

EFFECT OF EXPERIENCE, EXPECTATION AND RESOURCE AVAILABILITY ON PERCEPTIONS OF CROWDING AMONG TROUT ANGLERS IN PENNSYLVANIA.

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Crowding research has suggested expectancy theory as one explanation to perceptions of crowding expressed by participants in outdoor recreation activities. Expectancy theory states that an individual enters into an activity with a preconceived set of expectations for the outcome of the experience. In this study, anglers fishing on the opening day of Pennsylvania's trout season were surveyed in an effort to determine if level of expected contacts influenced perceptions of crowding. Anglers were assigned to one of two groups, those with prior experience fishing the site on opening day and those new to the site for opening day. Mann-Whitney tests for two independent samples suggests prior experience does not play a role in explaining anglers' perceptions of crowding. A discussion of the importance of the temporal and situational dimensions of crowding research is also provided.

Introduction

Crowding has been one of the most frequently studied phenomena in outdoor recreation research (Manning 1985; Shelby et al. 1989). The psychological dimensions of crowding have been examined from the theoretical perspectives of expectancy (Shelby et al. 1983), discrepancy (Schreyer and Roggenbuck 1978) and normative behaviors (Gramann 1982). Schreyer and Roggenbuck (1978) proposed crowding research be conducted under the psychological domain of expectancy theory. Expectancy theory, as related to outdoor recreation by Schreyer and Roggenbuck, states that the recreationist has a predetermined set of expectations for an outdoor experience. Included in this set of expectations is the expected level of encounters with others while participating in the chosen activity. Crowding is then perceived to occur if the level of contacts experienced exceeds that which was expected.

The application of expectancy theory has been instrumental in separating crowding from reflections of density. Schreyer and Roggenbuck (1978) found expectations to be a significant factor in the subjective assessment of crowding by river floaters. In their study, expectations for the outcomes of the experience were examined concurrently with expectations for contact with others. Where the actual contacts exceed those expected, crowding was stated to occur. The level of perceived crowding differed by motivations and experience outcomes. Absher and Lee (1981) found experience motives to be a stronger predictor of crowding perceptions than actual density levels. Those backcountry users desiring solitude and shared experience with others in their group expressed the highest perceptions of crowding when contacts with others exceeded their level of expectation.

High levels of density may occur in an outdoor recreation setting, but the conditions may not necessarily be perceived as crowded by the participants due to their expectations for contacts. Graefe et al. (1986) found expectations for contact to be an indicator of perceived crowding than encounters with other visitors in backcountry settings, even when expectations for contacts were higher than the participant desired. This acceptance of higher density may be due to past experience with the site, thus providing the visitor with a reference from which to establish a

level of expected encounters with others (Vaske et al. 1980; Ditton et al. 1983).

Crowding perceptions may also be influenced by the preferences for the experience expressed by the recreationist. Shelby et al. (1983) reviewed six different studies related to crowding perceptions. While the studies were conducted with different activities, their analysis showed preference variables to be related to crowding perceptions for some activities, although preferences were not as strongly related to crowding perceptions as expectation variables. In some outdoor recreation activities (e.g., deer hunting), preferences may actually be for a higher density than for other activities. In these situations, preference may not be an adequate predictor of crowding.

The influence of social behavior has been effectively associated with perceptions of crowding (Gramann 1982; Manning 1985; Vaske et al. 1986; Williams et al. 1991). Under the theoretical domain of normative behavior, the social psychological aspect of crowding is related not so much to how many people are encountered as to the behavior of those encountered. Normative behavior theory implies that encounters with other recreationists are evaluated on the basis of the behavior exhibited by those encountered. These behaviors are evaluated and compared to a set of standard behaviors by the participant, and if the behaviors expressed by others is found in contrast to those deemed appropriate by the participant the situation may be determined as crowded.

An extensive review of thirty-six studies relating to crowding research was conducted by Shelby et al. (1989). Five hypotheses were proposed for this composite analysis. First, it was proposed that crowding perceptions would vary in a temporal dimension, either by time of use or by season. Second, crowding would be dependent on resource abundance or availability, with different perceptions of crowding expressed by consumptive vs. non-consumptive recreationists. Third, the researchers proposed crowding would differ by the level of access the recreationist felt was provided to the resources. Fourth, crowding was hypothesized to differ by type of use (i.e. consumptive versus nonconsumptive). Fifth, crowding was stated to be related to different management actions for the site.

Results of the review of the research studies by Shelby and others (1989) supported four of the five hypotheses. Only the fourth hypothesis, crowding differed by type of use was rejected as not significant. This review has several suggestions for the current study. First, crowding perceptions may differ by time or season of use. In the present study reported here, anglers fishing on the opening day of the season may report different levels of crowding than those surveyed at another point in the season. Second, the notion that crowding may differ by resource availability is an important point if anglers feel there are more fish available early in the season when stocking has recently occurred. Another aspect related to the present study is the role played by management actions in crowding perceptions. Stocking trout prior to an during the early portion of the trout fishing season is a management action that may influence the crowding perceptions expressed by the anglers involved.

