psychological commitment is an important antecedent of the structure of loyalty (Pritchard, Havitz, & Howard, 1999; Kim, Scott, & Crompton, 1997). The findings of this study confirm the existence of a mediator between involvement and loyalty, and show the important role of psychological commitment in this relationship. Therefore, managers may strengthen loyalty by maximizing the strategies that emphasize the dimensions of psychological commitment. For example, using diverse information sources such as the Internet and newspapers can increase the consumers' information search dimension.

Second, the importance of involvement to loyalty should be recognized. The model developed in this study suggests the strong influence of involvement on loyalty. The model suggested two significant paths between involvement and loyalty: a direct effect and an indirect effect through a mediator. Even though the direct effect of involvement on loyalty was smaller than the direct influence of commitment on loyalty, the total effects of the constructs suggest that involvement is an equally important predictor of loyalty. Even though many studies have implied that involvement predicts loyalty, no empirical linkage has been revealed to explore the path between them. The findings of this study emphasize the importance of involvement to explain the strength of loyalty, as the model supported a strong linkage between them. Therefore, it is important for managers to focus on providing interesting and enjoyable programs to members, which may lead to increased patronage by the members.

Several suggestions may be made to improve further studies. The primary limitation of this study is its generalizability. Even though members of the YMCA were well suited to examine the theoretical linkage among the concepts, the small size of the sample from only one YMCA may be questioned. Additional research is required that allows for improved generalizability. Also, the construct of loyalty is debatable. Several studies have recognized the deficiency of the operationalization of loyalty and the effort to reveal the concrete conceptualization of loyalty is still an undergoing process. Even though the intentional aspect of loyalty is well established as a dependable definition, more investigation of the loyalty construct is needed.

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Gender Issues in Outdoor Recreation & Resource Management

OLDER CHINESE WOMEN IMMIGRANTS AND THEIR LEISURE EXPERIENCES: BEFORE AND AFTER EMIGRATION TO THE UNITED STATES

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Abstract: The concept of leisure has generally focused on men. This is especially true in Chinese society where women seldom have the right to speak about leisure or mention leisure activities. For many Chinese women, the integration of household and leisure has been necessary to find meaning in life. Based on this concept, we explored older Chinese women immigrants' leisure experiences before and after their emigration to the United States and barriers that they faced in the United States. The researchers used an in-depth interview approach to discover how 9 older Chinese women immigrants interpreted their leisure. Following the in-depth interviews six themes emerged: 1. women's leisure experiences (e.g., watching TV, walking, shopping, exercising, attending church and gardening) after emigration; 2. barriers (e.g., language, transportation and cultural differences) the women experienced in the United States; 3. traditional Chinese values and their effect on the women; 4. religious activities as an important social link; 5. free time or leisure not a problem, and 6. satisfaction with life and positive attitudes toward the future. The findings are useful because more and more Chinese people are emigrating to the United States, and the number of Chinese older immigrants is increasing. In addition, the results give insight into barriers Chinese women face. This information will allow recreation, tourism and resource managers and researchers to think about how they need to market and manage their resources for this ethnic group. As for the marketing aspect, managers and planners may create promotional pieces in Chinese and hold activities for the women in parks and other recreational areas. In terms of management, they should recognize the women's unique language and cultural barriers and recruit bilingual and bicultural professionals to understand the women's needs for adequate leisure activities or programs.

Introduction

"It seems to be a unique rule that when men have established themselves as rulers, they proceed at once to make laws and evolve doctrines to limit the freedom and power of women" (Tseng, 1992, p. 74). In traditional Chinese society, marriage is the final fate for a Chinese woman. She not only marries, but also dedicates her life to her spouse's family. She has to undertake all the daily

chores and responsibilities, such as serving her parents-in-law, taking care of her spouse, raising or nurturing their children and doing all the household chores. To her, it is her duty, her life.

Today, unlike traditional Chinese society, Chinese women are more conscious of their own being and desire to be treated equally (Tseng, 1992). Constraints, however, still exist in that even if a woman works outside the home, she still must assume responsibility for the household duties with little time to think about herself and even less time for leisure.

In 1965, the passage of the Immigration and Nationality Act equalized immigration opportunities to the United States for Chinese people, especially for Chinese women (Cafferty et al., 1983). Before 1965, because of the immigration and naturalization restrictions for Chinese people, most Chinese immigrants were men. After the passage of the Immigration and Nationality Act, the number of Chinese women and Chinese older immigrants increased gradually. Immigration to the United States has had an effect on Chinese culture. Kim, Kim, and Hurh (1991) indicated a movement away from the traditional Chinese value that older Chinese immigrants are to be taken care of by and to live with their children. Gutierrez (1992) found that the failure of service planners and providers to offer culturally relevant services may be based on assumptions that family members or their own communities act as caregivers to Chinese older adults; however, few studies support this notion.

In the past 10 years, there have been numerous studies about leisure and older adults in the United States; however, little leisure research has been completed on America's ethnic minorities, especially on older immigrants. Barriers to social interaction and interpersonal communication experienced by many older Chinese people accelerate their depression and psychosomatic illness. Older Chinese women immigrants with problems such as language barriers, cultural differences, loneliness, helplessness and economic disadvantage may encounter more diseases, psychological problems or a lack of a social network than native older adults. Many older Chinese immigrants cannot read, speak, or write in English and cannot drive, isolating them from and causing a lack of integration into American culture (Kauh, 1999; Tsai & Lopez, 1997).

Furthermore, the U.S. Census Bureau reported the number of foreign-born Chinese immigrants was 1,107,000 in 1997, and predicted that more and more Chinese people will emigrate to the United States. Goldstone (1997) estimated that, in the next decade, the conflicts between the Beijing regime and Hong Kong or Taiwan could raise attempted emigration from China, also increasing the number of Chinese people in the United States. Leisure researchers, however, have not studied Chinese people's leisure experiences in the United States, especially concerning those of older Chinese women immigrants and barriers affecting their leisure experiences creating a need to explore this topic.

