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Temporal Changes in Perceived Constraints to Visiting State Parks

John L. Crompton
Department of Recreation, Park and Tourism Sciences
Texas A&M University

Seong-Seop Kim
Department of Hotel and Tourism Management
Sejong University
South Korea

Two research questions guided the study: Do perceived constraints change over time among a sample of state park visitors? and, Do changes in the magnitude of constraints influence visitation to state parks? Three sets of data were analyzed. Data Sets 1 and 2 were independent samples of visitors to Texas state parks, while Data Set 3 consisted of a follow-up with respondents from Data Sets 1 and 2, 16 and 12 months later, respectively. Results indicated that perceived constraints on the Time Availability, Personal and Facility Constraints, and Weather dimensions did change significantly over these time periods. There was no significant change on the Cost dimension. However, no relationship was found between constraints and variations in visitation levels. Approximately half of the respondents reported relatively low perceived constraints and high visitation, but approximately one-quarter of those reporting high constraints on Time Availability also exhibited high visitation levels, suggesting they negotiated their way through the constraints.

KEYWORDS: *Perceived constraints; state park visitation, longitudinal design.*

Research investigating the influence of constraints on leisure participation has grown exponentially in the past two decades. The early premise for interest in this area of research stemmed from a belief that if perceived constraints could be removed or alleviated, then participation or visitation would increase. Such increases were perceived by suppliers of recreation services to be desirable because they would improve the efficiency of use of leisure resources by reducing spare capacity.

The prevailing assumption in the early constraints studies was that perceived constraints created insurmountable obstacles to participation. A corollary of that assumption was that people who participated in an activity were, by definition, unconstrained with respect to that activity. This naive view of constraints was eroded in the late 1980s and early 1990s. It was replaced by more insightful conceptualizations of constraints, and more diverse and sophisticated methods which strived to operationalize the richer conceptualizations (Jackson 1991).

Address correspondence to: John L. Crompton, Department of Recreation, Park and Tourism Sciences, Texas A&M University, College Station, TX 77843-2261, Phone: (979) 845-5320, Fax: (979) 845-0446.

In 1987, Crawford and Godbey proposed that in addition to "structural" constraints which inhibited participation in a preferred activity, there were other forms of constraints which they termed "intrapersonal" and "interpersonal." Intrapersonal constraints "involved individual states and attributes which interact with leisure preferences rather than intervening between preferences and participation" (p. 122). Examples of such constraints include stress, depression, religiosity, anxiety, perceived self-skills and prior socialization into specific leisure activities. Interpersonal constraints are "the result of interpersonal interaction or the relationship between individuals' characteristics" (p. 123). The most common example is the inability of an individual to locate a suitable partner with whom to engage in a particular activity. Structural constraints are "intervening factors between leisure preference and participation" (p. 123). These consist of the "barrier" items that had previously been the exclusive concern in leisure constraint studies. The three categories of constraints proposed by Crawford and Godbey (1987) were "nested" into a hierarchical model by Crawford, Jackson and Godbey (1991), and this was empirically verified by Raymore et al. (1993). Their hierarchical model proposed that leisure participants went through a sequential process of first negotiating intrapersonal constraints, then interpersonal constraints and, finally, structural constraints.

A similar conceptualization was suggested by Henderson, Stalnaker and Taylor (1988). Their terminology was somewhat different in that they did not differentiate between intrapersonal and interpersonal constraints but aggregated them under the heading of antecedent conditions. Similarly, they adopted the term intervening constraints, rather than structural constraints. Their exposition extended the conceptual interrelationships of the different forms of constraints by suggesting that the antecedent conditions could shape people's perceptions of intervening constraints.

The emergence of a richer conceptualization of constraints was accompanied by the reporting of empirical findings demonstrating constraints were not insurmountable barriers to leisure participation. Prominent among these studies were those by Kay and Jackson (1991), Willits and Willits (1986), Scott (1991), Shaw, Bonen, and McCabe (1991) and Norman (1995). Kay and Jackson (1991) reported that approximately one-third of respondents who perceived they were constrained by lack of money and lack of time, developed strategies to negotiate these constraints. Similar findings were reported by Shaw et al. (1991) who found that among those respondents who perceived themselves to be constrained by low energy, lack of self-discipline, injury or handicap, ill-health, or lack of skill there were low levels of participation; but there was a positive relationship between participation and other constraints (lack of time due to work or other leisure activities, no facilities nearby, high cost, inadequate facilities, unavailability of leaders). Norman (1995) reported that among his sample was a group who perceived a high level of constraints but, nevertheless, participated at a high level in vacation travel. He suggested this group was highly motivated which encouraged them to negotiate through the perceived constraints. More recently, Hubbard and Mannell (2001) developed and empirically examined four competing models

of leisure constraint negotiation which they termed, independence, buffer, mitigation and reduction.

These empirical findings suggested that rather than being viewed as insurmountable obstacles, constraints should be conceptualized as having a gradient of intensity and recognize "that instead of reacting passively to constraints on their leisure (i.e. by not participating), people negotiate through them and thus succeed in initiating or continuing leisure participation" (Jackson, Crawford and Godbey 1993, p. 2). Negotiation may involve such strategies as adjusting schedules; revising priorities in use of time, money, and energy; and becoming better informed. An elaboration of the role of negotiation was offered by Jackson et al. (1993) who formulated the proposition that, "Participation is dependent not on the absence of constraints (although this may be true for some people) but on negotiation through them. Such negotiations may modify rather than foreclose participation" (p. 4). They elaborated on this by developing five qualifying propositions which included, "Variations in the reporting of constraints can be viewed not only as variations in the experience of constraints but also as variations in success in negotiating them" (p. 6); and "Both the initiation and outcome of the negotiation process are dependent on the relative strength of, and interactions between, constraints on participating in an activity and motivations for such participation" (p. 9).

