PERCEIVED COMMUNITY BENEFITS FROM RECREATION RESOURCES: FROM SCALE DEVELOPMENT TO VALIDATION

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Abstract.—This research proposes a six-factor psychometric scale for assessing individuals' perceptions of community benefits generated from managed recreation resources. We suggested that community benefits primarily occur within six related dimensions: ecological, economic, lifestyle, quality of life, sense of physical space, and social solidarity. A 30-item scale was proposed to measure these dimensions. Data came from a mail-back questionnaire administered to residents living within 15 miles of Voyageurs National Park near International Falls, Minnesota. Confirmatory factor analysis was employed to test the convergent and discriminant validity of the proposed scale. We also tested for measurement and covariance invariance, two tests of scale reliability, using multi-group confirmatory factor analysis (CFA). Results support the validity and reliability of the scale. We suggest the perceived community benefits scale can be employed in future research to develop more valid theoretical propositions relating individuals' values and the possible outcomes they would like to see recreation resources managed for.

1.0 INTRODUCTION

Many recreation scholars and professionals have intuitively believed that the availability of recreation resources leads to benefits for local communities (Driver 2008, Driver et al. 1991, Moore and Driver 2005). In fact, many federal land management agencies are mandated to facilitate the production and delivery of desirable benefits not only to recreation users but to local communities as well (Anderson et al. 2008). Despite the longstanding use of these "outcomes-focused" management approaches, relatively little empirical research has attempted to gauge how local residents perceive the potential benefits that managed recreation resources provide to their local communities.

This paper begins to fill this gap in the recreation and natural resource management literatures in several distinct ways. First, we draw on the substantive body of recreation benefits literature (e.g., Driver 2008, Driver et al. 1991) to develop a 30-item psychometric scale of potential community benefits. Second, drawing on the same literature and several case studies of resource management areas, we hypothesize six dimensions of potential community benefits. These dimensions are: ecological, economic, lifestyle, quality of life, sense of physical space, and social solidarity. Third, we test these theoretical dimensions using two surveys administered to residents living adjacent to Voyageurs National Park in Minnesota.

2.0 SCALE DIMENSIONS

The community benefits scale developed here is concerned solely with individuals' perceptions of how managed recreation resources benefit their local communities. This cognitive approach differs from the large bodies of literature, primarily originating within the field of resource and environmental economics, which have focused on valuing the benefits produced by managed resource areas. Given this, we

define community benefits as the perceived "benefits resulting from public land management that accrue to local residents in communities nearby or adjacent to public lands" (Anderson et al. 2008, p. 312). Based upon a review of the diverse and interdisciplinary literatures that address perceived community benefits, we developed a relatively parsimonious set of six dimensions of community benefits. The six types of community benefits presented here are: ecological, economic, lifestyle, quality of life, sense of physical space, and social solidarity. Each of these benefits can be accrued by local communities adjacent to managed resource areas; these benefits are also inherently interrelated. The statement items used to measure each set of benefits are shown in Table 1.

Table 1.—Descriptive statistics, reliabilities, and standardized factor loadings for community benefits