Constraints on Women's Leisure

In the past 10 years, there has been a tremendous growth in research on women's leisure. Much of this research is focused on the relationship between gender and leisure. Shaw (1985) examined three approaches to the analysis of women's leisure and discussed ways to integrate the ideas and concepts from these different approaches. The first and dominant approach was to understand how women's leisure is constrained. "Evidence of gender inequality in many areas of social life leads to the expectation that inequality is likely to exist in leisure as well" (Shaw, 1985, p. 9). The strongest argument here is that women are so oppressed that it is impossible for them to have a fulfilling leisure experience. Other common constraints to women's leisure include temporal constraints, economic constraints and lack of opportunities or facilities (Jackson, 1988). The ethic of care is also connected to women's roles as the first caregiver in the family and helps to explain how family responsibility restrains women's leisure.

The "leisure as constraining" was the second approach focusing on how participation in certain kinds of activities influences women's lives and positions within society. Samdhal (1992) held this view and suggested that leisure is not a gender-neutral aspect of social life. The narrow range and stereotypical nature of the social activities considered appropriate for women constrain women's leisure participation. Leisure may constrain women by reducing options and opportunities for non-traditional activities.

The third approach Shaw (1985) used to analyze constraints on women's leisure examined ways in which women's leisure has the potential for resistance from societally imposed constraints. The ideas of agency and leisure as freely chosen or as self-determined are two important theoretical notions that support the argument for resistance. The idea of agency notes that women (and men) are social actors who interpret social situations and actively construct their responses (Mead, 1934). This argument is also based on a conceptualization of leisure while penetrating notions of personal choice, control, and self-determination. Through these notions, traditional views are challenged and women may regain or create a sense of themselves, even effecting gender equality (Shaw, 1994).

The three different approaches are compatible, based on three guiding principles to formulate a framework – 1. recognition of the contradictory aspects of leisure in women's leisure; 2. the different ways in which constraining factors are associated with women's leisure and, 3. the different ways in which resistance can be associated with women's leisure (Shaw, 1994). Then, this broader framework incorporated by these ideas recognizes the diversity of women's lives and experiences and emphasizes the need to understand women's leisure in the context of their everyday experiences as mediated by social structures.

Immigrants Studies

In recent years, the analysis of leisure behavior among specific ethnic populations has received widespread

attention. The increasing older immigrant population places great demands on federal, state and local government agencies to respond with policies and programs that are sensitive to the needs of culturally diverse older immigrant populations (Allison & Smith, 1990).

Allison and Geiger (1993) interviewed 25 older Chinese-American individuals about the types of activities they engaged in, the nature of those activities and the reasons for continued participation in those leisure activities. They found that the types of leisure activities the older Chinese-American immigrants engaged in (e.g. walking, gardening, watching television and reading) did not appear very different from other older cohort groups. Further analyses revealed that these same activities were traditionally characterized by Chinese culture.

Tirone and Shaw (1997) asked 10 women from India about their understanding and appreciation of the North American concept of leisure and to ascertain what life concepts were not central to them. The qualitative approach reflects the meaning, significance, value and role of leisure in the lives of people who are marginalized by ethnic identity or by cultural heritage (Hughes, Seidman, & Williams, 1993). Tirone and Shaw's study illustrated the centrality of family and the lack of private time, which is often associated with reducing opportunity for leisure. Leisure was not viewed as something important or desirable for these immigrant women. The results indicated that for some immigrants, cultural traditions from the person's country of origin continue to effect the person's life. One cannot assume that the Western view of leisure will be viewed positively by people of diverse ethnic backgrounds who have different life experiences.

In traditional Chinese culture, a woman's status is confined by gender roles. One Chinese maxim states that "a woman before marriage must identify her fate with that of her father, after marriage with that of her husband, and after the death of her husband with that of her son" (Tseng, 1992, p. 78). Today, the norms are not so stringent, but women's roles are still limited to family.

Most older women (and men) live with their adult children because "filial piety is the very important Chinese social value that promotes caring relationships between children and parents" (Tsai & Lopez, 1997, p. 80). Since most young couples must work, the household and child care naturally become the work of the older adults, especially older women. Taking care of grandchildren and doing daily chores are not viewed as 'work', but rather a type of leisure. Church is another important aspect of older immigrants' lives because it acts as a socialization outlet (Pogrebin & Poole, 1990). Some active older women participate in religious activities to help others. During these activities, they make their own decisions and achieve a sense of satisfaction.

More and more Chinese people, including Chinese older adults, emigrated to the United States because of the passage of the Magnuson Act of 1943 that removed many

immigration and naturalization restrictions for Chinese people (Cheng & Cheng, 1984). However, problems such as language barriers, cultural differences, loneliness and economic disadvantage limited their activities. They must rebuild their social network, a difficult task for them, because American's form of life was a new experience. The purpose of this study, therefore, was to ascertain the leisure experiences of older Chinese women immigrants before and after immigration to the United States and to discover barriers they encountered in their leisure pursuits.

Method

Symbolic interactionism emphasizes human interaction as mediated by the use of symbols, by interpretation, or by ascertaining the meaning of one another's actions (Mead, 1934). The main idea in Mead's analysis is that the human being has a self and can be the object of his or her own actions (Blumer, 1995). The presupposition is that "human society is made up of individuals who have selves (that is, make indications to themselves); that individual action is a construction and not a release, being built up by the individual through noting and interpreting features of the situations in which he acts; that group or collective action consists of the aligning of individual actions, brought about by the individual's interpretation or taking into account each other's actions" (Blumer, 1995, p. 209). Symbolic interactionists believe that human actions are constructed by themselves through interpreting situations or others' actions instead of reacting to others' actions. From this basis human beings interpret the world they belong to by themselves. To understand life experiences, researchers need to know how people interpret situations and construct actions while interacting with others.

The researchers used the phenomenological approach, focusing on "what people experience and how they interpret the world (in which case one can use interviews without actually experiencing the phenomenon oneself)" (Patton, 1990, p. 70). The phenomenological approach seeks to reflect the meaning, value, role and experience of leisure in the lives of people who are isolated by ethnic identity and by cultural heritage (Hughes, Seidman, & Williams, 1993).