The notion that constraints can be negotiated appears to embrace Meyersohn's (1968) conceptualizations of "the less, the more" and "the more, the more" (Figure 1). Meyersohn investigated two competing hypotheses concerning the relationship between television viewing and the resources people had available. The first, which he termed "the less, the more" postulated that the less people had available to them, the more television they viewed. That is, the less fortunate members of society would watch more television than others. Meyersohn's alternative hypothesis was "the more the more" which postulated that "if an individual has the energy, interest, motivation and so forth to pursue one leisure activity, he is likely to be motivated to pursue others as well," suggesting "that interests in other leisure activities

Constraints	Participation Level: Low	Participation Level: High
Low	Group 1 The Less, The Less (no interest, no motivation)	Group 2 The Less, The More (traditional model)
High	Group 3 The More, The Less (traditional model)	Group 4 The More, The More (negotiation, overcoming constraints)

Figure 1. Matrix of Magnitude of Perceived Constraints and Participation Levels in State Park Visitation

might reinforce and stimulate interest in television" (p. 103). His empirical study concluded "that 'the more, the more' works when there is likely to be little in the way of leisure potential, 'the less, the more,' when there is likely to be much" (p. 111).

When adapted to the context of this study, Meyersohn's first postulate is consistent with the early thinking that low constraint levels lead to high participation and vice-versa (groups 2 and 3 in Figure 1), while the alternative postulate proposes that those who report high constraint levels may negotiate them away and report high participation levels because of their strong interest in the activity (group 4 in Figure 1). Figure 1 suggests that a third postulate "the less, the less" can be added to Meyersohn's original two (group 1). This recognizes that low levels of interest will lead to low levels of participation in an activity, even in cases where there is a perception of low constraints. Lack of interest leads people to assign the activity a low priority, so level of constraints becomes irrelevant.

Research Questions and Design

The analyses reported here were designed to address two research questions: (1) Do perceived constraints change over time? and, (2) Do changes in the magnitude of perceived constraints influence intensity of visitation to state parks?

The stability of constraints over time which is addressed in research question #1 has received relatively little attention in the literature, possibly because of the relative difficulty associated with collecting longitudinal data which such investigations require. The data used in this study were drawn from larger data sets that were designed to address multiple managerial issues facing the Texas Parks and Wildlife Department. The authors collected the data, but had limited input in formulating the questions that appeared on the questionnaires. One consequence of this limited role was that only structural constraint items were including in the survey questionnaires. From the perspective of this paper, it was particularly unfortunate that items measuring intrapersonal and interpersonal constraints were not included.

Research question #2 represents an initial attempt to empirically investigate the relationship between *changes* in perceived constraints and levels of participation/visitation. The adapted Meyersohn (1968) framework shown in Figure 1 was used to explore the extent to which park visitors appear to negotiate through perceived constraints.

Almost all constraints research has been cross-sectional and Jackson and Scott (1999) issue a *cri de coeur*: "researchers should strive to build longitudinal designs into their studies. Longitudinal data have been almost entirely absent in leisure constraints research but would help to determine whether the experience of leisure constraints is transitory or continuous over time" (p. 314). Longitudinal studies incorporate a repeated measurement design which collects data at different points in time (Parasuraman 1986) in contrast to cross-sectional studies which produce a "snapshot" of a situation at

one point in time. Parasuraman (1986) comments, "In general, longitudinal studies are more informative than cross-sectional studies" (p. 135).

Longitudinal data can be obtained either (i) from physically different, but representative, samples in a given population, or (ii) from the same sample, at different points in time. In this study, data were collected from the same sample of respondents at two points in time which Parasuraman (1986) suggests is likely to provide richer information than the strategy of using different representative samples. Two longitudinal studies have emerged in the constraints literature. Jackson and Witt (1994) used the former sampling strategy, while Wright, Rodgers and Backman (2001) adopted the latter strategy.

Jackson and Witt (1994) investigated the magnitude of change that occurred over a four year time period between different representative samples drawn from the Province of Alberta. Significant differences between the two samples were found on 5 of the 15 constraint items, but the authors characterized the numerical differences between the means as "minuscule" leading them to conclude: "The comparison showed very little temporal change—indeed a remarkable degree of similarity—in aspects of leisure constraints" (p. 334).

Wright et al.'s (2001) study of hunters was a repeated measures design surveying the same sample of respondents at a three-year interval. One of the study's goals was to assess the temporal stability of perceived constraints' factor structure and of their intensity. While the structure of their set of perceived constraints remained stable over the three year period, the constraints' intensity varied significantly on four of the study's five dimensions and the level of variation differed among participation groups.

The temporal nature of constraints was also investigated by Mannell and Zuzanck (1991) whose context was the "ebb and flow of daily life" (p. 338). They concluded: "Support was found for the contention that factors perceived to inhibit participation are variable and temporary in their influence. In fact, there was clear evidence that the respondents "switched constraints' across behavioral contexts" (p. 348).

Data Collection

Data were obtained from three different samples. A modified Dillman (1978) approach was used to collect the data in each case. However, funding limitations required the three wave design with a reminder postcard be restricted to two waves in the case of sample 3.

