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Special Issue

Social Justice Issues in Parks and Recreation

Fee Hikes at State Parks in Georgia: Effects on Visitation, Revenues, Welfare, and Visitor Diversity

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Fee Hikes at State Parks in Georgia: Effects on Visitation, Revenues, Welfare, and Visitor Diversity

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Executive Summary

Public land management agencies that provide outdoor recreation opportunities face financial constraints. Raising access fees is one approach to enhance fiscal sustainability. However, increased access costs may reduce visitation. Actual visitation changes are contingent on visitors' price sensitivity, and these changes will influence revenue collection, visitor composition, changes in visitor welfare, and local economic impacts. Importantly, higher entrance fees may disproportionately affect visitors of different ethnicities and individuals from low-income populations. In this study, we developed a travel cost model using data collected during 2010 from 1,309 visitors across three

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state parks in northern Georgia to estimate the structure of recreation demand and the effects of potential fee increases across diverse populations. Results were applied to simulate the effects of various entrance fee levels on park revenue, visitor diversity, and visitor welfare, accounting for differential responses to fee hikes across different racial/ethnic groups. We found visitor demand to the parks was largely inelastic, signaling that decreases in visitation effected by a modest fee increase (e.g., from \$5 to \$8) would lead to higher total revenues. At higher fee values, decreased visitation offset potential revenue gains. Hispanics were less sensitive to entrance fee hikes than other visitors, suggesting that shifting fee structures could also impact visitor composition. If fees were to increase at state parks, the proportion of Hispanic visitors at parks would likely grow. This means that Hispanics would bear a disproportionate share of the cost burden under increasing fee scenarios. Additionally, state park recreation demand was highest among low-income visitors, suggesting that fee increases could have particularly significant negative impact on that group. To balance the possibly competing agency objectives of revenue generation and increased diversity, park managers may benefit from greater *ex ante* information provided by an applied framework like that developed in this analysis. Such analyses are expected to better inform management and policy makers concerning the likely economic effects of variation in state park access costs, including disproportionate impacts on racial/ethnic minorities.

Keywords

Price elasticity, race/ethnicity, recreation demand, state parks, travel cost method, user fees

Introduction

Public land management agencies tasked with providing outdoor recreation opportunities have experienced heightened budget pressures in recent years as demand for their services has increased and appropriations from their governing bodies have declined (Bowker et al., 2012; More & Stevens, 2002; Van Sickle & Eagles, 1998). Currently, government transfers support only about a third of the typical agency budget (Walls, 2013). Agencies have adopted a number of mitigation strategies to close these budget gaps, with most involving a mixture of revenue enhancements via on-site or external contributions and expenditure reductions (Beitsch, 2014; Shneider & Budruk, 1999; Walls, 2013).

Among the most prevalent tools to generate extra-governmental revenues for access to public outdoor recreational opportunities are user fees (Harris et al., 1987; Schneider & Budruk, 1999; Schwartz & Lin, 2006). State parks, in particular, have become more reliant on user fees for revenue support as general fund appropriations have contracted in recent decades (Baker, 2011; Essig, 2011). User fees include daily entrance or parking fees; charges for activities such as fishing, swimming, or golfing; facility fees for shelters, campgrounds, and other accommodations; rental charges for equipment such as boats and golf carts; and other fees for various services provided and amenities offered at state parks. The revenues generated are substantial. Fee receipts already exceed agency expenditures for parks divisions in many states, and several have already become 100% self-sufficient (Bietsch, 2014; Leal & Fretwell, 1997). Revenue

generated onsite has become increasingly important to national parks as well (Miller et al., 2018). Practical outcomes of user fee programs include enhanced cost recovery for management agencies, rationing public land access in congested or highly impacted protected areas, and educating participants concerning agency objectives and purposes for collecting fee revenue (Oh & Hammitt, 2010). Additionally, levying fees for services or events that would not otherwise be offered (e.g., interpretation programs) provides financial justification for their provision and allows agencies a measure of independence from public fund appropriations and associated political influences (Laarman & Gregerson, 1996). Despite their prevalence, the pricing of user fees for outdoor recreation is both a technically difficult and politically sensitive aspect of park management (Crompton, 2011).

A substantial body of research has gauged public acceptance for user fee programs to support outdoor recreational opportunities (Miller et al., 2018). Most have found the public either indifferent or mildly supportive of user fees, at least when used in combination with public tax subsidies (Bowker, Cordell, & Johnson, 1999; Burns & Graefe, 2006; Ostergren, Solop, & Hagan, 2005). Fee acceptance has been correlated with a number of participant characteristics, including previous experience paying fees (Kerr & Manfredo, 1991; McCarville et al., 1996), socioeconomic features, such as income, education, and ethnicity (More & Stevens, 2000), place attachment (Chung et al., 2007; Kyle, Absher, & Graefe, 2003), social equity perceptions concerning fee appropriateness and distributional fairness (Chung et al., 2011; Kyle, Graefe & Absher, 2002; Park et al., 2010), and trust in the land management agency (Winter, Palucki, & Burkhardt, 1999).

The methods by which management agencies frame user fees have also been shown to affect acceptability (McCarville et al., 1986; Miller et al., 2018). Most framing strategies attempt to influence participants' reference price with respect to fees, either by providing details concerning the cost of delivering recreational experiences or about the cost of similar substitute experiences (McCarville & Crompton, 1987). Higher rates of acceptability have also been found with participants who agree with the purposes with which fee revenues are used (Chung et al., 2011; Vogt & Williams, 1999) and if the revenues remain with the management agency (Reiling et al., 1994). Of the factors correlated with decreased support for fee regimes, fee levels and general dissatisfaction with the management agency are most often mentioned (Ostergren et al., 2005; Reiling et al., 1994; Winter et al., 1999).