Participants were selected from a Chinese church and a Chinese association. One researcher visited the church and the association and asked for volunteers. A total of 9 women agreed to participate in this study. Immigration status for the women included three permanent residents and six naturalized citizens. Their ages ranged from 60 to 76 years old. All women had been married and two of them were widowed. The length of stay for all women in the United States ranged from 2 to 40 years. Two women lived in the United States less than 5 years, two women between 6 to 10 years, three between 11 to 20 years and two more than 30 years. Five women came after their adult children emigrated to the United States, two women came with their adult children and two came to the United States as students. Four women were living with their husbands, sons, daughters-in-law and grandchildren and three were living close to or in the same community as their adult children. One woman had no children and was living with

her husband. Four women could not speak any English and three women could speak only a little English. Two women who had been in the United States for more than 30 years speak fluent English.

The researchers used a small-scale qualitative research method under the symbolic interactionist theoretical framework. One researcher, fluent in Chinese and English, conducted the interviews. A bilingual assistant accompanied the interview to assist in interpretation and clarification. The researcher and her assistant met each participant individually in a quiet, private place (the researcher's apartment, the participant's house, and the Chinese church).

The interviewer asked all participants to talk about their leisure experiences, about their families, their children, and about what contributed to their enjoyment, fulfillment and satisfaction before and after their emigration to the United States. The researchers created four primary research questions (Henderson, 1991) based on the qualitative philosophical assumption that there were multiple truths which were socially constructed. The four research questions included: What activities would you consider 'recreation' in your daily life? How do your roles as wife, mother, grandmother, daughter, friend, etc. affect your recreation? Describe an experience you enjoyed doing when you were in your homeland? How did your recreation activities change after emigrating to the United States? The interviewer maintained control of the interview by reminding participants to express their opinions, giving encouraging feedback and responding to both positive and negative emotions that gained the participant's confidence and contributed to the quality of the interviews. The interviewer also recognized problems that were associated with interviewing. For instance, the participants did not understand what "leisure" meant, so some familiar words such as "recreation", "enjoyment", "relaxation", and "satisfaction" were used as synonyms (Tirone & Shaw, 1997). The interviews were tape recorded, transcribed in Chinese, and then translated in English. Following the transcriptions, the researchers compared interviews to discover themes regarding leisure experiences (Lincoln & Guba, 1985).

Findings

Following the qualitative analysis, six themes associated with traditional Chinese values and diverse life experiences emerged.

Experiences of Leisure after Emigration

The women described all of the activities in which they engaged in during a typical weekday and weekend. Watching television, walking, shopping, exercising (e.g. morning exercises), attending church and gardening were the most common activities.

I usually get up at 6:00 a.m. every morning and exercise alone in front of our house. Sometimes, my husband and I take walks around the community or exercise together.... Almost every

weekend, I go shopping with my son and daughter-in-law. I do not go anywhere to have fun, but sometimes my son takes me to church on Sundays.

I love watching Chinese videotapes. I don't understand English.... He (my son) installed a cable TV for me, so I can watch a lot of Chinese programs. I watch these programs every night and then go to bed.

The researchers then asked the women about the experiences they would consider leisure.

I think the most important thing is relaxing. For instance, if you are in a hurry while practicing Tai Chi, you cannot relax, and cannot gain health from exercise, not to mention that you cannot experience "recreation" (leisure). So I think relaxing is very important when I experience "recreation" (leisure).

Actually, I never think about it, I never even think about taking a rest.... I always think I want to do my best to take care of my husband, my children, and my grandchildren. They feel happy and so I feel happy.

The participants then talked about their personal interests and activities in which they participated in their hometowns in Taiwan and China.

After retiring, I went to exercise and practice Tai Chi with my friends in a park every morning. There was a senior's club near my house. There were many kinds of activities there, such as Tai Chi, chess, older adults' disco and something else; I sometimes went there.

The women engaged in a lot of activities when they were in their homelands in Taiwan and China. In the United States, however, they indicated that they seldom participated in activities, even those activities they enjoyed in their hometowns.

Actually, I don't engage in any activities. I know, in the United States, there is a place I can go to practice Tai Chi, but it is too far from my house, so I don't go there.... I love to exercise with friends just like I did in China; I don't like to do it alone. So, after emigrating to the United States, I just take walks with my husband; I do not do those other activities any more.

Barriers Experienced in the United States

Most participants talked about how barriers limited their opportunities to make friends and to become part of mainstream society. The amount of time they had been in the United States influenced these issues. One woman who had lived in the United States for 16 years said:

I still remember three big problems we met after our first arriving to the United States: having no car, and not being able to speak and read English. I felt I was like a mute, a blind person and a person with no feet.

Four women in this study identified cultural differences as barriers. One woman said:

I hope my children can "walk out", that is, to be involved in society; I really hope they can do so. We have been here more than ten years, but our living space is still very limited.... My children asked me many times, "Mom, why cannot we be involved in American society? Even ABC (American Born Chinese) cannot, either." I don't know how to answer; I sincerely hope they can "walk out".

Effect of Traditional Chinese Values

As the women in the study reflected on their lives, traditional Chinese values played an important role in their lives.

In traditional Chinese values, taking care of children is the most important thing, then taking care of your husband; these are more important than I am.

Childcare was the most important responsibility to these older women, especially when their children were young. In most cases, the women had no time for themselves and no time for leisure when their children were young. A good summary of this is in the following statement:

When I was in China, I was very, very busy and my daily life was like a battle. I have four children. I had to work six days a week and did a lot of housework on Sundays.... The hardest time I had was the time that my children prepared for the entrance exams and I was even more nervous than they were and could not sleep well during those periods of time because if they did not pass the entrance exam for going to college, they could not have found a job.... My life was so hectic during that time; I had no time to think about myself, not to mention time for leisure and also my health was not good either. I did not feel released until my youngest child passed the exam. It was the greatest relief to parents.