Statement[a]	α	α if deleted	Mean Inter-Item Covariance	M	SD	Loading	Unique-ness
Ecological	.93		.85				
A greater retention of distinctive natural landscape features		.93		3.88	1.10	.74	.45
Improved soil, water, and air quality		.92		4.14	1.07	.83	.31
A sense of security that the natural environment will not be lost		.90		4.06	1.08	.91	.18
A place to conserve various natural and unique ecosystems		.91		3.92	1.08	.88	.22
Knowing conserved natural resources exists for future generations		.91		4.10	1.07	.89	.20
Economy	.93		.89				
Having a more stable economy within my community		.90		4.16	1.10	.92	.16
Increased job opportunities within my community		.91		4.16	1.13	.89	.21
Attracting tourism dollars to my community		.92		4.14	1.11	.80	.36
Having a more stable economy for the surrounding region		.90		4.18	1.05	.93	.14
Gaining financially by using natural resources		.93		3.78	1.15	.72	.48
Lifestyle	.88		.71				
More community involvement in recreation		.85		3.72	1.13	.73	.46
A greater concern for the natural environmental among residents		.85		3.95	1.05	.80	.36
Increased knowledge about the area's cultural resources		.83		3.75	1.01	.86	.27
A chance for local people to maintain an outdoor-oriented lifestyle		.85		4.12	1.09	.78	.40
Opportunities for residents to grow spiritually		.88		3.46	1.19	.67	.55
Quality of Life	.92		.81				
Heightened sense of community satisfaction		.92		3.70	1.12	.72	.48
Living in a healthy environment		.90		4.31	1.03	.87	.25
Opportunities for exercise that improve local people's health		.90		3.86	1.09	.83	.32
Providing a good quality of life		.88		4.10	1.10	.89	.20
A higher quality of life		.89		4.05	1.08	.84	.29
Sense of Physical Space	.92		.85				
A greater ability to preserve small-town feeling of your community		.91		3.63	1.20	.78	.39
Better maintenance of community infrastructure		.90		3.71	1.14	.81	.34
Greater retention of community's distinctive architecture		.91		3.38	1.11	.78	.39
Improved care for community aesthetics		.90		3.93	1.12	.83	.31
Feeling that your community is a special place to live		.90		3.97	1.16	.84	.30
Having a better sense of my place within my community		.90		3.49	1.13	.81	.35
Social Solidarity	.91		.94				
A stronger sense of community togetherness or cohesion		.87		3.66	1.15	.90	.19
A stronger sense of family bonds within the community		.88		3.55	1.19	.86	.27
A natural setting in which your community takes great pride		.89		3.96	1.14	.81	.35
A feeling of community pride		.89		3.81	1.13	.80	.37

[a] Respondents were asked to indicate the importance of the statement item relative to their community's relationship with the recreation resource on a scale where 1 = Very Unimportant through 5 = Very Important.

2.1 Ecological Benefits

Ecological benefits are a product of managed recreation resources. By conserving natural landscapes, managed resource areas provide a host of ecological benefits. The conservation of wildlife habitat, the facilitation of carbon sequestration, and the protection of water quality, are all prime examples of benefits that communities receive from the management of recreation resources.

2.2 Economic Benefits

Recreation resources can draw visitors and tourists to local communities and their expenditures can fuel local sales receipts and provide what would otherwise be unattainable levels of economic growth (Stein et al. 1999). However, economic benefits produced by managed recreation resources are often perceived as having a substantial negative influence on local community life as well (Davenport and Anderson 2005). Regardless of how they are perceived, managed recreation resources can, and often do, play a substantial role in local and regional economies.

2.3 Lifestyle Benefits

Communities with managed recreation resources can become associated with specific types of lifestyles and group identities (Carroll et al. 2005, Field and Burch 1988). As a result, the role that resource areas play in sustaining particular lifestyles can be perceived as a substantial benefit for local communities, and one that contributes to local residents' satisfaction. Several examples are recurrent in the literature: retirees developing local social enclaves in amenity-rich areas (e.g., Gosnell and Abrams 2009, McCool and Kruger 2003); adventure-seeking young professionals (e.g., Florida 2005, McGranahan and Wojan 2007); and occupational lifestyles like logging (Carroll et al. 2005) or fruit and fungi harvesters (Carroll et al. 2003, McLain 2000).

2.4 Quality of Life Benefits

Leisure services provided through managed resource areas can strongly contribute to individuals' overall feelings of satisfaction with their communities (Allen and Beattie 1984). Logically, individuals' satisfaction with their local communities depends on the ability of the community and its surrounding environment to meet their needs and desires. When needs and desires are met through the provision of recreation opportunities or other tangible benefits that individuals value, residents are more likely to be satisfied with their community and believe that the resource area helps produce a higher quality of life (Marans 2003).

2.5 Sense of Physical Space

Over time, communities adjacent to managed recreation resources can develop distinct architectures and aesthetic traits. The physical development of resource-associated communities often results from conscious efforts on the part of local developers and city officials to develop a distinct community identity in order to increase tourist flows and local tax revenues. Regardless of the causal mechanisms for developing a distinct sense of physical space, unique physical and aesthetic characteristics can be associated with being located adjacent to a managed recreation resource area.