Hypotheses

The present study deals with perceptions of crowding among trout anglers on the opening day of trout season in Pennsylvania. In order to examine the possible perceptions of crowding expressed by the participants in this study, four hypotheses are proposed.

- H₁: Perceptions of crowding are not related to past experience at site.
- H₂: Perceptions of crowding are not related to environmental conditions.
- H₃: Perceptions of crowding are independent of resource availability.

The first hypothesis addresses the application of expectancy theory in crowding research. The second hypothesis seeks to investigate possible interactions between perceptions of resource availability and crowding. The third hypothesis concerns the possible influence group membership may have on perceived crowding, while the fourth hypothesis addresses the theory of normative behavior and perceived crowding.

Methods

This study was originally intended to include three streams: Spring Creek (a no harvest stream), Logan Branch (a limited stocking, wild trout stream) and Bald Eagle Creek (high stocking stream). Heavy rains and flooding prior to the opening day of trout season prevented the use of these streams as study locations. As an alternative to the use of the streams for this study, a local lake was selected under the assumption that the weather would displace anglers from the streams and those wishing to fish on the opening day would seek out local lakes.

Description of Study Site

This study was conducted in Poe Valley State Park in Centre County, Pennsylvania. Located approximately 35 miles east of the town of State College, Poe Valley State Park offers boating and fishing on a thirty-five acre impoundment situated in a small valley on the top of Broad Mountain.

Sample Population

Data for this study were obtained through on-site interviews with anglers fishing at Poe Valley State Park on Pennsylvania's opening day of trout season (April 17, 1993). The opening day is typically one of high angler densities, and suitable for examining the relationship between expectations toward crowding and the realized experience. Each angler participating in the study was approached by the researcher and asked to complete a questionnaire. The survey instrument consisted of eighteen questions. Fourteen of the questions were of an ordinal, Likert-type of response, and four questions were continuous in nature as interval responses. Follow-up studies were attempted for two subsequent weekends, but were unsuccessful due to a low turn out of anglers on the following weekends. As a result of the low angler participation on the weekends following the opening day, data for this study were limited to the responses obtained from the opening day sample.

The purpose of this study was to measure the perception of crowding experienced by the anglers participating in opening day fishing activities. Two measures of crowding were used. The first measure asked the angler if there were more or less people than he or she had expected and used a five-point Likert scale ranging from much less than expected to much more than expected.

The second measure of perceptions of crowding involved the use of the nine-point Likert scale suggested by Vaske et al. (1980). This scale denotes positions one and two as "not crowded" and three through nine as "slightly crowded" to "very crowded," respectively. Anglers were also asked if the number of people present on this day different as "more," "same" or "less" from past years.

In addition to perception of crowding, questions examining the angler's resource orientation, fishing experience and level of participation were also asked. The final question asked for the number of fish that angler had caught thus far.

Results

Data Analysis

A total of 31 completed questionnaires were obtained through the opening day sample. The mean response for expectations of crowding was 3.0 or "about the same as expected," indicating the respondents evaluated the level of contact to meet with their expectations. The mean response for the nine-point crowding scale was crowding was 5.5, indicating the mean response to be interpreted as "crowded." Table 1 provides a summary of the means for selected variables in the questionnaire.

Table 1. Means and standard deviations for crowding variables by angler type.

New Anglers (N = 13)		
	<u>Mean</u>	<u>St.Dev.</u>
Expected Level of Contacts	3.7	0.78
Perceptions of Conditions	2.7	0.48
Perceptions of Crowding	5.7	2.06
Number of Fish Caught	1.0	0.92
Past Anglers (N = 18)		
	<u>Mean</u>	<u>St.Dev.</u>
Expected Level of Contacts	3.5	1.2
Perceptions of Conditions	2.5	0.7
Perceptions of Crowding	5.3	2.33
Number of Fish Caught	4	2.71

The responses were classified by those who had prior experience fishing the lake on opening day of trout season and those who were new visitors to the lake for the opening day. A Mann-Whitney test for two independent samples was conducted to determine if a difference in perceptions of crowding existed between the two groups (Table 2). Based on the results of the Mann-Whitney test, it was determined that no difference in perceptions of crowding exists between the two groups ($\alpha = .05$), thus hypothesis H1 is not rejected.

Table 2. Mann-Whitney confidence interval and test for perceptions of crowding.