Importance of Attending Religious Activities

The language and transportation problems limited the opportunities for these older Chinese women to be involved in society and engaged in activities. Religious activities became the center of their lives and contributed to their satisfaction, fulfillment and enjoyment. The Chinese church is a social network support for the older Chinese women immigrants.

I do not feel lonely, even if I do not have a lot of friends here. I plan to engage in more religious activities and I believe I will meet a lot of friends there.

Effect of a Lack of Free Time or Leisure

The experiences of leisure were not something that the older Chinese women could easily discuss. Their roles - wife, mother, grandmother or daughter - had occupied most their time so that leisure was not central to them. One woman remarked:

I do not think being a mother affects my recreation. I never complained in front of my children no matter how tired I was.... I hardly complain because, in my opinion, a mother should do her best to take care of her family and her children. This is beyond doubt. Hence, I do not think I make a sacrifice; I do my best in whatever I need to do.

One woman summed up how important it is to take care of grandchildren:

My mother is in China now and she is 98 years old. When I stay with her, of course, I cannot go to exercise as usual. But I always think that she is old and may not have too many years to live, so I feel that taking care of her is a kind of recreation. It depends on how you look at it.... In the United States, taking care of my grandchildren has the same meaning for me.... You know, during the Cultural Revolution in China,... I had no time to get along with my children, to talk to them. Frankly speaking, I could not experience the feelings between mother and child. Now, when I take care of my grandchildren, I found the feelings I lost; I have recovered them.

Life Satisfaction and Expectations for Future

Although the women faced many problems in the United States that limited their opportunities to engage in previous recreational activities, most women still felt satisfied with their lives in the United States. They gradually adjusted to the American way of life and had high expectations for the future. One woman said:

I am getting used to living here and I really appreciate it...especially after retiring, I do not have to worry about anything; I feel released completely.

Discussion

The results of the study indicated that leisure for the women was as a state of mind or an experience that coincided with Neulinger's (1982) definition of leisure. More than half of the women thought relaxation was the first and foremost thing to experience leisure. The main concern for the women in experiencing leisure was not

what activities they engaged in, how often they participated in those activities, or how much they might benefit from doing those activities, but how they perceived the experiences (e.g., relaxing, enjoyable and satisfying). Definitions and meanings associated with leisure as typically understood by those in the leisure profession were hard for the women to comprehend. To segment leisure from work was not appropriate for investigating the meaning of leisure for the women.

The leisure activities in which the women engaged in the United States differed from those they enjoyed in their hometowns in Taiwan and China. Though barriers such as language, transportation and cultural differences changed their activities after their emigration to the United States, the women perceived pleasure, enjoyment and fulfillment by engaging in such activities as shopping and attending church. The findings implied that the women participated in different activities before and after their emigration to the United States, but the concept of leisure for the women was the same. By doing these different activities, they pursued experiences that contributed to their feelings of satisfaction, enjoyment and fulfillment.

Traditional Chinese values had a profound effect on the women. In most cases, the women had no time for themselves and no time for leisure while their children were young. They considered their children and husbands more important than themselves. Filial piety was also a very important Chinese value that promoted caring relationships between children and parents.

Attending religious activities was an important social link for the women. Because of language and transportation problems, their opportunities for being involved in society and experiencing leisure were constrained. Religious activities, instead, became the center of their lives and contributed to their satisfaction, fulfillment and enjoyment.

The women did not recognize a lack of free time or leisure as a problem. Their roles as wife, mother, grandmother and daughter had occupied most their time so that leisure was not viewed as important to them. However, almost half of the women in this study considered taking care of children and grandchildren leisure. They valued leisure in terms of how well they were able to care for their children and grandchildren. Only one disagreed because she thought taking care of children was even more important than that; it was her vocation, not her avocation.

The leisure experiences of the older Chinese women immigrants changed after their emigration to the United States. Barriers such as language, transportation and cultural differences prevented them from engaging in their previous leisure activities. These barriers, however, did not affect the women's feelings of satisfaction, enjoyment and fulfillment after their emigration. Although the women engaged in activities in the United States that were different from those they enjoyed in their hometowns, their concept of leisure remained the same. For example, why did most of the women consider taking care of children or grandchildren leisure? Why did some women prefer working at a factory after retiring? Why did some women

devote most their time volunteering at church? And why did some of the women like playing tennis or going to concerts? Engaging in these activities gave them a sense of satisfaction, fulfillment and enjoyment, and they regarded engaging in these activities as leisure. Leisure has no cultural boundaries. The women participated in different activities from those they enjoyed in their hometowns, but their concept of leisure did not change. Whether practicing Tai Chi (as the women did in their hometowns), attending religious activities (as the women did in the United States), or taking care of their children and grandchildren (which they continued to do in the United States), they pursued the same goal – to have fulfilling leisure experiences.

Leisure became more meaningful to the women only because they integrated leisure with many aspects of their lives, such as their families and religious activities. This finding is consistent with previous research involving older adults in which leisure was intertwined with life's activities (Henderson & Rannels, 1988; Kelly & Kelly, 1994; Siegenthaler & Vaughan, 1998). When investigating the experiences of leisure for older Chinese women immigrants, the qualitative paradigm provided an appropriate framework for exploring the symbolic interaction of the women.

Filial piety was another important Chinese value that maintained the caring relationships between children and parents, so most of the women in this study lived with or close to their adult children. The results implied that traditional Chinese values had a profound effect on the women. The findings corresponded to Tirone and Shaw's research (1997) in that cultural traditions from the person's country of origin continued to affect the person's life. Chinese society is based on its centuries-old feudal society. Although modernization and industrialization have changed Chinese society, patriarchy still prevails.

Recommendations

The leisure experiences of the older Chinese women immigrants changed after they emigrated to the United States. The results of the study derived from in-depth interviews reflect the characteristics of the older Chinese women immigrants in Columbia, Missouri, and suggest several implications for future studies.