The first sample was drawn during the early summer of 1996 from visitors to nine different Texas state parks. Prospective respondents were selected at each park on a systematic basis (i.e., every *n*th person was selected, the *n* depending on the rate at which traffic was entering the park). The selected visitors were asked for their names and addresses; were personally handed a questionnaire as they entered the park; and were asked to return it in a prepaid envelope that was provided. The questionnaire distribution

was undertaken during two weekends in May, 1996. Two days later a reminder postcard was sent to each visitor. If a response had still not been received, second and third mailings of the questionnaire were sent two and four weeks, respectively, after the original questionnaires had been given out. The cover letters included announcement of an incentive in that each returned questionnaire was entered in a drawing to win one of five free Gold Texas Conservation Passports ($50 value) which allowed vehicular entry to Texas state parks and wildlife management areas for one year. A total of 2,416 questionnaires were distributed and 1,610 (67%) were returned. Over 45% of respondents reported annual household incomes of $50,000 or more, while 17% indicated their household incomes were less than $25,000. The gender ratio was 45% female, 55% male. Over 80% of respondents were aged between 25 and 54. They were overwhelmingly Anglo/white (86%) and 74% had completed one or more years of college.

The second set of data was collected from a different sample in the fall of 1996. The sample comprised 2,964 individuals who had responded to a survey of Texas state park visitors that was undertaken for another purpose two years previously. The first mailing of questionnaires was in September 1996. There were 390 in the sample who could not be located because they had changed their addresses. A reminder postcard was sent one week after the initial mailing. Two follow-up mailings were sent out to non-respondents two weeks and four weeks after the first wave. The overall response rate was 56% from an effective sample size of 2,574 (2,964-390). Among this sample, 46% of respondents reported their annual household income to be over $50,000, while 14% indicated a figure of less than $25,000. Some 58% were aged between 35 and 54, with another 24% over 55. Gender and ethnicity data were not collected.

A third survey was conducted in September 1997. This survey selected samples from Data Set 1 and 2 described above. A sample of 806 was selected from the 1,610 respondents in Data Set 1. The 806 cases were systematically selected with 50 percent equal proportional allocation from each of the nine Texas state parks from which Data Set 1 was derived. The decision to use only one-half of these potential respondents was dictated by the project's budget constraints. The second sample comprising Data Set 3 was derived from 966 of the respondents in Data Set 2. The 966 reflected those among the 1,440 respondents to Data Set 2 who answered a question asking their reaction to the price of admission at the state park they were visiting on a 5 point scale varying from "Much too low" to "Much too high." This criterion was chosen because the agency commissioning the study wanted to compare respondents' reactions to admission price over time. All who responded to that question were included in this second sample comprising Data Set 3. Thus, the total size of the Data Set 3 sample was 1,772 (806 + 966). Preliminary notification postcards were sent, followed by the survey, and a subsequent second wave. Again an incentive of a draw for five free Gold Texas Conservation Passports was offered to those who returned questionnaires. The final response for this sample was 55% (n = 880) out of an effective

sample size of 1,606 after 166 undeliverable mailings were deleted. Socio-demographic data were not requested from this sample.

A core set of eleven constraint items was used in all three surveys. The items were selected based on a review of the constraints literature (Backman & Crompton, 1989; Henderson, Stalnaker & Taylor, 1988; Jackson & Dunn, 1991; Jackson & Witt, 1994; Raymore, Godbey & Crawford, 1994; Shaw et al., 1991; Tian, Crompton & Witt, 1996; Wright & Goodale, 1991). In Data Set 1 and 2, the rubric preceding the constraints items asked: Will the following factors reduce the number of visits you make to Texas state parks during the next 12 months? Each question was followed by a 5-point scale (Definitely Yes = 5, Probably Yes = 4, Not Sure = 3, Probably No = 2, Definitely No = 1). The questions pertaining to intention to visit during the next 12 months asked: "About how many more day trips (not overnight stays) will you make to Texas state parks during the next 12 months? Do not count days spent on this trip;" and "About how many more overnight trips (not day trips) to Texas state parks will you make during the next 12 months? Do not count nights spent on this trip." These two questions were open-ended allowing respondents to record their anticipated number of total days and total nights.

In Data Sets 2 and 3, three items relating to weather or water levels were added to the core set of 11 items. The 14 items in Data Set 3 were designed to ask about constraints to visits to Texas state parks in the last 12 months. The question was: "Did the following factors reduce the number of visits you made to Texas state parks during the last 12 months?" The scale measures were the same as those in the first two Data sets. The two questions relating to number of past visitations within the last 12 months were: "About how many days did you spend in Texas state parks on day visits (no overnight stays) in the last 12 months?" and "About how many nights did you spend in Texas state parks on overnight visits in the last 12 months?" These questions were open-ended.

A major challenge and limitation of a repeated measure design, such as that used in this study, is mortality bias that accrues from attrition (Wright et al. 2001). The number of people from the original sample who respond, tends to markedly decrease in subsequent contacts with the sample. The number of respondents in Data Set 3 was 880, comprised of 295 from Data Set 1 and 585 from Data Set 2. The genesis of the 295 respondents from Data Set 1 was as follows:

Data Set 1:	Total Sample	2416
	Responses	1610
Data Set 3:	Sample Frame	1610
	Selected Sample	806
	Responses	295

Thus, the respondents in Data Set 3 represented only 12.2% of those in the original sample. A similar pattern emerged when the genesis of the 585 respondents derived from Data Set 2 was traced, but this involved three rather than two iterations.

Summer 1994:	Total Sample of Park Visitors	4968
	Responses	2964
Data Set 2:	Sample Frame	2964
	Selected Sample	1440
	Responses	966
Data Set 3:	Total Sample	966
	Responses	585

This group of Data Set 3 respondents comprised only 11.8% of the probability sample of park users that was chosen for the first wave of the three iteration panel study (although only the last two waves were relevant to the study reported here).