Philosophical justifications for user fees for recreation on public lands turn on a number of normative arguments, most concerning the methods by which providing such opportunities should be financed. Acknowledging that all citizens enjoy indirect benefits of public lands (e.g., existence values, ecosystem services), those supportive of fee regimes suggest avid users enjoy a larger relative share of on-site benefits and should therefore bear a greater proportion of their provision and maintenance costs (Bowker, Cordell, & Johnson, 1999; Ostergren et al., 2005; Park et al., 2010). Fees shift the financial burden of providing outdoor recreation opportunities from tax revenues, collected from participants and non-participants alike, toward a model where active participants provide a larger share of the cost of provision.

On the other hand, fee critics generally contend that public lands for outdoor recreation are a public good with widespread benefits (use and nonuse), therefore their finance should be the responsibility of all citizens. Moreover, some claim that requiring

active users to pay additional fees is double taxation (Dustin, More, & McAvoy, 2000; Harris et al., 1987). Arguments of this type are based on egalitarian principles of social democracy, and generally lean toward the belief that all citizens should have access to outdoor recreation opportunities without additional costs. Fee critics also contend that if user fees prevent access to public lands by members of society who lack sufficient financial resources, democratic principles are violated and the entire reasoning for providing public lands becomes questionable (Buckley, 2003; Cockrell & Wellman, 1985; More, 1999; Park et al., 2010).

The extent to which user fees affect recreation participation across demographically diverse groups is a popular subject in the outdoor recreation literature, in large part because economic theory suggests fee increases will necessarily reduce aggregate benefits to park visitors if visitation declines (Varian, 2010). Price response to fee increases may not be homogeneous if certain segments of visitors respond differently to fee changes. Additionally, if user fees have disproportionate effects on different demographic groups, then reductions in benefits (i.e., social welfare) may negatively impact those groups in a similar manner. Through this lens, fee policies can become a social justice issue (More & Stevens, 2000). The economies of nearby communities may also suffer if visitor demand is highly price sensitive, as these communities benefit from the economic impacts generated by visitor expenditures.

Previous research has examined interactions between user fees and participant demand in various contexts, including general visitation (Schwartz & Lin, 2006), agency revenues (Kyle et al., 2002; Teasley, Bergstrom, & Cordell, 1994), user welfare (Hesselyn, Loomis, & Gonzalez-Caban, 2004; Hynes & Green, 2013), user diversity (Bowker & Leeworthy, 1998; More & Stevens, 2000; Schneider & Budruk, 1999), and local economic impacts (Cline & Seidl, 2010). Applied studies usually either examine participation rates *ex ante* (Reiling et al., 1994, Schroeder & Louviere, 1999; Teasley et al., 1994) or *ex post* (Krannich, Eisenhauer, Field, Pratt, & Luloff, 1999; Schwartz & Lin, 2006), most finding fees decreased aggregate participation.

The distributional and equity effects of pricing policies have also been studied, with the majority of research focused on the extent to which moderate and lower-income participants are priced out by user fees (Burns & Graefe, 2006; Huhtala & Pouta, 2008; More & Stevens, 2000; Reiling et al., 1994; Reiling, Cheng, & Trott, 1992). Most studies found would-be participants of lower incomes less willing to pay access fees for outdoor recreation. For example, Bowker and Leeworthy (1998) found Hispanic visitors to the Florida Keys were more price sensitive than whites. If minority visitors are relatively more price sensitive, the use of fees as a tool to increase agency revenues could conflict with management objectives related to increasing ethnic diversity among visitors. Furthermore, if the implementation of higher user fees enabled managers to capture additional revenue from visitors' consumer surplus (the amount they would be willing to pay minus the amount they actually pay), that loss in benefits would result in reduced visitor welfare (Freeman, 2003). Thus, public land managers and policy-makers could benefit from a more comprehensive understanding of participants' price response to increased fees, including potential impacts on different demographic populations, as well as the overall effectiveness of this type of revenue-generating strategy (Kriesel, Landry, & Keeler, 2005).

Our primary objective in this study was to examine the effects of user fee increases on the compatibility of agency objectives in the context of Georgia state parks. Specifi-

cally, we developed a static demand model to estimate how park visitation changed at different price structures, accounting for a number of other factors including income and race/ethnicity. We used the Travel Cost Method (TCM) to model visitor demand for three state parks, then used the results to simulate potential net and distributional effects of a hypothetical user fee increase on the agency's goals of revenue generation, enhancing participant diversity, and maintaining or increasing user benefits. The study provides an applied framework that will allow public land managers a greater degree of *ex ante* insight into the economic effects and management implications of agency policies that affect outdoor recreation.

Methodology

The basic concept of consumer demand explains the theoretical framework for analyzing the economic effects of potential state park fee increases on park visitation (Varian, 2010). If recreation at state parks is an ordinary good, economic theory postulates that quantity demanded (visitation) will decrease as its price (e.g., user fees) increases. It follows that, although additional admission fees could increase park revenue, visitation is expected to decline in response (Kyle et al., 2002). The extent to which revenue will increase depends, in part, on visitors' price response, or their price elasticity of demand. Price elasticity measures demand sensitivity to changes in the price of a commodity, calculated as the percentage change in quantity demanded divided by the percentage change in price (Varian, 2010). Higher fees can be expected to effect a more than proportional decrease in the number of visits if demand is elastic, or less than proportional if inelastic, all else being equal. The majority of empirical studies indicate that price elasticity for outdoor recreation activities is typically inelastic (Loomis & Walsh, 1997). Importantly, these price effects may differ for different visitor segments.