First, language barriers were the most important reasons mentioned by the women that limited their opportunities to make friends with others and to be involved in society. The researchers suggest studies comparing immigrant women with diverse cultural backgrounds to see if they have the same barriers as those identified in the study and to see if their view of leisure is the same as that of Chinese women.

Second, the study raises questions about definitions of leisure for Chinese women, the effect of Chinese traditions on women's lives, the inability to segment Chinese women's lives into work/leisure dichotomies, and the centrality of family on Chinese women's lives. The themes identified here may provide hypotheses for future studies that could examine the lives of Chinese women as integrated through work, leisure, free time, religious

activities and family life. Researchers may also study whether women in Western society have the same characteristics as Chinese women. For instance, do work and leisure intertwine in Western women's lives? Is family the center of their lives? Perhaps there are similar characteristics among women from diverse cultures, and the difference is only a matter of degree.

Third, the top three barriers (e.g., language, transportation and cultural differences) experienced by older Chinese women immigrants prevented them from engaging in leisure activities, even those activities that they enjoyed in Taiwan and China. To target these barriers, local government and community officials may recruit bilingual and bicultural professionals to understand the women's needs and consult with leisure professionals to provide adequate leisure activities or programs for the older Chinese immigrant women. This issue cannot be ignored, as future Chinese immigrants will encounter the same barriers.

Fourth, the researchers suggest local communities organize educational programs for immigrant women to learn English, to understand the local customs and practices, and to learn national, state, and local laws. With the help of such services, the women may 'walk out', be close to American society and participate in leisure activities.

More and more Chinese people are emigrating to the United States, and so the number of Chinese older immigrants is increasing; their unique language and cultural barriers differentiate their leisure needs. Policy makers and practitioners should be sensitive to the needs of older Chinese immigrants and respond with policies and programs to help them with life in the United States which will contribute to their life satisfaction.

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TOWARDS AN UNDERSTANDING OF GENDER DIFFERENCES WITH RESPECT TO WHITEWATER RAFTING PREFERENCES

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Abstract: Previous literature suggests that there are an increasing number of females participating in outdoor recreation. However, the majority of outdoor programs are still designed under a male dominated paradigm. Few authors have dedicated attention to the special needs of female participants. Furthermore, very little if any attention has been given to the needs of females who assume leadership roles in the community or family and who are responsible for planning and organizing group trips to the outdoors. This lack of attention is contrary to the importance that this market can have for a commercial outdoor recreation outfitter. It is therefore important to determine what type of outdoor experiences interest this market as well as to determine their preferences and the way they establish relationships with their outdoor recreation providers. As both genders are involved in planning outdoor experiences, it is necessary to gain further insight into the differences that exist to enable marketers to create more accurate strategies for attracting clients.

The purpose of this study was to examine whether there were gender differences among individuals who take groups rafting (group leaders) with respect to the characteristics of the individual, the characteristics of the group, the type of activity sought and they type of relationships they establish with the outdoor recreation provider. The sample consisted of 279 randomly selected individuals (48% females and 52% males) who had purchased a rafting trip for eight or more people from a rafting outfitter in the Southeastern region of the United States. The data were collected with a mail survey. A 48% response rate was achieved and subsequent analysis revealed that there was no threat of non-response bias.

The analysis revealed that female group leaders were significantly more likely to take groups rafting on less challenging rivers. Females were significantly more likely to take family members and friends rafting, whereas males were the predominant leaders in church groups. There were no significant differences with respect to the trip purpose.

As for the type of customer/provider relationships established, males reported to receive more status from the provider and reported to invest more love and money in the provider. In light to these findings it is suggested that marketers of rafting outfitters and perhaps other outdoor recreation providers pay closer attention to the differences between their female and male market segments. Specifically, outfitters that provide activities with different difficulty levels should examine and rework their promotional materials to determine the attracting factors to women. In addition, outfitters should reevaluate the way they relate to their customers and assure that they implement relationship-building strategies that accommodate male and female group leaders alike.

Introduction

The predominant marketing paradigm is male dominated – all potential customers are marketed to based on preferences exhibited by males and principles defined by males. However, female group leaders can be a very important segment for outdoor recreation outfitters. It has been noted in the literature that female participation in outdoor recreation is increasing dramatically (Henderson, 2000). In addition, the female market segment is as important or more important than the male market segment. In fact, women account for more consumer dollars than men (Horowitz, 1995). Another aspect that accentuates women's importance as consumers is the notion that women are more likely to develop emotional attachments with their providers (Myers, 1994) and are more likely to share information about the provider with their friends (Popcorn & Marigold, 2000). The benefits of continuing relationships with customers and word of mouth advertising are well documented in the literature. Customers with an emotional attachment to the company are less price sensitive, more resistant to advertising form competitors, and tend to buy premium products (Morais, 2000). Another factor reinforcing the importance of the female segment is that they have a strong influence in the recreation participation of their family members. Women are the link between their generation and the next (Henderson, 2000; Simmons Market Research Bureau, 1994). Women are often responsible for the recreation choices of their children which is critical because the literature suggests that an important determinant of whether or not people will participate in outdoor recreation as an adult is whether or not they have previous experience and specifically if they participated as a child (Henderson, 2000).

This study is focused on female customers who took a group on a rafting trip with a professional outfitter. These group leaders are a very important market segment for outfitters because each group leader is responsible for bringing many customers and therefore responsible for a substantial amount of revenue. In addition, group leaders introduce the outfitter and the recreation activity to a large number of first time customers who may later come back individually (Kwortnik & Manciny, 1997; Morais, 2000). Due to their role in family groups and community groups, females often assume the position of group leaders. Most

outdoor recreation outfitters are aware of the importance of group leaders to their business and often spend substantial resources to nurture their relationships with this market segment. In contrast these outfitters have only recently started to realize the importance of marketing specifically to female group leaders. The marketing strategies targeted to this segment are typically the same as those used to target male segments.

