

A REASSESSMENT OF THE ANGLER

SPECIALIZATION CONCEPT

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The angler specialization concept was reviewed and compared to other theoretical frameworks that are more based in multi-determinate behavioral approaches and cognitive processes. Personal investment theory and expectancy theory are suggested as more theoretically appropriate to measure angler specialization.

Introduction

Angler typologies have been proposed and evaluated since Plato noted in the *Sophist* that it is necessary to "come to an understanding not only about the name of the angler's art, but about the definition of the thing itself" (Hamilton and Cairns, 1961) to determine the angler's impact on the resource and upon society. The importance of those typologies to fishery and recreation management is partially based upon the resource considerations as well as the economic value that we place upon the angler's activities and travel-related expenditures.

For example, the reported positive economic impacts of sportfishing on New York's Great Lakes coastal communities emphasizes the need to maintain angler participation and satisfaction since it is important for fishery managers and coastal communities. More than 295,000 anglers fished 2.6 million angler days on New York's Lake Ontario waters in 1988 and they spent \$87.5 million in trip expenditures within the coastal areas (Connelly et al., 1990a). This participation was a dramatic increase in the number of anglers (490%) and angler effort (285%) for Lake Ontario from 1973 to 1988 (Connelly et al., 1990b). Angling participation in New York's Great Lakes waters is estimated to increase to the year 2000 (Dawson and Brown, 1990).

Sportfishery management in the Great Lakes will require an understanding of angler motivations and developmental maturation over time to anticipate angler behavioral reaction to various fishery management alternatives. Information on the motives and expectations of anglers can help fishery managers to determine which management alternatives will meet, redirect, or change angler expectations and motives (Dawson and Wilkins, 1980; Brown, 1987; Gale, 1987).

Angler Motivation and Specialization Theory

The concept of angling specialization to explain the formation of motives and the process of motivational change that leads an

angler to seek different species, settings, equipment, and experiences was proposed by Bryan (1976, 1977, and 1979). Bryan (1979) concluded that there were four basic types of freshwater anglers: (1) the occasional angler with novice ability and only casual interest in the sport; (2) the generalist angler who is interested in catching some fish in any environment by any legal method; (3) the tackle-species specialist who specializes in the skill of a particular angling method and/or angling for a particular species; and (4) the method-species-setting specialist who specializes in the method, species, and setting which make up a particular experience. These angler types are based on their degree of specialization in fishing and their specific motives in using the fishery resource. Anglers reportedly changed attitudes and motivations as specialization increased so that the emphasis shifted from consumption to conservation and natural settings. More specialized anglers were predicted to decrease interest in harvest motives and increase interest in non-harvest motives and specialized fishing equipment.

Several angler studies (Fedler and Ditton, 1986; Absher and Collins, 1987; Siemer et al., 1989; Steele et al., 1990) have reported general support for Bryan's (1979) concept that as anglers become more specialized "the fish are not so much the object as the experience of fishing is an end in itself." For example, boating anglers on Lakes Ontario and Michigan reportedly undergo a maturation or motivational change process over time toward more interest in fishing methods and technique, more interest in the management and conservation of fisheries, and stable or declining interest in the number of fish caught or harvested (Absher and Collins, 1987; Siemer et al., 1989).

Research on the Salmon River (Dawson and Brown, 1989; Connelly et al., 1990c) suggests that the normative concept of recreational specialization and sequential stages of development may not hold true for some segments of anglers. Connelly et al. (1990c) reported that 45 percent of steelhead anglers (highly specialized) also participated in salmon snagging/lifting activities (low specialization and focused on harvest more than skill) in 1989. Neither the researchers nor the fishery managers anticipated the magnitude of the overlap in the salmon snagging, salmon non-snagging, and steelhead angler segments due, in part, to the implicit acceptance of the recreational specialization concept.

The general acceptance of the recreational specialization concept in recreation and fishery management literature (Decker et al., 1987) appears to be its intuitive appeal to both researchers and managers. However, the concept has not been rigorously researched and evaluated via statistical tests in empirical studies on recreational or angler involvement and decision-making. Rather, the concept has been generally accepted and incidental evidence of its appropriateness offered ad hoc. Some re-evaluation of the specialization concept appears necessary to foster additional research. For example, Ditton et al. (1992) note that Bryan has essentially developed a tautology or circular path of logic whereby the specialization hierarchy is defined and measured by the same variables.

Theoretical Comparisons

Bryan's (1979) specialization concept is based on human needs (such as Maslow's hierarchy of needs) and reinforcement or social learning theory. The sequence of events begins with a motivation or stimulus which results in individual behavior and is followed by an intrinsic and extrinsic reward, and then at some interval a repeat of the same action or a similar action. The concept map (Figure 1) outlines the basic sequence of

events and illustrates the feedback or reinforcement loop that provides the behavioral modification necessary for continued involvement. Intrinsic rewards are related to the individuals own internal evaluation of his/her performance (e.g., satisfaction at catching a valued fish species in a

challenging situation and using specialized equipment). Extrinsic rewards are provided by the social group sharing the experience or observing the results of the performance (e.g., praise and social status within the peer fishing group based on an outstanding performance).