Figure 1 presents a theoretical framework, following Teasley et al. (1994), depicting potential effects of a fee hike on park visitation and revenue. The demand curve ($x_1(p_1 | p_2, M)$) shows the quantity of visits to the state parks (x_1) as dependent on trip price (p_1), holding income (M) and all cross-prices (p_2) constant. Under current conditions, visitors pay p_1 per trip, with an admission fee of ($\text{fee} = p_1 - T$) and travel expenses T . The fee revenue captured by the park management agency is area p_1CGT . The area TGq_0 represents total visitor travel expenses. Increasing the admission fee to ($\text{fee}' = p_1' - T$) results in visitation decreasing to q_1' . The decline may or may not be the same for park visitors of different ethnicities. Park management is able to capture additional revenue from the decrease in visitors' consumer surplus equal to $p_1'BFp_1$. However, the decrease in visitation results in the agency losing revenues equivalent to the area $FCGH$. Total park revenue is now $p_1'BHT$, which will increase if the additional revenue ($p_1'BFp_1$) is greater than that lost ($FCGH$). This depends on visitors' price elasticity of demand, which determines the decrease in visitation expected to result from an increase in admission fee, or the distance between q and q_1' .

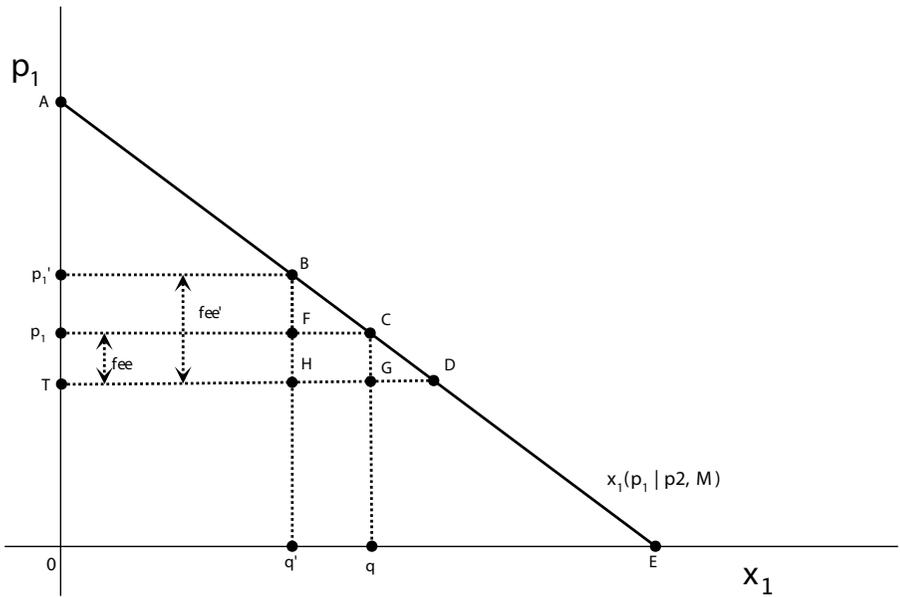


Figure 1. Economic effects of an increase in admission fee at a state park (P_1) on the quantity of visit demanded (X_1).

Sample and Data Collection

State park visitor data were collected via intercept surveys at three parks in northern Georgia (Fort Mountain, Fort Yargo, and Red Top Mountain) during summer 2010. Parks were purposefully selected based on their wide range of similar recreation activities, high annual visitation rates, and high levels of racial and ethnic diversity among visitors. When data were collected in 2010, the entrance fee (technically a parking fee) for Georgia State Parks was \$5 per vehicle. Park fees were not charged on Wednesdays. Visitors also had the option of purchasing annual admission passes for \$50.00.

During intercept survey sessions, researchers stationed at “recreation hotspots,” or high-volume day use areas (e.g., beaches, picnic areas) and campgrounds, approached visitors 18 years of age or older to participate in a brief survey about state park use. Visitors who agreed (91.5% response rate, $n=5192$ across all three sites) were given a version of the survey instrument, which varied randomly and was available in Spanish or English. A 2010 pilot study pretested the survey instrument, and five different survey modules were used. Two of the five modules contained information specifically focused on user fees and factors affecting park visitation, including distance traveled to parks. Responses to these two survey modules ($n = 2077$) were used for this analysis. Questions on both versions were also designed to elicit information on respondents’ visitation frequency and socioeconomic characteristics; including gender, age, race/ethnicity, education, household size, place of residence, and income.

Travel Cost Model Specification, Estimation, and Analysis

The travel cost method (TCM) is a common approach of estimating economic value of outdoor recreation sites using recreational revealed preference data. The TCM assumes a weak complementary relationship between the necessary expenses incurred while traveling to a site and visitors' choice to consume recreation there (Haab & McConnell, 2002). The number of visitors' trips (visitation) serves as a proxy for quantity demanded, and the necessary travel costs associated with each trip serves as a proxy for price. These travel costs include both travel-related expenses (e.g., user fees and mileage costs) and, in some models, the opportunity cost (OC) of time spent traveling (Phaneuf & Smith, 2005). Variation in visitation response to different levels of travel costs provides the basis for estimating recreation demand with respect to multiple factors including socio-demographic variables (Freeman, 2003). We adopted a regional demand model where the state parks sampled were assumed to be representative of northern Georgia state parks.

The TCM is primarily based on a generic demand model derived from visitors' time and income, which can be expressed as (Joshi et al., 2017):

$$\sum_{j=1}^n X_{ij}C_{ij} + Z_i \leq Y_i, \quad (1)$$

Where, X_{ij} denotes a number of trips by individual i to site j ; C_{ij} represents travel costs; X_i and Y_i are other costs during the trip and total income, respectively. The number of observed trips is a non-negative integer and truncated at zero, referring to the positive and discrete distribution of the quantity of trips taken by each respondent. Count data models based on the Poisson probability density function are a common econometric specification where the dependent variable is the number of trips. The basic Poisson probability density function for a single site recreation demand model is represented as:

$$\Pr(\text{trips}_j | x_j, \beta) = \frac{e^{-\lambda_j} \lambda_j^{r_j}}{r_j!}, j = 0, 1, 2, \dots, N, \quad (2)$$

Where x_j is the set of model explanatory variables; $\lambda_j = x_j \beta$ is the mean and variance of the distribution; and β represents model coefficients to be estimated.