2.6 Social Solidarity Benefits

The settings provided by managed areas can facilitate social bonding which can, in turn, lead to increased feelings of social solidarity and a shared sense of community (Mann and Leahy 2010). Furthermore, the physical settings of managed resource areas are often used by local organizations (e.g., civic, religious, and professional organizations) for social functions and gatherings. Managed recreation resources, therefore, may provide the functional requirements for social solidarity to develop within local communities.

3.0 METHODS

3.1 Data Collection

Data were collected from residents living within 15 miles of the Voyageurs National Park in Minnesota. Roughly half of the population around the National Park lives within the community of International Falls (2000 population = 6,703). Given this, we stratified our sampling frame into two populations, those living in International Falls and those living elsewhere around the Park. The two study populations were

generated using tax records and addresses included in local phone number listings. From each of the study populations, we generated a random sample of 575 households. Mail questionnaires, administered according to Dillman's Tailored Design Method (2007), were sent to each of the selected households. Within International Falls, a total of 506 questionnaires were deliverable; of these, 313 were returned completed for a response rate of 62 percent. For the questionnaires administered to other residents around the Park, a total of 490 were deliverable; of these, 297 were returned completed for a response rate of 61 percent. Given that both response rates were above the 60 percent recommended by Dillman (2007), a non-response bias analysis was not necessary.

3.2 Data Analysis

The mail questionnaire contained the 30-item community benefits scale (Table 1). Respondents were asked to indicate how important it was to them that Voyageurs National Park was managed to produce each statement item. The data generated from the scale was analyzed using confirmatory factor analysis (CFA). The CFA process proceeded through two distinct phases. First we utilized CFA on data from each of the two samples independently to ensure that our hypothesized six-dimensional model provided an adequate fit to both samples. In assessing model fit, we used the following criteria adopted from Kline (2005) and Hu and Bentler (1999): the maximum likelihood χ^2 (smaller values indicate better model fit); the relative χ^2 (χ^2/df) (values of 3 or less indicate acceptable model fit); the root mean-square error of approximation (RMSEA) (values of less than .08 indicate acceptable model fit); the Akaike Information Criteria (AIC) (lower values represent better model fit); the expected cross-validation index (ECVI) (lower values represent better model fit); the comparative fit index (CFI) (values nearer to 1 indicate better model fit); and the non-normed fit index (NNFI) (values nearer to 1 indicate better model fit). The second phase of analysis used multi-group CFA to determine whether or not measurement weights and covariance coefficients were invariant across both samples. If the measurement weights are invariant across samples, we can be assured the measurement items are measuring identical constructs for both sets of data. Similarly, testing for invariance in the covariance coefficients allowed us to determine whether the relationships between the six community benefit dimensions are similar across samples. If covariance invariance is found, we can have a greater amount of confidence in the reliability of the proposed community benefits scale. For both invariance tests, if the $\Delta CFI \leq .01$ from the multi-group configural model to the subsequent constrained model, invariance is supported (Cheung and Rensvold 2002).

4.0 RESULTS

4.1 Scale Reliabilities

Each community benefit was measured with four to six observed variables (Table 1). The internal reliabilities (Cronbach's alpha) of each of the hypothesized community benefits were satisfactory, ranging from .88 to .93. Support for item-scale validity was also seen in the high levels of inter-item covariance ($\geq .71$), more than adequate factor loadings ($\geq .72$), low uniqueness values ($\leq .48$), and the fact that removal of no singular item reduced a dimension's reliability (Table 1, Column 2). These initial results suggested that the scale contained a high degree of item-scale validity and that subsequent CFA was warranted.

4.1 Confirmatory Factor Analysis

The fit indices for the hypothesized six-dimension models are shown in Table 2. We initially estimated model fit using each sample individually and then assessed model fit for the pooled sample. Following the fit criteria described above, we found that the data from each sample, as well as the pooled sample, provided a good fit to the hypothesized model. Given adequate model fit, we next examined the correlations among the six latent community benefits (Table 3). The correlations were high and statistically significant at the .05 level. The presence of high levels of inter-correlation among latent dimensions indicates there is a considerable level of codependence between each of the perceived community benefits dimensions.