In both of these cases, part of the sample attrition was self-inflicted by the researchers disqualifying some members by not selecting them, rather than from non-response. Nevertheless, there is an obvious issue of whether the characteristics of the perceived constraints of those who persevere to the end of a repeated measures study are different from those who drop out. There is no obvious guideline as to how long the time interval between measures should be. Clearly, there is a trade-off between the time period being long enough for it to be reasonable to expect perceived constraints to change, and a longer time interval making it likely there will be increased attrition among the sample.

Results

The first stage of data analysis was to identify the dimensionality and internal consistency of the items used to measure the perceived constraint dimensions. This was done by undertaking a principal component factor analysis with varimax rotation on each of the three sets of responses to the constraint items, and by using Cronbach's alpha to assess internal consistency. Table 1 reports the loadings and reliability alphas for the 11 constraint items in Data Set 1. Four factors were identified and they were named: Time Availability; Cost; Facility Constraints; and Personal Constraints. The four factors accounted for 66.7% of the variance. The KMO of .70 confirmed that the factor model was acceptable, and the item loadings were acceptably high. Two of the Cronbach alphas were .62 and .60 which is relatively low. However, their low value was probably at least partially attributable to the small number of items in the dimensions and Cortina (1993) suggested that for scales with few items a minimum criterion of .60 was acceptable. Indeed, it has been suggested that for scales with only two items, such as the Personal Constraints dimension in Table 1, an alpha coefficient of .50 is acceptable (Nunnally & Bernstein, 1994).

Results on the remaining two data sets are reported in Table 2. The KMO values of .74 and .78 confirmed that the factor models in the two data sets were acceptable. The items loaded similarly to those in Table 1, with the notable exception of the Personal and Facility Constraints dimensions. They were independent on Table 1, but emerged as a single dimension in Table

TABLE 1
Results of Principal Component Factor Analysis with Varimax Rotation on the Constraint Scale Items in Data Set 1

Items	Factor Loadings 1	2	3	4	Communalities
Time Availability Dimension					
Too busy with other activities	.83				.69
Lack of time	.82				.67
Too busy with family responsibilities	.80				.64
Cost Dimension					
Cost of camping fees is too high		.90			.85
Cost of admission is too high		.90			.84
Cost of traveling to state parks is too high		.44			.69
Facility Constraints Dimension					
Poor quality of facilities in state parks			.81		.68
Fear of crime			.82		.69
State parks are too crowded			.51		.37
Personal Constraints Dimension					
Difficult to get to state parks				.86	.74
Poor health				.45	.38
KMO (Kaiser-Meyer-Olkin)		.70			
Eigenvalue	2.87	2.10	1.31	1.05	
Variance Explained	26.1	19.1	11.9	9.6	
Reliability Alphas for Each Dimension	.76	.78	.62	.60	
Total Scale Reliability Alpha		.64			
Grand Mean	3.76	2.31	2.25	1.65	

2. This merged dimension had the lowest Cronbach alpha, reflecting the patterns exhibited in Table 1. Although there were occasional anomalous loadings, communality, and alpha scores, generally the independent analyses of the constraint dimensions on the three data sets displayed an encouraging level of stability and consistency.

Research Question 1: Do Constraints Change Over Time?

The frequency counts reported in Table 3 indicate that among both Data Set 1 and Data Set 2 respondents, a large majority reported changes in their perceived constraints in Data Set 3. A substantially higher proportion of respondents perceived greater constraint of Time Availability over the period of the study than perceived a reduced constraint. However, on all the other dimensions the proportions were reversed, with more reporting a decrease than an increase in constraints. The patterns of respondents from Data Sets

TABLE 2

Results of Principal Component Factor Analyses with Varimax Rotation on the Constraint Scale Items in Data Sets 2 and 3

	Data Set 2					*Data Set 3*				
	Factor Loadings					Factor Loadings				
Items	1	2	3	4	Communalities	1	2	3	4	Communalities
Personal and Facility Constraints Dimension										
Fear of crime	.71				.50	.70				.51
Poor quality of facilities in state parks	.66				.49	.69				.50
State parks are too crowded	.42				.29	.43				.32
Difficult to get to state parks	.57				.39	.63				.42
Poor health	.61				.49	.34				.51
Time Availability Dimension										
Lack of time		.82			.70		.84			.71
Too busy with family responsibilities		.82			.69		.80			.65
Too busy with other activities		.83			.71		.79			.65
Weather Conditions and Consequences Dimension										
Dry weather conditions			.83		.71			.80		.69
Low water levels in streams/lakes			.76		.60			.72		.57
Hot weather conditions			.78		.65			.77		.62
Cost Dimension										
Cost of camping fees is too high				.88	.85				.72	.77
Cost of admission is too high				.89	.85				.70	.76
Cost of traveling to state parks is too high				.30	.45				.32	.51
KMO (Kaiser-Meyer-Olkin)			.74					.78		
Eigenvalue	3.19	2.56	1.45	1.16		3.29	2.53	1.35	1.02	
Variance Explained	24.0	19.6	11.1	8.2		24.0	20.2	10.0	8.0	
Reliability Alphas for Each Dimension	.66	.80	.73	.76		.54	.78	.67	.77	
Total Scale Reliability Alpha			.71					.70		
Grand Mean	1.97	3.71	2.45	2.38		1.97	3.95	2.10	2.22	

TABLE 3

Respondents Who Perceived a Decrease, No Change, and an Increase in Their Constraints over the Time Periods of the Study

	Data set 1—Data set 3 ($N = 274$) (16 months)			Data set 2—Data set 3 ($N = 547$) (12 months)		
	Decrease	No Change	Increase	Decrease	No Change	Increase
Personal and Facility Constraints	53%	13%	34%	53%	16%	31%
Time Availability	29%	18%	53%	28%	19%	53%
Cost	40%	22%	38%	45%	25%	30%
Weather	—	—	—	53%	23%	24%

1 and 2 were similar, suggesting that differences attributable to different time periods (12 months and 16 months) over which the changes were measured were not substantial.