Because the data used in this analysis were taken from an on-site survey, they are zero-truncated and possibly endogenously stratified. Endogenous stratification, or avidity bias, is another characteristic of choice-based, on-site samples that can cause problems in demand estimation (Martinez-Espineira et al., 2006). The choice to participate (visit) in an on-site sample is made by each respondent, and the probability of inclusion in the sample is directly related to that choice. For example, an individual who visits Fort Mountain State Park four times during the summer is four times more likely to be interviewed by researchers than someone who visits only once. Thus, our TCM used a Poisson estimator adjusted for zero truncation and endogenous stratification by subtracting one from each group's reported number of annual visits, a procedure developed by Shaw (1988). The empirical TCM model link function was specified as:

Intrips_j

$$= f(\text{tcost}_j, \text{subsite}_j, \text{income}_j, \text{age}_j, \text{male}_j, \text{grpsize}_j, \text{FM}_j, \text{FY}_j, \text{freeday}_j, \text{hisp}_j, \text{black}_j, \text{hispcost}_j) \quad (3)$$

The unit of recreation consumption used in TCM was the traveling unit or group. Notably, 96.5% of the sample visited the park with at least one other person. Other studies also employ the assumption that the traveling unit or group generally dictates visitor trip-taking behavior to parks, in large part because most people arrive in cars (Englin, Boxall, & Watson, 1998; Loomis & Walsh, 1997; Sardana, Bergstrom, & Bowker, 2016). In all cases, individual responses to the survey instrument were assumed to be representative of the visitor group. Individual estimates were obtained by scaling results by group size after model estimation.

The dependent variable in the TCM was the number of group trips taken to the park in the previous 12 months (*trips*). A detailed description of each variable in the model is presented in Table 1. Travel cost (*tcost*) was calculated based on mileage traveled to the park without time cost (Parsons, 2003). Average per-mile operating expenses for the cost component of full-trip costs was estimated at \$0.1674 per mile in 2010, including the costs of fuel, oil, tire wear, and maintenance for the average sedan (AAA, 2010). Respondents' self-reported distances and zip codes provided information on the distance component of transportation expenses. Park entrance fees were added as an additional travel cost, following Rosenberger and Loomis (1999). The fee portion of the travel cost variable specification for respondents that visited on the free admission day (Wednesday) was zero.

Because descriptive statistics revealed potential park difference effects, the pooled multi-site TCM included park-specific dummy variables (*FM* and *FY*) to account for this between-park heterogeneity. Other independent variables in the TCM included availability of substitute sites based on responses to a Likert-type survey item (*subsite*), group size (*grpsize*), free day attendance if the respondent visited the park on free admission Wednesdays (*freeday*), household income (*income*), education (*college*), age (*age*), gender (*gender*), and the primary focus of this study: ethnicity. Because of the focus on racial/ethnic minorities, ethnicity was coded using dummy variables for Hispanic (*hisp*), African American (*black*), and non-Hispanic populations (predominantly whites and Asians), reflecting the approach adopted by Thapa, Graefe and Absher (2002). Following Kim, Shaw, and Woodward (2007), any missing income observations were replaced with a value imputed from an auxiliary log-linear ordinary least squares regression of reported income on ethnicity, age, education and gender.

To assess variation in price response due to ethnicity, we adopted a varying parameters approach (Bowker & Leeworthy, 1998). The model was estimated with ethnic dummy variables and dummy-travel cost interaction terms. These slope interaction terms allowed the price relationship to vary based on ethnic characteristics, and the effect of ethnicity on consumer surplus and price elasticity may be derived from the interaction term coefficients. Because the proportion of African Americans in the sample was too small to yield reliable estimates, the ethnicity-travel cost interaction term (*hisp x tcost*) was only assessed for Hispanics.

To account for potential multipurpose visits, for which TCM is not theoretically applicable, we truncated observations in the top five percent of distance traveled (Betz,

Bergstrom, & Bowker 2003; Zawacki, Marsinko, & Bowker 2000). Thus, the estimation sample was truncated at 150 miles. Observations with missing values for travel distance and annual trips were excluded, as these are necessary characteristics for travel cost analysis. Groups reporting trips more than five standard deviations from the sample mean were considered outliers and excluded as well. Additionally, because the preferences for very large groups traveling together (e.g., a family reunion, church or school group) cannot be assumed similar to those of a group of four (e.g., a hiking group), and behavioral models cannot simultaneously model demand for both, groups of more than eight individuals were eliminated from the estimation sample (Chapagain et al., 2018). After applying these filters, the estimation sample size was reduced to 1309 (Table 1).

Table 1

Variables Used in TCM Estimation for Georgia State Park Visitor Sample

<i>Variables</i>	<i>Variable descriptions</i>
trips	Annual number of group trips taken to the park
tcost	Travel costs: round-trip distance to the park multiplied by \$0.1674/mile + \$5 admission fee
subsite	Substitute site dummy variable indicating whether or not respondent feels there are available substitutes for the park visited
income	Annual household income (\$1000's)
hispanic	Hispanic dummy variable = 1 if respondent is Hispanic, = 0 otherwise
black	Black dummy variable = 1 if respondent is Black, = 0 otherwise
age	Respondent's age
male	Gender dummy variable = 1 if respondent is male, = 0 otherwise
FM	Dummy variable for Fort Mountain visitors = 1 if surveyed at Fort Mountain, = 0 otherwise (RTM was reference park)
FY	Dummy variable for Fort Yargo visitors = 1 if surveyed at Fort Yargo, = 0 at otherwise (RTM was reference park)
grpsize	Size of traveling group
freeday	Dummy variable = 1 if respondent visited park on a Wednesday, = 0 otherwise
annpass	Dummy variable = 1 for annual pass holders, 0 otherwise