Table 2.—Goodness-of-fit indices and measurement and structural invariance test statistics

Model	χ^2	*Df*	χ^2/df	RMSEA [90%C.I]	AIC	ECVI [90%C.I]	CFI	NNFI	$\Delta\chi^2$	ΔCFI
Confirmatory Factor Analysis										
Pooled Sample	1183.72	373	3.17	.06 [.06, .06]	1367.72	2.25 [2.08, 2.42]	.90	.88	—	—
International Falls Sample	891.84	373	2.39	.07 [.06, .07]	1075.84	3.45 [3.18, 3.74]	.88	.85	—	—
Other Residents Sample	846.55	373	2.27	.07 [.06, .07]	1030.55	3.48 [3.21, 3.78]	.88	.85	—	—
Invariance Tests										
Multi-group Configural Model	1738.39	746	2.33	.05 [.04, .05]	2106.39	3.46 [3.27, 3.67]	.88	.85	—	—
Multi-group test of measurement invariance	1761.69	770	2.29	.05 [.04, .05]	2081.69	3.42 [3.23, 3.63]	.88	.85	23.3	.00
Multi-group test of covariance invariance	1804.79	791	2.28	.05 [.04, .05]	2082.79	3.43 [3.23, 3.64]	.88	.84	66.4	.00

Table 3.—Correlations among latent dimensions

	Dimension				
Dimension	Ecological	Economic	Lifestyle	Quality of Life	Sense of Physical Space
Economic	.75				
Lifestyle	.80	.76			
Quality of Life	.85	.84	.88		
Sense of Physical Space	.75	.78	.88	.88	
Social Solidarity	.68	.74	.83	.81	.88

Note: All correlations are significant at the .05 level.

In summation, the presence of high item-scale validity, illustrated through the adequate alpha values, factor loadings, and low uniqueness values, lend support for the convergent validity of the community benefits scale. The overall acceptable levels of model fit across the two samples lend support for the reliability of the six-dimension model of community benefits. Scale reliability was further tested in the subsequent invariance tests.

4.2 Multi-Group Analysis

To test for measurement and covariance invariance, we first estimated a baseline configural model from both samples simultaneously. As expected given the results from the previous section, the fit of the multi-group configural model was acceptable (Table 2). The CFI and RMSEA values were .88 and .05 respectively. With these baseline statistics established, we subsequently constrained the measurement weights (factor loadings) and intercepts to be equal across both samples and re-estimated model fit. The fit indices for the constrained model were again adequate (Table 2) and the CFI statistic was .88. Given that the change in CFI between the configural model and the constrained model was less than .01, measurement invariance was supported. The six-dimension scale of community benefits measured the same latent constructs for the International Falls sample as it did for the sample of those living elsewhere around the Park.

Next we tested for covariance invariance by adding the additional constraint of setting covariance estimates to be equal across both samples and re-estimating model fit. The fit indices for the constrained model were adequate (Table 2) and the CFI statistic did not change. These results support covariance invariance between the two samples. More simply put, the relationships between latent factors were equivalent for both sets of data. These findings lend increased support to the reliability of the proposed community benefits scale.

5.0 DISCUSSION AND CONCLUSIONS

The community benefits scale developed here provides a means by which resource managers can assess what people living in close proximity to recreation resources would like to see those areas managed for. Understanding these potential benefits is essential to meeting the needs and desires of local residents and, in turn, developing strong collaborative relationships with mutual understanding (Davenport et al. 2007a, Davenport et al. 2007b, Wondolleck and Yaffee 2000). The scale provides both a barometer by which each of the community benefit dimensions can be measured and a mechanism to analyze, in a comparative and standardized fashion, variations in desired benefits. In sum, the community benefits scale is not only valid and reliable but also has practical value to community stakeholders and resource area managers. The initial scale development process illustrated here is integral for providing resource managers with substantive concepts around which planning and decisions can be based. Furthermore, empirical validation of the community benefits scale may prove integral in launching new lines of inquiry in the fields of recreation and natural resource management.

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