New Anglers	N = 13	Median = 6.000
Past Anglers	N = 18	Median = 5.000
Point estimate for ETA1-ETA2 is -0.0000		
95.2 pct c.i. for ETA1-ETA2 is (-1.000,2.000)		
W = 216.0		
Test of ETA1 = ETA2 vs. ETA1 n.e. ETA2 is significant at 0.7640		
The test is significant at 0.7615 (adjusted for ties)		
Cannot reject at alpha = 0.05		

Past experience was used as an independent variable in comparison to perceptions of fishing conditions. A index of fishing conditions was derived from items asking about the quality of the fishing on that day, water conditions, and weather. Past users did not indicate a difference in perceptions of fishing conditions when compared with new anglers. Hypothesis H2, no difference in perceptions of fishing conditions exist between anglers with past experience and anglers with no site experience, cannot be rejected at $\alpha = .05$. The Mann-Whitney test for independence for perceptions of fishing conditions is presented in Table 3.

Table 3. Mann-Whitney confidence interval and test for perceptions of fishing conditions.

New Anglers	N = 13	Median = 3.0000
Past Anglers	N = 18	Median = 2.0000
Point estimate for ETA1-ETA2 is -0.0000		
95.2 pct c.i. for ETA1-ETA2 is (-0.0001,1.0000)		
W = 234.5		
Test of ETA1 = ETA2 vs. ETA1 n.e. ETA2 is significant at 0.2980		
The test is significant at 0.2431 (adjusted for ties)		
Cannot reject at alpha = 0.05		

The number of fish caught and competition from other anglers were used as indicators of the availability of the resource. New anglers caught significantly less fish than anglers with prior experience at the lake and were no as adept at locating prime locations for fishing. New anglers thus showed a significant difference from anglers with prior experience at the lake on opening day (Table 4). Hypothesis H3 states that perceptions of resource availability do not differ between new and past anglers, and cannot be rejected at $\alpha = .05$.

Table 4. Mann-Whitney confidence interval and test for resource availability.

New Anglers	N = 13	Median = 1.000
Past Anglers	N = 18	Median = 4.000

Point estimate for ETA1-ETA2 is -3.000

95.2 pct c.i. for ETA1-ETA2 is (-4.001,-1.000)

W = 135.0

Test of ETA1 = ETA2 vs. ETA1 n.e. ETA2 is significant at 0.0037

The test is significant at 0.0032 (adjusted for ties)

Discussion

The results of this study lend support for the relationship between expected level of contacts and perceptions of crowding. The failure to reject hypothesis H1, that no difference exists between new and past anglers in perceptions of crowding, indicates that expectations of crowding conditions were no different for anglers who have fished the lake on opening day than for anglers new to the lake on opening day. It can be interpreted that the expectations for fishing conditions in terms of angler density was anticipated by both groups, and thus neither group showed a tendency to indicate that the lake was crowded.

The second hypothesis, perceptions of crowding are not related to environmental conditions, was not rejected. In this case the anglers present did not view the presence of other anglers as a negative influence on the fishing conditions of the lake. It may be argued that expectations for weather and water conditions were also a factor in determining the anglers' subjective evaluations of the fishing conditions, and thus the anglers did not view the conditions negatively.

The third hypothesis, that crowding is related to resource availability, was supported and the null hypothesis H3 was rejected. In this study the respondents did not feel crowded conditions contributed to competition for the trout available. Crowding was expressed evenly by those who had caught trout and those who had not. Perhaps the access to the lake shore had an effect on the relationship between perceptions of crowding and resource availability. The anglers in this study had ample room in terms of access to the lake shore for fishing. Had conditions been such that this access was denied, perhaps a possible relationship between the variables for resource availability and perceptions of crowding would have been more apparent.

Conclusions

The results of this study support the application of expectancy theory in crowding research. More attention is needed to the factors which contribute to the development of expectations for level of encounters. Further studies are needed to examine the importance of the temporal dimension in crowding research. Consumptive activities (i.e. hunting and fishing) are regulated by law to have specific starting and ending dates. By having such starting and ending periods, expectations and level of participation may be influenced by the seasonal aspect of these activities. As this study attempted to investigate crowding perceptions on the opening day of trout season, so might further research examine the possible changes in expectation from the opening day of the fishing season across other user days throughout the fishing season.

Further research could also investigate perceived crowding following periods of high resource availability, for example following the stocking of trout in certain streams. The dimension of competition for available resources could effect the perceptions of crowding on the part of the participants. Those participants harvesting game or fish may view crowding conditions differently from those not filling their bags or creels.

In conclusion, it must be stated that the results of this study must be viewed with some degree of caution. Larger sample sizes should be employed. The study presented here used a small sample from only one location at one particular period of time. Further research could expand on this study to note perceptions of crowding at similar sites on the opening day of fishing season, as well as differences between lakes and streams. Comparisons between lakes and streams would allow for the examination of the possible influence of environmental conditions on perceived crowding.

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