Price Elasticity, Expected Revenue, Visitor Proportions, and Visitor Welfare

We used estimated price elasticity values to evaluate the likely change in park visitation affected by variation in the entrance fee structure (Ellingson & Seidl, 2007; Teasley et al., 1994). Variation in visitation at different fee levels allowed us to evaluate the effects of higher fees on our primary outcomes of interest: revenue generation, visitor diversity, and visitor welfare. Since the empirical TCM model was specified in the common, log-linear form, the price elasticity was calculated as:

$$\varepsilon_{ij} = \beta_{tcj} * \overline{TC_{ij}} \quad (4)$$

Where, $\beta_{tc} = (\beta_{tcost} + \beta_{hispcost})$ for Hispanic visitors and $\beta_{tc} = \beta_{tcost}$ for non-Hispanic visitors; ϵ_{ij} and TC_{ij} denote the price elasticity of demand and mean travel costs associated with fee level i and ethnicity j , respectively. As noted above, estimated price elasticity for Hispanic visitors was derived as the sum of the travel cost and the Hispanic-travel cost interaction term coefficients multiplied by Hispanic mean travel costs (Bowker & Leeworthy, 1998, Loomis et al., 2001). Using the estimated price elasticities, the expected change in visitation with hypothetical fee levels was calculated as:

$$\% \Delta q_{ij} = \epsilon_{ij} * \% \Delta p_{ij}, \quad (5)$$

Where, $\% \Delta q_{ij}$ and $\% \Delta p_{ij}$ are the percentage changes in visitation and travel costs affected by entrance fee i for ethnicity j , respectively. Using the estimates of Hispanic price elasticity, the level of Hispanic visitation in the swsample was estimated for each fee level as:

$$\% \Delta q_{ij} \times V_j = \widehat{V}_{ij} \quad (6)$$

Where V_j is the current park visitation for ethnicity j and \widehat{V}_{ij} is the expected park visitation for ethnicity j assuming fee level i . The relative proportion of each group expected to continue visiting the parks as fees increase was calculated using:

$$\% \widehat{V}_{ij} = \widehat{V}_{ij} / \sum_{j=h}^{nh} \widehat{V}_{ij} \quad (7)$$

Examining these relative proportions for different fee levels provided a measurement of the diversity change in park visitation associated with variation in the entrance fee policy.

If increases in entrance fees result in similar increases in visitors' travel costs, there will be reductions in visitor consumer surplus (CS). This CS is often used to measure benefits (or social welfare) in benefit-cost analysis (Freeman, 2003). Its estimation can provide park management with policy-relevant information, particularly useful when making decisions that affect visitor benefits, such as programming expansions, facility improvements, and service reductions. Additionally, CS estimates provide an indication of the economic value users gain from access to the park, which, when aggregated across all users, can proxy market values for park resources. The average consumer surplus (CS) per trip for visitor groups was estimated as the negative inverse of the estimated travel cost estimates (Yen & Adamowicz, 1993).

$$CS = -1/\beta_{tc} \quad (8)$$

The adjusted Georgia state park visitation for hot spot and group size is presented in Table 2. The survey results represented 1,183,428 visits, which were adjusted based on the recreation hotspot sampling protocol (which excluded an estimated 20% of park visitors) and the approach outlined above to represent an estimated 164,825 visits by groups. These visits were divided into Hispanic and Non-Hispanic visitation using

sample proportions and reported mean visits for those groups. Since about 16.4% of groups were Hispanic, the total adjusted Hispanic group visitation was estimated to be 26,702 across the three surveyed parks in 2010. Thus, 83.6% of the adjusted 164,825 group visits involved non-Hispanic visitation. Using these estimates and equations (6) and (7), we estimated the likely effects of fee increases on park visitation and used those visitation estimates to model the effect of fee increases on park revenue, visitor diversity, and visitor welfare.

Table 2

Adjusted Georgia State Park Visitation: May 2010-April 2011

<i>Parks</i>	<i>Individual visits^a</i>	<i>Hot spot adjustment</i>	<i>Group size adjustment</i>	<i>Average group size</i>	<i>Group visits</i>
Fort Mountain	130,601	0.568	0.7826	4.419	13,137
Fort Yargo	467,728	0.785	0.7170	4.289	61,380
Red Top Mountain	585,099	0.849	0.7383	4.191	87,509
Total	1,183,428	0.788	0.7547	4.219	164,825

^a2010-2011 Park visitation estimates provided by Georgia State Parks and Historical Sites Division (GASPHSD) (Terrell, personal communication).

Results

Table 3 presents the summary statistics of the data employed to estimate the TCM. Hispanic visitors took about three trips per year, while non-Hispanics (primarily White and Asian visitors) about four trips a year. The estimated travel cost was less for Hispanics (\$15.40) compared to non-Hispanics (\$16.40). Hispanic respondents were relatively younger and included a higher proportion of females. The average annual income for Hispanic and non-Hispanic community was vastly different. Moreover, the group size was also larger for Hispanic visitors. White and Asian visitors were found to utilize free day access more, compared to Hispanic visitors. Table 4 presents the estimated coefficients of TCM. Most of the estimates were found to be statistically significant with expected signs. The sign of the travel cost coefficient (*tcost*) was negative, which is consistent with economic theory suggesting consumption of normal goods declines as their price increases. This result indicated a downward sloping demand curve in price (*trip cost*) and quantity (*visits*) space.