The General Linear Model with repeated measures is suggested as the appropriate technique to use when individuals are measured at two or more points in time (Tabachnick & Fidell 1996). There is convincing evidence in the literature that perceived constraints differ by gender (Henderson & Allen 1991; Henderson & Bialeschki 1991; Scott & Jackson 1996), by age (Freysinger 1999; Jackson & Witt 1994), and by income (Scott & Munson 1994; Jackson & Witt 1994). Hence, income, gender and age were treated as covariates in order to control for their effects on the constraints' dimensions. The comparisons of Data Sets 2 and 3 omitted the gender covariate because it was not included on both questionnaires. The results reported in Tables 4 and 5 generally confirmed the trends shown in the frequency counts showing

TABLE 4
Results of General Linear Models with Repeated Measures Evaluating Shifts in Perceived Constraints between Data Set 1 and Data Set 3 ($N = 295$)

	Sum of Square	d.f.	Mean Square	*F*-value	*P*-value
Effect of Time on the Time Availability Dimension					
Time (main effect)	4.48	1	4.48	7.40	.01
Covariate (Income)	2.40	1	2.40	3.97	.05
Covariate (Sex)	1.44	1	1.44	2.39	.12
Covariate (Age)	.01	1	.01	.01	.93
Error	158.57	262	.60		
Effect of Time on the Cost Dimension**					
Time (main effect)	.08	1	.08	.15	.70
Covariate (Income)	.57	1	.57	1.12	.29
Covariate (Sex)	.54	1	.54	1.06	.30
Covariate (Age)	.15	1	.15	.29	.59
Error	130.28	258	.51		
Effect of Time on the Personal and Facility Constraints Dimension***					
Time (main effect)	.85	1	.85	3.09	.08
Covariate (Income)	.27	1	.27	.99	.26
Covariate (Sex)	.05	1	.05	.17	.32
Covariate (Age)	.36	1	.36	1.30	.68
Error	70.46	1	.28		

*Means and Standard Deviation on the Time Availability dimension: Data set 1: 3.71 (1.06), Data set 3: 4.06 (.97)

**Means and Standard Deviation on the Cost dimension: Data set 1: 2.26 (1.05), Data set 3: 2.24 (1.09)

***Means and Standard Deviation on the Personal and Facility Constraints: Data set 1: 1.98 (.63), Data set 3: 1.78 (.60)

TABLE 5
Results of General Linear Models with Repeated Measures Evaluating Shifts in Perceived Constraints between Data Set 2 and Data Set 3 (N = 585)

	Sum of Square	d.f.	Mean Square	*F*-value	*P*-value
Effect of Time on the Time Availability Dimension*					
Time (main effect)	.04	1	.04	.06	.80
Covariate (Income)	.05	1	.05	.01	.93
Covariate (Age)	.84	1	.84	1.32	.25
Error	317.14	1	317.14		
Effect of Time on the Weather Dimension**					
Time (main effect)	2.33	1	2.33	4.37	.05
Covariate (Income)	.08	1	.08	.00	.99
Covariate (Age)	.01	1	.01	.02	.88
Error	287.53	1	287.53		
Effect of Time on the Cost Dimension***					
Time (main effect)	2.36	1	2.36	4.60	.03
Covariate (Income)	.49	1	.49	1.15	.29
Covariate (Age)	.29	1	.29	.69	.41
Error	211.40	1	211.40		
Effect of Time on the Personal and Facility Constraints Dimension****					
Time (main effect)	2.21	1	2.21	7.99	.00
Covariate (Income)	.14	1	.14	.49	.48
Covariate (Age)	1.14	1	1.14	4.13	.04
Error	136.61	1	136.61		

*Means and Standard Deviation on the Time Availability dimension: Data set 2: 3.67(1.12), Data set 3: 3.95 (1.12)

**Means and Standard Deviation on the Weather dimension: Data set 2: 2.47 (1.03), Data set 3: 2.11 (.99)

***Means and Standard Deviation on the Cost dimension: Data set 2: 2.33 (1.03), Data set 3: 2.19 (1.04)

****Means and Standard Deviation on the Personal and Facility Constraints dimension: Data set 2: 1.95 (.63), Data set 3: 1.79(.65)

a consistent significant decrease in perceived constraints between Data Sets 1 and 2, and Data Set 3. The only exception in Table 4 was on the Time Availability dimension where there was a significant increase in both samples. A covariance effect was found only on income on the Time Availability dimension.

The results in Table 5 show significant differences on the three non-time related dimensions. Covariance influence emerged only on age in the Personal and Facility Constraints Dimension.

Visitors to Texas state parks were required either to pay an admission price each time they visited a park, or to purchase a Texas Conservation

Passport (TCP) which is an annual pass that authorizes free admission to all individuals in a vehicle. On May 1, 1996, substantive changes were enacted in the way that Texas state parks charged for admission. The cost of an annual vehicle pass was doubled from $25 to $50. However, the major shift was in the day visit fee which was changed from a per-vehicle to a per-person admission price. The per-person prices varied across parks, but most of them were either $2 or $3. These represented a substantial increase over the previous per-vehicle fees if there were more than two people in a vehicle. They pertained to campers as well as to day visitors, and thus impacted two of the three items which comprised the Cost dimension measure.