Contrary to the undifferentiated marketing approach used by outfitters, the existing marketing literature indicates that "women and men don't think the same way, don't communicate the same way, don't buy for the same reasons" (Kotler, Bowen, & Makens, 1998, p. 131). Several authors indicated that female customers not only have different product preferences than men but they also relate with the providers of those products in very different ways (Henderson, 2000; Myers, 1994; Popcorn & Marigold, 2000). Myers (1994), for example, indicated that female consumers prefer to reduce uncertainty on their purchase decisions. Evidence of this is the observation that females tend to do more extensive research before they make a decision. In addition, females tend to place a great importance on the opportunities for interacting with other customers (Henderson, 2000; Popcorn & Marigold, 2000). With respect to customer / provider relationships, females tend to prefer collaborative processes where they are able to explain their specific needs to the provider (Myers, 1994). Myers adds that females have grown more aware of their importance as customers and have begun to demand to be treated with due respect.

The previous paragraphs explained that females are an increasingly important market segment and that they are different from men with respect to their behavior as consumers. Despite this, little literature has attempted to investigate these gender differences. Therefore, the purpose of this study was to examine whether or not there were differences between females and males who take groups rafting (group leaders) with respect to their preferences for the activity and the type of relationship they establish with the outfitter. Hence, the following research hypotheses were tested:

- Hyp 1. There are no significant gender differences with respect to river choice;
- Hyp 2. There are no significant gender differences with respect to affiliation with group members;
- Hyp 3. There are no significant gender differences with respect to trip purpose;
- Hyp 4. There are no significant gender differences with respect to group leaders' perceptions of the providers' resource investments in them (PPRI);
- Hyp 5. There are no significant gender differences with respect to group leaders' reported resource investments on the provider (CRRI).

Method

The data were obtained with a self-administered questionnaire mailed to individuals who had purchased a rafting trip with an outfitter in the Southeastern United

States. The administration process followed a modified Dillman technique consisting of one packet with a letter requesting participation in the study and the instrument, a thank you/ reminder card (one week later), and a second packet with a cover letter and an additional copy of the instrument (three weeks after the first mailing).

The sample size of the study was determined base on an a-priori Power analysis (Cohen, 1988). Despite the scarcity of its use, power analysis is seen by many authors as being the most important factor to determine sample size (Cohen, 1988; Faul & Erdfelder, 1992; Parks, Shewokis, & Costa, 1999). In order to conduct this analysis, the significance level was set to $\alpha=.05$; the desired statistical power was set to .80 ($\beta=.20$); and the effect size considered meaningful was $f=.20$. Considering these values, the necessary sample size for the study was calculated to be 194 subjects (Cohen, 1988; Faul & Erdfelder, 1992). The response rates observed in similar studies ranged between 60% and 20% (Katcham, 1990; Morais, Backman, & Backman, 1999). Consequently the surveys were mailed to a total of 600 customers.

The 600 participants were selected with a stratified proportional random sampling procedure. The strata were created based on the four rivers where the outfitter operated and based on the three seasons: Spring, summer and fall. From those questionnaires mailed out, 23 were returned because of unusable addresses. Of the 577 remaining, 279 were returned and usable for a 48.35% response rate. Due to the moderate response rate a threat of non-response bias was considered. A first test of non-response bias compared the sample and the population and found no significant differences in selected demographic variables (i.e., group size, state of residence). The threat of non-response bias was further examined by comparing the responses of participants with those from a small sample of non-respondents interviewed by phone. This analysis did not reveal evidence of non-response bias as there were no significant differences between the two groups with respect to key variables (i.e., age, intentions to repurchase a rafting trip, past purchases, word of mouth communications, information search, and resistance to counter-persuasion).

Operationalization of Dependent Variables

To test hypotheses 1, 2 and 3, categorical variables were used. The whitewater rafting provider that collaborated with the study offered rafting trips in four different rivers. The sample population was then asked to record the latest river they had rafted with the provider. The item read, "indicate in which river you took your latest trip with Outfitter A." This variable was deemed important because each river was characterized with different levels of difficulty and tended to facilitate different types of recreational experiences. To test the second hypothesis it was necessary to identify what was the affiliation of the group leaders with the rest of the group members. The hypothesis was tested with four dichotomous items. The question read, "Check the boxes that best describe your affiliation with the group members." This variable was examined because previous research has suggested that social group is a very important variable in predicting

outdoor recreation participants' motivations and preferences (Manning, 1999). Lastly, purpose of the trip was examined to test hypothesis three. Purpose of trip was assessed with five dichotomous items. The question read, "indicate what were the primary purposes of your latest trip with Outfitter A." This variable was examined because the literature reviewed indicated that males and females often have different reasons for the purchases they make.

Hypotheses four and five focused on the type of relationships established between the group leaders and the provider. To examine these customer/provider relationships a resource investment framework was used. This framework was initially developed to explain relationships of friendship by Foa and Foa (1974) and was later successfully applied to customer/provider relationships (Morais, 2000). This framework proposes that the type of relationships established between customers and providers is determined by the type of resources that they invest in each other. This study used scales developed by Morais (2000) to assess the types of investments made: the Providers' Perceived Resource Investments scale (PPRI) and the Customers' Reported Resource Investments scale (CRRRI). Both scales consisted of 14 items organized in four dimensions, anchored with 5-point frequency ordinal measurements (1=never to 5=always). Examples of items from the PPRI scales are: "the outfitter treated me as an important customer" and "the outfitter educated me about all aspects of running the trip." Examples of items in the CRRRI scales are: "I consider the outfitter's staff to be my close friends" and "I spent a lot of time and money to make this trip happen."