Table 3

Descriptive Statistics of the Variables Used in TCM for Georgia State Park Visitor Sample

	Hispanic mean (n=249)	Hispanic min/max	Black mean (n=95)	Black min/max (n=944)	White/Asian mean	White/Asian min/max
trips	3.2	1/20	2.6	1/20	4.1	1/40
subsite (% yes)	30.7	0/1	27.7	0/1	27.5	0/1
tcost (\$)	15.4	5.3/55.2	15.8	6.7/45.2	16.4	5.3/55.2
income (\$1,000s)	35.5	12.5/112.5	54.7	12.5/112.5	59.9	12.5/112.5
age	33.8	18/74	41.3	18/77	41.1	18/77
Male (%)	52.1	0/1	60.9	0/1	61.0	0/1
grpsize	4.9	1/8	4.4	1/8	4.0	1/8
freeday (%)	14.5	0/1	14.7	0/1	16.7	0/1

Table 4

Estimated Parameter Coefficients from a Poisson Regression Predicting Visitation Frequency for Georgia State Park Visitors, Adjusted for Zero Truncation and Endogenous Stratification

<i>Variable</i>	<i>Coefficient</i>	<i>Standard error</i>
tcost	-0.0714**	0.0037
subsite	-0.0968*	0.0418
income	-0.0030**	0.0006
age	-0.0003	0.0014
male	-0.0884*	0.0362
grpsize	0.0094	0.0097
FM	0.2097**	0.0487
FY	0.2826**	0.0457
freeday	0.5628**	0.0408
hisp	-0.8197**	0.1226
black	-0.6521**	0.0913
hisp x tcost	0.0344**	0.0085
constant	0.5628**	0.0408
LL	-3856.9521	
LR	1470.4500	
Pseudo R2	0.1601	

** = significant at 0.01; * = significant at 0.05.

The negative and statistically significant estimate associated with the substitute sites (*subsite*) indicated groups who believed there were available substitutes for recreation at north Georgia state parks took fewer annual trips to the surveyed parks, all else being equal. This result suggests that the availability of substitute sites reduces demand. However, contrary to economic theory, the negative sign associated with the income variable (*income*) indicated that lower-income groups were more frequent park visitors. The parameter estimate for the binary gender variable (*male*) was negative, suggesting that males took fewer recreational trips to the parks, all else being equal. The variables (*age*) and (*grpsize*) were statistically insignificant. The coefficients of dummy variables representing Fort Mountain (*FM*) and Fort Yargo (*FY*) parks were positive and significant, indicating that visitors interviewed at those parks were more frequent park users than those interviewed at Red Top Mountain park. Similarly, as expected, results suggested that visitors took a greater number of trips to the parks on the free admission day.

Both binary variables representing ethnicity, *black* and *hispanic*, were statistically significant and negative, suggesting that trip demand for those visitor groups was autonomously lower than demand for non-Hispanic whites and Asians. The Hispanic-travel cost interaction term (*hispanic x tcost*) coefficient estimate was positive and statistically significant, indicating that the aggregate effect of travel costs on trip demand was reduced for Hispanic visitors. This result supported the proposition that Hispanics were less sensitive to travel costs than non-Hispanics.

Visitor Diversity, and Visitor Welfare and Expected Revenue

Tables 5 and 6 present the predicted proportions of Hispanic and non-Hispanic visitor groups at north Georgia state parks for a range of hypothetical fees. Elasticity with larger absolute values implies a greater price response. At current fee levels, Hispanic price elasticity was -0.57 and non-Hispanic -1.17, indicating that non-Hispanic visitors have a price-elastic response to the changing travel costs, but Hispanic visitors are less price responsive to the travel costs. As such, fee increases are expected to affect a greater decline in visitation by non-Hispanic groups. As the hypothetical fee level increased, the expected proportion of Hispanic groups increased slightly relative to non-Hispanics. The proportion of non-Hispanic visitors increases from 16.2% to 21.5% when the entry fee doubles from \$5 to \$10 per trip (Table 5).

Table 5

Elasticity and Relative Visitor Proportion among Georgia State Park Visitor at Different Entrance Fee Levels: Hispanics

$$(B_{tc} = -0.071; B_{htc} = -0.0344; \overline{TC}_{nh} = \$16.39; \overline{TC}_h = \$15.42; \widehat{CS} = \$5.5/trip)$$

Fee	% Fee Change	Elasticity	%ΔP	%ΔQ	\widehat{V}_i (Group)	Expected Revenue	Proportion (Group)	CS (Group)
5	0%	-0.57	0.0%	0.0%	26725	\$114,250	16.2%	\$722,300
6	20%	-0.61	6.5%	-3.9%	25672	\$131,698	16.7%	\$693,842
7	40%	-0.64	13.0%	-8.4%	24491	\$146,578	17.4%	\$661,918
8	60%	-0.68	19.5%	-13.3%	23181	\$158,561	18.4%	\$626,527
9	80%	-0.72	25.9%	-18.6%	21744	\$167,318	19.6%	\$587,670
10	100%	-0.76	32.4%	-24.5%	20178	\$172,520	21.5%	\$545,346

Table 6

Elasticity and Relative Visitor Proportion among Georgia State Park Visitor at Different Entrance Fee Lxlevels: non-Hispanics

$(B_{tc} = -0.071; B_{htc} = -0.0344; \overline{TC}_{nh} = \$16.39; \overline{TC}_h = \$15.42; \widehat{CS} = \$3.5/\text{trip})$

Fee	% Fee Change	Elasticity	% ΔP	% ΔQ	\widehat{V}_i (Group)	Expected Revenue	Proportion (Group)	CS (Group)
5	0%	-1.17	0.0%	0.0%	138,100	\$576,567	83.8%	\$1,934,172
6	20%	-1.24	6.1%	-7.6%	127,638	\$639,466	83.3%	\$1,787,646
7	40%	-1.31	12.2%	-16.0%	115,973	\$677,861	82.6%	\$1,624,269
8	60%	-1.38	18.3%	-25.3%	103,104	\$688,738	81.6%	\$1,444,040
9	80%	-1.45	24.4%	-35.5%	89,033	\$669,082	80.4%	\$1,246,959
10	100%	-1.53	30.5%	-46.6%	73,758	\$615,880	78.5%	\$1,033,026

Results from the TCM show that, overall, visitor price sensitivity is not expected to result in visitation declines that would offset revenue increase for modest fee hikes. For instance, small increases in entrance fees are expected to result in increased park revenue from \$690,817 (at \$5) to a maximum of \$847,299 (at \$8). The revenue-maximizing fee increase, as an integer, would be \$3 (Figure 2), but revenue differences between \$2 and \$4 fee hikes are practically the same. The overall expected park revenue starts declining noticeably if the entry fee is above \$9/trip. However, due primarily to differences in estimated price elasticities for Hispanic and non-Hispanic groups, the burden of covering this increased revenue would disproportionately affect Hispanic groups (Figure 2).