The per-person payers and annual pass groups were analyzed independently to see if they exhibited different constraint patterns. In undertaking these analyses a number of cases were lost, because some respondents changed their status between the two time periods. That is, some who were TCP holders at the time of the first survey had reverted to being per-person visitors at the time of the second survey, and vice-versa. It was anticipated that consistent with pricing theory, the impact of the price increases would dissipate over time (Crompton & Lamb, 1986). This effect was expected to be most prominent among those who paid the per-person price. However, the data in Tables 6 and 7 do not show this trend. This resistance to change of the Cost dimension over time among those who paid the per-person price was not expected. The results of these analyses shown in Tables 6 and 7 generally reflected the aggregate sample patterns shown in Tables 4 and 5.

Research Question 2: Do Changes in the Magnitude of Constraints Influence Intensity of Visitation?

A traditional underlying premise for investing effort into identifying constraints is that if they are perceived to decrease or increase over time, then there will be a commensurate increase or decrease, respectively, in visitation or participation. The proportions of respondents reporting changes in the magnitude of constraints were summarized in Table 3. Table 8 reports the proportion of respondents who indicated changes in the number of visitation days in the proceeding 12 months. Only 29% and 25% from Data Sets 1 and 2, respectively, reported little or no change in the number of days they visited state parks in Data Set 3. Most respondents reported decreases, while 26% and 20% from the two samples reported increases.

Regression analyses were undertaken on variables in the three data sets to ascertain the extent to which the constraint dimensions explained variations in visitation levels. In models of variables in Data Sets 1, 2, and 3, the total explained variances were 7%, 3%, and 4%, respectively. Thus, it was concluded that the constraint dimensions were not useful in explaining variation in visitation. In order to verify these results and use the longitudinal data to seek additional insights, a set of chi-square tests were undertaken which cross-tabulated the changes in visitation data shown in Table 8 with each constraint dimension using the data reported in Table 3. None of the

TABLE 6
Results of General Linear Models with Repeated Measures Evaluating Shifts in Perceived Constraints between Data Set 1 and Data Set 3 among Those Who Paid Per-Person Price (N = 120)

	Sum of Square	d.f.	Mean Square	*F*-value	*P*-value
Effect of Time on the Time Availability Dimension*					
Time (main effect)	2.38	1	2.38	4.80	.03
Covariate (Income)	1.20	1	1.20	2.42	.12
Covariate (Sex)	.38	1	.38	.76	.39
Covariate (Age)	.04	1	.04	.01	.93
Error	57.56	116	57.56		
Effect of Time on the Cost Dimension**					
Time (main effect)	.38	1	.38	.77	.38
Covariate (Income)	.54	1	.54	1.09	.30
Covariate (Sex)	.02	1	.02	.00	.95
Covariate (Age)	2.32	1	2.32	4.69	.03
Error	57.31	116	.49		
Effect of Time on the Personal and Facility Constraints Dimension***					
Time (main effect)	1.04	1	1.04	3.93	.05
Covariate (Income)	.05	1	.05	.02	.89
Covariate (Sex)	.09	1	.09	.32	.57
Covariate (Age)	.19	1	.19	.71	.40
Error	30.28	1	.27		

*Means and Standard Deviation on the Time Availability dimension: Data set 1: 3.83 (.98), Data set 3: 4.14 (.88)

**Means and Standard Deviation on the Cost dimension: Data set 1: 2.44 (1.11), Data set 3: 2.51 (1.12)

***Means and Standard Deviation on the Personal and Facility Constraints: Data set 1: 2.04 (.59), Data set 3: 1.83 (.63)

seven chi-square tests indicated a significant relationship between changes over time in perceived constraints and changes in annual number of state park visits over the same time period.

Respondents were classified into each of the four categories shown in Figure 1, on the basis of strength of constraints and number of day and overnight visits. The results are reported in Table 9. Strong and weak perceived constraints were operationalized as those who responded "probably yes" (4) or "definitely yes" (5) to the influence of constraints on reducing visitation, and those who responded in the other three categories, respectively. Number of low and high day or overnight visits was operationalized as those reporting 5 and below and 6 and above for day visits; and 4 and below and 5 and above for overnight visits.

Table 9 shows approximately one-half of the sample were classified into either group 2 "the less, the more" or group 3 "the more, the less." On

TABLE 7
Results of General Linear Models with Repeated Measures Evaluating Shifts in Perceived Constraints between Data Set 2 and Data Set 3 among Those Who Paid Per-Person Price (N = 218)

	Sum of Square	d.f.	Mean Square	*F*-value	*P*-value
Effect of Time on the Time Availability Dimension*					
Time (main effect)	2.69	1	2.69	5.01	.02
Covariate (Income)	.07	1	.07	.00	.97
Covariate (Age)	.14	1	.14	.27	.60
Error	99.09	1			
Effect of Time on the Weather Dimension**					
Time (main effect)	6.40	1	6.40	13.05	.00
Covariate (Income)	.63	1	.63	1.24	.27
Covariate (Age)	.09	1	.09	.17	.68
Error	97.86	1			
Effect of Time on the Cost Dimension***					
Time (main effect)	.64	1	.64	1.63	.20
Covariate (Income)	.02	1	.02	.06	.80
Covariate (Age)	.92	1	.92	2.35	.13
Error	76.97	1	76.97		
Effect of Time on the Personal and Facility Constraints Dimension****					
Time (main effect)	17.64	1	17.64	27.77	.00
Covariate (Income)	.06	1	.06	.02	.89
Covariate (Age)	.62	1	.62	1.80	.18
Error	56.34	1	56.34		