Analysis and Results

Although the study hypotheses do not address socio-demographic differences between females and males, the authors feel that it would be beneficial to provide a comparative description of both groups. For this purpose, adequate descriptive statistics were used depending on the level of data used. As can be observed on Table 1, participants were in average 40.3 years old, stayed an average of 2.1 nights in the region, traveled approximately 5 hours to the rafting destination, had rafted with the specific outfitter an average of 1.4 times before their last trip, and considering all rafting trips, they had rafted an average of 1.8 times. Table 1 also shows that the participants came predominantly from large cities (25.0%), small cities (25.4%), and from small towns (22.7%). Interestingly, from those participants that came from a suburb (18.8%) the majority of them were males (65.3%), and from the participants that came from a rural area (8.1%) the majority were females (76.2%). The most frequently observed types of employment were management (37.8%), sales (21.2%), teaching (16.0%), and students (10.3%). As shown in Table 1, a larger proportion of females reported sales (63.6%) and student (68.8%) as their occupations, whereas a larger proportion of males reported teaching (66.0%). Although participants belonged to households with incomes varying from lower than \$25,000 to more than \$95,000 Table 1 shows a clear gender imbalance. Specifically, whereas 61.3% of group leaders with household incomes lower than \$50,000 were females, only 38.1% of group leaders with household incomes higher than \$50,000 were females.

Table 1. Descriptive Statistics of Female and Male Group Leaders

Variable	Females <i>Mean (SD)</i>	Males <i>Mean (SD)</i>	Sample <i>Mean (SD)</i>
Age	39.3 (11.0)	41.4 (10.1)	40.3 (10.2)
Length of stay (# of nights)	2.2 (3.6)	1.9 (1.9)	2.1 (2.8)
Distance traveled (hours)	5.0 (3.6)	5.1 (3.5)	5.0 (3.5)
Times rafting with outfitter	1.4 (.8)	1.5 (.8)	1.4 (.8)
Total times rafting	1.7 (1.1)	1.9 (1.1)	1.8 (1.1)
	Frequency (% by gender)	Frequency (% by gender)	Frequency (% of total)
Residence community			
Large city	28 (43.1)	37 (56.9)	65 (25.0)
Small city	35 (53.0)	31 (47.0)	66 (25.4)
Small town	30 (50.8)	29 (49.2)	59 (22.7)
Suburb	17 (34.7)	32 (65.3)	49 (18.8)
Rural area	16 (76.2)	5 (23.8)	21 (8.1)
Employment			
Manager	29 (49.2)	30 (50.8)	59 (37.8)
Sales	21 (63.6)	12 (36.4)	33 (21.2)
Retired	2 (50.0)	2 (50.0)	4 (2.6)
Student	11 (68.8)	5 (31.2)	16 (10.3)
Manufacturing	1 (10.0)	9 (90.0)	10 (6.4)
Teacher	11 (44.0)	14 (66.0)	25 (16.0)
Craftsperson	0 (0.0)	5 (100.0)	5 (3.2)
Household income level			
Less than 55K	65 (61.3)	41 (38.7)	106 (41.9)
More than 55K	56 (38.1)	91 (61.9)	147 (58.1)

In order to test if there were gender differences with respect to trip characteristics and group leader preferences, Chi-square tests were computed. A Chi-square test conducted to examine gender differences in river choice yielded a significant effect, $\chi^2(3, N=271)=7.61, p=.055$. As shown on Table 2, females were significantly more likely to choose the Nantahala, the Ocoee and the Pigeon Rivers. In contrast males were significantly more likely to choose taking their group to the Chattooga River. Comparing the rivers preferred by females with those preferred by males it is apparent that females tended to choose recreational rivers with moderate difficulty. Males, on the other hand, tended to prefer a wild and scenic river characterized by higher levels of difficulty. Therefore, the results provided support to Hypothesis 1.

In a test of gender differences with respect to the group leader's affiliation with the members of the group significant effects were found in several variables. Specifically, Table 3 shows that females were significantly more likely to take family members rafting ($\chi^2(1, N=273)=9.29, p=.002$). The percentage of females that

reported taking family members on the rafting trip was 62% whereas only 41% of males reported taking their family members. Females were also more likely to take friends rafting ($\chi^2(1, N=273)=3.79, p=.052$). Accordingly, 66% of females reported taking friends rafting whereas only 54% of males reported the same. No gender differences were found with respect to the proportion of group leaders that took business associates rafting ($\chi^2(1, N=273)=.17, p=.677$). On the other hand, a significantly larger percentage of males reported taking members of a church group than females ($\chi^2(1, N=273)=5.49, p=.019$). In this case, 39% of males reported taking members of a church group rafting whereas only 21% of females reported the same. In sum, the results provided partial support to Hypothesis 2.

In order to test whether or not there were gender differences with respect to the group leader's purpose for the trip, Chi-square tests were computed. As shown on Table 4, the Chi-square tests conducted to examine gender differences in purpose of trip yielded nonsignificant effects ($p>.10$). Based on these findings Hypothesis 3 was rejected.

Table 2. Gender Differences in River Choice

Variables	Female		Male	
	n	%	n	%
River choice				
Chattooga	38	28.8	59	42.4
Nantahala	30	22.7	26	18.7
Ocoee	49	37.1	47	33.8
Pigeon	15	11.4	7	5.0

$\chi^2(3, N=271)=7.61, p=.055$

Table 3. Gender Differences in Group Leader's Affiliation with Members

Variables	Female		Male	
	n	%	n	%
Members of group are family				
Yes	62	47.0	41	39.1
No	70	53.0	100	70.9

$\chi^2(1, N=273)=9.29, p=.002$

Variables	Female		Male	
	n	%	n	%
Members of group are friends				
Yes	66	50.0	54	38.3
No	66	50.0	87	61.7

$\chi^2(1, N=273)=3.79, p=.052$

Variables	Female		Male	
	n	%	n	%
Members of group are business				
Yes	26	19.7	25	17.7
No	106	80.3	116	82.3

$\chi^2(1, N=273)=.17, p=.677$

Variables	Female		Male	
	n	%	n	%
Members of group are church				
Yes	21	15.9	39	27.7
No	111	84.1	102	72.3