Based on the coefficient associated with the travel cost variable, CS values were estimated to be \$14/trip for non-Hispanic groups and \$27/trip for Hispanic visitors, or about \$3.5/trip for non-Hispanic individuals and \$5.5/trip for Hispanic individuals. Although Hispanics were estimated to derive higher amounts of CS than non-Hispanics because their visitation is expected to decline at a slower rate for under the fee hike scenarios, Hispanics would bear a larger share of the aggregate CS losses for each fee increase, all else being equal. Moreover, it's clear that while revenues increase slightly following small fee increases, there is a loss in aggregate consumer surplus to park visitors from \$2,656,472 (at \$5) to \$2,070,566 (at \$8), with more precipitous declines observed at higher fee values (Tables 5 and 6).

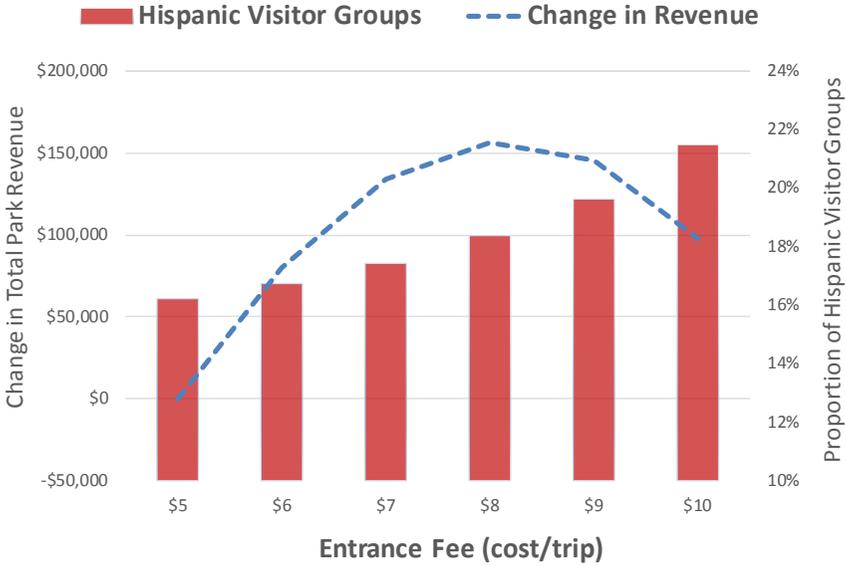


Figure 2. Projected changes in visitor diversity and total park revenue across all three Georgia State parks with increasing entry fees based on projections from travel cost model. Revenue generated rises from the current fee of \$5 and peaks at an entrance fee of \$8, when declining visitation begins to cut into additional revenue. However, as the proportion of Hispanic visitor groups increases under different fee scenarios, Hispanic visitors bear a greater burden of the costs associated with fee increases.

Discussion

Results of our TCM are generally consistent with economic theory (Varian, 2010) and previous research (Kyle et al., 2002; Schwartz & Lin, 2006), which suggests that park visitation (quantity demanded) decreases in response to a fee hike (price). By estimating changes in visitation and corresponding revenue generation (or loss) at various fee levels, we determined that across demographic groups a 40%-60% increase in entrance fees (from \$5 to \$7 or \$8) would increase revenue for these state parks in northern Georgia. At higher fee values (>\$10), declining visitation would offset any potential revenue generation. However, it is important to note that while revenues would grow initially, fee increases come with a significant loss in visitor welfare as measured by the difference in aggregate consumer surplus.

The effects of hypothetical fee hikes were not homogenous across different visitor groups. For example, the negative sign associated with the income variable (*income*) in our TCM runs contrary to economic theory. If recreation at these parks is a normal good, theory dictates that demand would increase with income. In our sample, however, the opposite occurred (albeit at a practically small level). This outcome is not uncommon in the recreation literature (Hesselyn et al., 2004; Rolfe & Dyack, 2010). One possible explanation is a greater diversity of recreation preferences leading to a larger variety of available substitutes for groups with higher incomes, as increased income may open up a number of recreation opportunities unavailable at these state parks. For

low-income visitors in northern Georgia, state parks might be one of the only recreation options for the array of goods/services these parks provide. Another possibility is a reduced amount of leisure time available for higher income households. In a meta-study of park visitor preferences, Doucouliagos and Hall (2010) found individuals with higher incomes more likely to cite the lack of available time as a limitation to park use. The negative relationship between park visitation and income also suggests that fee increases may be regressive in nature, as these results indicate that trip demand is higher for individuals of lower incomes. These low-income visitors would be expected to reduce trip frequency by a smaller proportion if park fees were to increase, causing them to bear a disproportionate share of the additional cost burden (Stevens, More, & Markowski-Lindsay, 2014).

Contrary to Bowker and Leeworthy (1998), who found Hispanics more price sensitive than non-Hispanics in their sample of Florida Keys visitors (-1.15 versus -0.30, respectively), we found that Hispanic state park visitors' recreation demand was more price inelastic than it was for other visitors. In other words, they were less price sensitive, resulting in higher proportions of Hispanic park visitors as the hypothetical entrance fee increased. Perhaps these different results could be attributed to heterogeneity within the Hispanic population (Hispanic visitors to the Florida Keys may be quite different than those in Georgia state parks) and/or trip length (unlike the Florida Keys, day use is the norm in Georgia state parks). Other studies have found that, compared to other groups, Hispanics in Georgia are more reliant on state parks than many other locations for physically active recreation (Larson et al., 2014). In any case, this relative increase in minority group visitation seems to indicate that fee hikes at these Georgia state parks might enhance the park systems' goal of serving diverse constituents, although it clearly comes at a loss in visitor welfare.