*Means and Standard Deviation on the Time Availability dimension: Data set 2: 3.81(1.00), Data set 3: 4.08 (.97)

**Means and Standard Deviation on the Weather dimension: Data set 2: 2.48 (1.02), Data set 3: 2.20 (1.00)

***Means and Standard Deviation on the Cost dimension: Data set 2: 2.40 (.97), Data set 3: 2.35 (1.00)

****Means and Standard Deviation on the Personal and Facility Constraints dimension: Data set 2: 2.01 (.66), Data set 3: 1.80 (.60)

TABLE 8
Changes in Annual Number of Visits to State Parks

Number of Changed Days	Data set 1 to Data set 3	Data set 2 to Data set 3
Decrease of 15 or more days	18%	22%
Decrease of 5-14 days	27%	33%
Decrease of 4 or fewer days and no change	29%	25%
Increase in days	26%	20%

TABLE 9

Percentage of Respondents in Each Data Set Assigned to the Four Cells of Figure 1 on Each Constraint Dimension

Data Set	Items	Day Visits				Overnight Visits			
		G1[1]	G2[2]	G3[3]	G4[4]	G1[1]	G2[2]	G3[3]	G4[4]
Date Set 1	Time Availability Dimension	19.6	24.8	30.8	24.8	21.1	22.7	30.7	25.5
	Cost Dimension	46.2	44.5	4.3	5.1	46.7	44.2	5.3	3.8
	Facility Constraints Dimension	48.3	46.9	2.1	2.7	49.5	45.4	2.5	2.7
	Personal Constraints Dimension	49.5	49.0	0.8	0.7	51.2	47.3	0.7	0.8
Data Set 2	Personal and Facility Constraints Dimension	50.0	48.8	0.4	0.8	51.3	47.6	0.7	0.5
	Time Availability Dimension	19.3	22.9	31.3	26.4	20.7	21.8	31.7	25.8
	Weather Conditions and Consequences Dimension	44.8	42.9	5.6	6.7	44.9	42.8	7.2	5.0
	Cost Dimension	44.9	44.0	5.8	5.3	46.7	42.1	5.9	5.3
Date Set 3	Personal and Facility Constraints Dimension	52.1	46.5	0.7	0.7	52.6	46.0	0.7	0.7
	Time Availability Dimension	16.4	17.9	36.8	28.9	17.4	17.0	36.6	29.1
	Weather Conditions and Consequences Dimension	50.0	44.6	2.8	2.6	50.2	44.4	3.3	2.0
	Cost Dimension	48.5	42.1	4.6	4.7	48.9	41.7	4.8	4.5

[1]G1: "the less, the less" group
[2]G2: "the less, the more" group
[3]G3: "the more, the less" group
[4]G4: "the more, the more" group

three of the constraint dimensions, almost all of the remaining respondents were classified into "the less, the less" category. Facility, Personal, Weather and Cost constraints were perceived to be low, but visitation was also infrequent. The Time Availability dimension was distinctive from the others in that between 25% and 29% of respondents from each data set perceived Time Availability to be a high constraint, but nevertheless reported high levels of visitation. These respondents were classified into "the more, the more" category.

Discussion

Factor analyses on the three data sets revealed consistent constraint dimensions both across different samples (Data Sets 1 and 2) and over time among the same respondents (Data Set 3). Grand means of three of the four constraints dimensions were relatively low. The grand means of the Personal and Facility Constraints dimension were less than 2 on the 5-point scale indicating they had "probably or definitely no" influence on park visitation (Tables 4 and 5). The Cost and Weather dimensions ranged from 2.11 to 2.47 placing them in the range from "not sure" to "probably no"indicating that they, too, were not perceived as meaningful constraining factors by a majority of respondents. The mean scores for the Time Availability dimension were quantumly higher, ranging from 3.71 to 4.06, meaning that time availability was perceived by most to be a substantive constraint to park visitation. The inhibiting influence of Time Availability may reflect the sample profile in that 80% of respondents reported their age to be between 25 and 54 in Data Set 1 and 74% in Data Set 2. This age group is likely to be most engaged with family and vocational commitments and is especially likely to be time poor.

The dominance of the Time Availability constraint dimension is consistent with extensive previous findings which were reviewed by Scott (1993) who described time scarcity as "one of the great problems facing Americans in the last 30 years—the feeling that one lacks enough time to do all the things that one would like to do" (p. 51). While no other studies appear to have been reported that investigated state park visitors' constraints, Scott and Jackson (1996) found in their analyses of perceived constraints towards urban park usage in the Cleveland Metroparks system that, "By far the most intense and widespread category of constraints consisted of those relating to the availability of time" (p. 9).

Although the levels of perceived constraints were relatively low, the study indicated that they did change significantly over the periods of 16 and 12 months during which respondents in this study were surveyed. Some of this change may have been attributable to lack of reliability of the instrument. Thus, for example, it is likely that when checking the scale items at two different time periods, some individuals recorded different responses on the scale even though their perception of constraint magnitude had not changed. However, it is reasonable to expect such reliability errors to be random and thus to be self-canceling.

The only constraint on which there was no shift over time among per visit payers was cost (Tables 6 and 7). Pricing theory suggests that the constraining influence of a substantial price increase, such as that which occurred in May 1996, should dissipate over time (Crompton & Lamb, 1986). However, there was no evidence that the constraining influence dissipated among members of this sample. This may be at least partially explained by some people viewing the price increase not as an issue about value for money or ability to pay, but rather as a matter of principle. A core number of park visitors appear to be opposed in principle to charging for admission to state parks (Harris & Driver, 1987, Stankey & Baden, 1977). They believe parks should be regarded as a public good and fully subsidized by tax funds. This may account for the resilience of the cost constraint among samples whose average household incomes in both Data Sets 1 and 2 were in the $35,000 to $49,999 cohort.