$\chi^2(1, N=273)=5.49, p=.019$

Table 4. Gender Differences in Purpose of Trip

Variables	Female		Male	
	<i>n</i>	%	<i>n</i>	%
To be on the river	Yes	67 43.2	53 37.6	
	No	75 56.8	88 62.4	
$\chi^2(1, N=273)=.89, p=.346$				
Participate in outdoor recreation	Female		Male	
	<i>n</i>	%	<i>n</i>	%
Yes	86	65.2	83	58.9
	46	34.8	58	41.1
$\chi^2(1, N=273)=1.14, p=.285$				
Get away	Female		Male	
	<i>n</i>	%	<i>n</i>	%
Yes	27	20.5	26	18.4
	105	79.5	115	81.6
$\chi^2(1, N=273)=.18, p=.674$				
Time with friends	Female		Male	
	<i>n</i>	%	<i>n</i>	%
Yes	91	68.9	87	61.7
	41	31.1	54	38.3
$\chi^2(1, N=273)=1.57, p=.210$				
For the challenge	Female		Male	
	<i>n</i>	%	<i>n</i>	%
Yes	98	74.2	100	70.9
	34	25.8	41	29.1
$\chi^2(1, N=273)=.38, p=.539$				

In order to test whether or not there were gender differences with respect to the types of resources invested by the outfitter on the group leaders, independent samples T-tests were computed. As shown on Table 5, the analysis revealed that males reported receiving status from the provider significantly more often than females ($t(271)=9.29, p=.100$). No significant gender differences were found with respect to the group leaders' perceptions of outfitter's investments of love ($t(271)=.22, p=.829$), information ($t(271)=-.64, p=.523$), and money ($t(271)=-.837, p=.403$). These findings provided very weak support to hypothesis 4. Hence, it was concluded that female and male group leaders perceived to have received equal amounts of resource investments from the outfitter.

Independent samples T-tests were also conducted to test if there were gender differences with respect to the types of resources invested by the group leader on the outfitter. As shown on Table 5, the analyses revealed that males reported to have invested more love ($t(271)=-2.72, p=.007$) and money ($t(271)=-2.17, p=.031$) on the provider significantly more often than females. No significant gender differences were found with respect to the group leaders' investments of status ($t(271)=.61, p=.545$) and information ($t(271)=.01, p=.996$). These findings provided some support to hypothesis 5. It was concluded that male group leaders invested love and money in the outfitter more frequently than female group leaders but they did not differ with respect to investments of status and information.

Table 5. Gender Differences in Type of Investments Made by Provider and Group Leaders

Variable	Female	Male	<i>t</i>	<i>df</i>	<i>p</i>
	<i>M (SD)</i>	<i>M (SD)</i>			
PPRI					
Perceived investments of Love	2.61 (.77)	2.59 (.72)	.22	271	.83
Perceived investments of Status	2.90 (.96)	3.09 (.97)	-1.64	271	.10
Perceived investments of Information	3.15 (.88)	3.22 (.93)	-.64	271	.52
Perceived investments of Money	2.49 (1.23)	2.61 (1.34)	-.84	271	.40
CCRI					
Reported investments of Love	2.46 (.98)	2.79 (1.02)	-2.72	271	.01
Reported investments of Status	3.94 (.83)	3.88 (.84)	.61	271	.55
Reported investments of Information	2.15 (.99)	2.15 (.98)	.01	271	.99
Reported investments of Money	3.68 (.94)	3.94 (1.04)	-2.17	271	.03

Note: $N(\text{females})=132, N(\text{males})=141$

Conclusions and Implications

The purpose of this study was to examine whether or not there were gender differences among individuals who take groups rafting (group leaders) with respect to their preferences for the activity and the type of relationship they establish with the outfitter. A random sample of group leaders who took a group rafting with a commercial outfitter during 1999 were sent a mail survey assessing their river choice, type of affiliation they had with group members, the purpose of the trip, the type of resources invested between them and the outfitter, and a number of selected socio-demographic variables. Statistical analyses revealed that female group leaders were more likely to choose less challenging rivers whereas male group leaders were more represented in a more challenging and wilderness river. Females group leaders tended to bring friends and family to the rafting trip whereas males were the predominant group leaders of church groups. Males reported to have received more status from the outfitter than females and reported to have invested more love and money.

Implications for Research

The present findings are generally consistent with the literature with respect to the notion that females and males tend to develop relationships with their providers in very different ways. This study revealed that male group leaders received significantly more status and invested significantly more love and money than female group leaders. Interestingly, most of the existing relationship marketing literature does not consider the possible intervening effect of gender differences. Chaudhuri and Holbrook (2001) suggested that additional relationships marketing research might benefit from including gender in the analysis. The gender differences observed in the present study confirm these authors' proposition and therefore it is suggested that subsequent studies of customer / provider relationships should pay closer attention to gender differences.

Previous outdoor recreation literature has provided substantial evidence of differences in the preferences of various types of participants. For example Ewert (1993) reported that climbers with different skill levels preferred different types of experiences for climbing in Alaska. Ewert and Hollenhorst (1994) found additional differences in recreation preferences between rafters with various specialization levels. Literature addressing the preferences of female and male participants is, however, very scarce. This study indicates that there are such differences and due to the size and continuing growth of the female segment, it has become more important to understand them in order to more effectively market to them.

Implications for Practice

Overall, the findings indicate that outdoor recreation providers should look at females and males as two segments of their market that have different preferences and want to relate to them in very different ways. Outfitters need first to examine the various products they offer and

determine which are more attractive to females and males. Knowing this may be the first step to understanding their segments and more effectively interacting with them. In this study females were more likely to take family and friends to recreational rivers whereas males tended to prefer more challenging rivers. Subsequent research should address more specific attributes of the recreational experience besides the river characteristics and group type.

The results suggested that males invested substantially more love in the outfitter than females. These findings, however, contradict previous literature. In fact, most authors agree that females are more likely to want to establish close relationships with their providers. Hence it would be expected that they would report investing more love, status and information than males. A reasonable explanation for this discrepancy could be the notion that females did not have the opportunity to create the types of relationships they desired. Additional research is needed to further examine this hypothesis, however, the present findings indicate that outfitters need to create an atmosphere where females can develop closer relationships with them and their staff members.

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