Since Hispanics and non-Hispanic visitors have different price elasticities, results also suggest that parks could possibly maximize their revenue at different fee levels for the two ethnic groups. For example, parks could collect maximum revenue of \$172,520 from Hispanic visitors when the fee level would increase from \$5 to \$10. However, a fee level of \$8 would generate maximum revenue (\$688,738) from non-Hispanic visitors. This dollar difference emerges because Hispanics visiting north Georgia state parks are less price responsive than other visitors. Park agencies often use information like this to develop pricing schemes to boost park visitation among particular groups (e.g., senior or veteran discounts; Crompton, 2015). However, though socially acceptable in some contexts, the ethical and legal ramifications of such policies should be scrutinized to avoid discrimination against marginalized groups (Scott, 2014).

Furthermore, it is important to reiterate that Hispanic state park visitors in our sample would also bear a disproportionate share of the additional cost burden, particularly as fees increase. While all of the group and individual consumer surplus values from our sample are within the ranges predicted in other outdoor recreation demand studies (Hesselyn et al., 2004; Hynes & Greene, 2013), it is clear that certain fee levels (e.g., those at \$8 or greater) lead to greater reductions in welfare even when revenue generation levels are similar. Additionally, as a result of decreased aggregate park visitation with fee increases, the tourism-related economic impacts that these parks provide to the economies in nearby communities could decrease substantially assuming per trip spending by groups remained roughly the same (Bowker, Bergstrom, & Gill, 2007; Fly et al., 2010). In short, as Kriesel and others (2005) have suggested, park managers'

dual goals of increasing financial sustainability and maximizing representation and benefits for diverse users may be fundamentally incompatible. However, as we show, there may be policy choices (fee levels) that lead to comparable revenue increases with substantively different losses in visitor welfare. These outcomes raise significance concerns about the (often inadvertent) ways in which institutional structures and policies impact social justice (Arai & Kivel, 2009), and they underscore the need for recreation and leisure research that exposes and examines these concerns (Stewart, 2014).

Limitations

Although the parks included in this sample were selected to be representative of north Georgia state parks, the generalizability of this study's results is limited by the non-random nature of the sampling frame. Sampling was limited to peak season at specific "recreation hotspots" within the parks. Larson (2012) estimated this sampling strategy excluded 20% of park users, however the true number is unknown. The behaviors and preferences of excluded visitors may not be represented in the sample if there is a segment of off-peak visitors who do not visit recreation hotspots during peak season. If these are significantly different from the visitors that were interviewed, analyses using this sample may be biased or at best only applicable to policies for peak season use. Care should therefore be taken in generalizing results outside of this sampling frame.

Our TCM used a pooled multisite model estimated in a single-site framework. To account for the potential inter-site heterogeneity, we used park-specific dummy variables (Larson, 2012; Loomis, 1989; Siderelis & Moore, 1995). Additionally, our model did not account for the opportunity costs associated with visitor travel time. Many studies assume time spent working may be traded for recreation time and use some fraction of hourly wages or household income as an opportunity cost proxy (Phaneuf & Smith, 2005). Others have challenged this approach, however, demonstrating that large proportions of recreationists are unable to earn income rather than recreate (Bowker & Leeworthy, 1998; Ovaskainen, Neuvonen & Pouta, 2012). Acknowledging the problematic nature of wage-based time costs, we estimated models without opportunity costs, resulting in lower bound (or conservative) estimates of visitor welfare loss from fee increases.

Failure to account for substitution behavior in a demand model specification will bias the own-price parameter toward zero, leading to more inelastic price response estimates and higher consumer surplus estimates (Freeman, 2003). Following Teasley, Bergstrom and Cordell (1994) and Bowker and Leeworthy (1998), we therefore controlled for visitors' substitution behavior with an indicator variable constructed from responses to a Likert-scale question that appeared in the survey instrument. This single proxy might not have been an adequate measure of substitution opportunities, however, and future research should take that possibility into account.

The structure of our sample did not allow us to adequately investigate the impacts of various fee increases of other racial/ethnic minority groups of park visitors (e.g., African Americans, Asians). Potential effects on these other groups should be taken into account in future analyses. Our visitor-centered onsite sampling and TCM approach also overlooked another important group that would likely be impacted by increased fees: non-users who might in fact be potential users. Perspectives of these non-users should also be integrated into frameworks that evaluated the benefits and costs of park

fee policies, including their impacts on surrounding communities (Fly et al., 2010; Loomis, 2003). Future research could also explore the reasons why certain populations might respond differently to park fees than others (Chung et al. 2011; Steckenreuter & Wolf, 2013).

Management Implications

Our study has many important management implications for park agencies that are (a) searching for ways to become more economically self-sufficient through onsite revenue generation and (b) committed to promoting visitor diversity and social welfare across diverse stakeholder groups. First, if recreation demand is inelastic (as it was in Georgia state park sample), small fee hikes (e.g., from \$5 to \$7 or \$8) can help to generate additional revenue for state parks facing financial constraints. However, these fee hikes come with costs, including overall declines in park visitation and consumer surplus. Additionally, fee hikes may not impact all visitor groups in the same way. We found that state park recreation demand was highest among lower-income visitors. We also found that, due to relatively more inelastic recreation demand, Hispanic visitors could be less price sensitive than other visitor groups. If so, as fees increase, both low-income and Hispanic visitors will comprise a larger proportion of the overall visitor population. While this might marginally enhance visitor diversity, it places a disproportionately high cost burden of these particular groups, reducing their welfare or general benefits. Our results highlight the potential social justice tradeoffs and unintended consequences that could emerge as managers attempt to address fiscal sustainability in state parks.

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