The regression and chi-square analyses relative to the second research question indicated there was no relationship between changes in constraints and changes in visitation. If this finding is supported by other studies, it may be explained in at least two ways, each of which becomes a proposition to be tested by future empirical work. It was noted earlier, that with the exception of Time Availability, all the dimension mean constraint scores were less than 3 on the 5 point scale suggesting perhaps that none of the other constraints were perceived to be strong enough to impact visitation decisions. These data suggest that for many people the non-time related structural constraint dimensions looked at in this study were relatively unimportant so that visitation decisions may be predominantly driven by perceived benefits. If the perceived benefits are greater than those offered by other leisure opportunities, then it seems reasonable to conject that individuals will visit parks irrespective of their perceived constraints.

If the constraints were not perceived to have reached a high enough threshold level to be constraining enough to influence visitation, then a fruitful direction for empirical inquiry may be to investigate how high is that threshold level. The appeal of this explanation would have been enhanced if some relationship had been found between Time Availability and visitation change because the scores on that dimension were relatively high, typically around 4.0 on the 5.0 scale. Alas, no such finding emerged as many individuals appeared to negotiate their way through this high level of constraint.

A second explanation may be that the magnitude of the change in constraints over time was too small to be sufficiently meaningful to lead to visitation changes. The changes were typically less than 10 percent. It may be that such shifts have to be much greater, say 25% or more, before they are sufficient to influence visitation shifts. Again, identifying that threshold level is a future empirical challenge.

Two additional reasons may contribute to explaining the low level of association between intensity of visitation and perceived constraints. First, only one interpersonal constraint item (fear of crime) and no intrapersonal constraints were included in the instrument. With that single exception, all

were structural constraint items. One of the limitations of using secondary data is that they may not address all the dimensions that subsequent investigators desire, and that occurred in this case. It was noted in the introduction section of this paper that there is widespread recognition that interpersonal and intrapersonal constraints play an important role in determining participation in an activity and their influence was not investigated in this study.

One half of the sample were classified into either "the more, the less" or "the less, the more" categories of Figure 1, consistent with the traditional belief that a perception of reduced constraints leads to increased visitation. However, given the generally low constraint scores, and the lack of support from the statistical analyses for any such relationship, it seems that these categorizations may be the outcome of higher motivations to visit rather than lower perceived constraints.

Approximately one-quarter of those reporting perceived high constraints on Time Availability were also classified as frequent visitors. These "the more, the more" respondents illustrated an ability to negotiate the strong constraints. Both "the less, the less" and "the more, the more" groups appear to confirm Jackson et al.'s (1993) notion that participation is "the product of a balance between constraints and motivation" (p. 10). In the former case, motivation was low, while among the latter group, it was high.

In addition to the specific results which have been reported, the study makes at least four other contributions to the literature. First, to the best of our knowledge, it is the first study to have focused on state parks. Indeed, given the centrality of parks to our field, the relative paucity of constraints studies relating to parks is surprising. Those of Scott and Munson (1994) and Scott and Jackson (1996) which both focused on urban parks in Cleveland appear to be rare examples. A second, and possibly related, contribution is the inclusion of a weather constraint dimension. This had good reliability, but it appears to have been ignored by most researchers. Third, we believe this is the first study to empirically investigate the relationship between changes in perceived constraints and levels of participation/visitation. It contributes to "the empirical verification" (p. 10) of the concept of constraints negotiation called for by Jackson et al. (1993).

Finally, we are aware of only two other studies that examined constraints using a repeated measures design (Jackson & Witt, 1994; Wright et al. 2001) and one of those used random samples drawn from the same population at two time periods, as opposed to using the same respondents at two time periods which was done in this study. The strength of a repeated measures study is the ability to examine the same respondents at different points in time (Babbie, 1998), and studies using this approach in the context of constraints have been strongly advocated by Jackson and Scott (1999).

The study has at least four limitations. First, it did not include non-users in the sampling frame. It was limited to analyzing the perceived constraints among people whose presence in the parks identified them as users. Second, like all studies in which respondents are selected on site, it is likely there was

some avidity bias in the sample. It has been demonstrated that the most avid park visitors, i.e. those who visit most frequently, are more likely to be selected for inclusion in on-site samples than less avid visitors, simply because their more frequent visitation makes them more available (Crompton 2001). This may at least partially account for the relatively large proportion of respondents who were classified into "the more, the more" cell on the Time Availability dimension.

Third, it was pointed out by one of the paper's reviewers that the two questions used to derive the data to address research question #1 ("Will the following factors reduce the number of visits you make to Texas state parks during the next 12 months" asked at time 1, and "Did the following factors reduce the number of visits you made to Texas state parks during the last 12 months" asked at time 2) may not necessarily have measured change in constraints over time. Rather, they may measure anticipated constraints versus actual constraints. The reviewer provided the following example: "At time 1 a respondent may have anticipated that dry weather would be a constraint. However, if it then rained for many days the weather would never have actually been a constraint. No negotiation is necessary, or even possible, to deal with dry weather since it never actually existed at the time a behavior was to occur. One question asks respondents to project into the future and the other asks them to relate actual experience."

Finally, it was noted earlier in the paper that sample mortality associated with the repeated measures design could have resulted in biasing the results of the perceived constraints characteristics if those who persevered to the end of the study were different from those who dropped out.

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