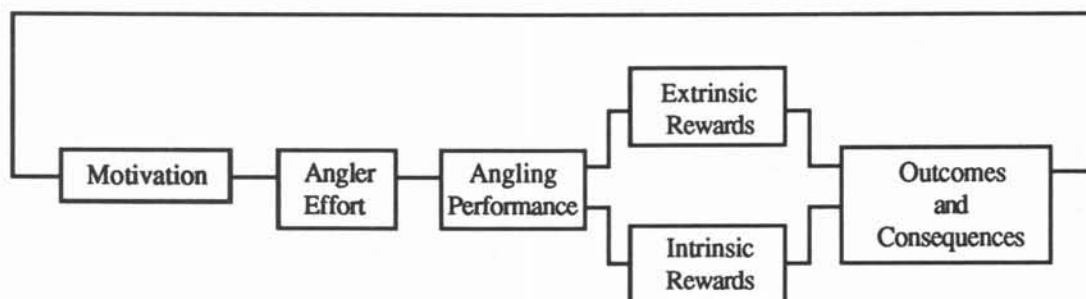


Figure 1. Reinforcement theory model of angler behavior and specialization (adapted from Bryan, 1979; Hamner et al., 1983).

The Recreation specialization concept is based on the human need theory and the reinforcement theory that behavior is closely associated with the positive and negative outcomes learned from past behavior. For example, Bryan (1979) acknowledges that the specialization concept is based on human needs theory such as Maslow's hierarchy of needs, although expressed in recreational specialization stages. The recreation specialization concept has some similar research dilemmas as reported for Maslow's hierarchy of need theory. Wahba and Bridwell (1983) note that the Maslow theory has received little clear or consistent support from available research findings due to the generalized nature of the theory (i.e., it is difficult to operationalize and interpret) and the rigidity of the theory that predicts a fixed hierarchy (i.e., how can a fixed hierarchy model predict behavior that the literature has described as multi-determinate?). Similarly, research questions have been raised about the validity of reinforcement models that consider behavior as determined by the consequences of past behavior and do not consider the cognitive domain in which an individual makes decisions about future behavior based on conscious and subconscious evaluations of actions and consequences (Hamner et al., 1983). More recent motivational research has focused on process models such as personal investment theory and expectancy theory.

A second motivational model that has been proposed by Absher and Collins (1987) for use with the recreational specialization concept is personal investment theory. The difficulties inherent in operationalizing the specialization concept were considered and partially resolved by Absher and Collins (1987) using Maehr and Braskamp's (1986) motivation domains in personal investment theory. The five domains or characteristics of motivation are listed by Absher and Collins (1987) as: (1) choice - selection from a set of potential actions or behaviors; (2) persistence - the tendency to choose and return to the same activity or set of activities over a given period of time; (3) continuing motivation - the tendency to return to the same activity or set of activities following some interruption in time; (4) performance - a skill level or perceived ability to perform a task or activity; and (5) intensity - the commitment level to an activity and its relative importance compared to other activities in life.

The personal investment theory and motivational domains were utilized by Absher and Collins (1987) to develop a three level specialization typology for analysis of anglers fishing on southern Lake Michigan. A specialization index score was

computed for each angler through five motivational domain subindices. Absher and Collins concluded that the resulting specialization index provided an angler typology that permitted discriminant analysis to be used to detect differences among the groups regarding management preferences and that the analysis was useful in evaluating potential management actions and regulations.

Siemer et al. (1989) conducted an analysis of the motivations of Lake Ontario boat anglers fishing for salmonids by using personal investment theory. The study reported using participation as a measure of investment and two motivation scales (i.e., motivation to participate in recreation, motivation to participate in salmon fishing) to compare the differences between two levels of personal investment. Siemer et al. (1989) reported "some evidence to support the notion that anglers undergo a process of motivation change or maturation over time involving increased importance on fishing methods and conservation/management of fisheries resources, and a stable or decreased interest in number of fish caught or kept."

A third motivational model that appears appropriate to apply in recreational settings is expectancy theory which includes cognitive processes as central to the behavior decision-making/involvement process experienced by recreationists and anglers. Cognitive theory approaches the motivation phenomenon from the perspective of expectancy whereby behavior is influenced by past outcomes but is more selective in anticipation and ascribing response-outcome probabilities than is reinforcement theory. Expectancy theory proposes that three variables are necessary to predict motivation: (1) Expectancy - the probability (ranges from 0 to 1) that an individual ascribes to his/her ability to perform a task successfully; (2) Instrumentality - the probability (ranges from -1 to +1) of attaining the desired outcome; and (3) Valence - the perceived desirability or value (ranges from -1 to +1) the individual places on the expected outcome or reward (Vroom, 1964; Nadler and Lawler, 1983). Motivation is multiplicative for these three variables so that each variable must have a relatively high positive value to provide the motivation for effort and activity. If, at any time, one or more of the variables approaches zero or turns negative, then the motivation to act will diminish correspondingly. A conceptual map of the expectancy theory model in Figure 2 illustrates the relationship of fishing motivation to performance and satisfaction.

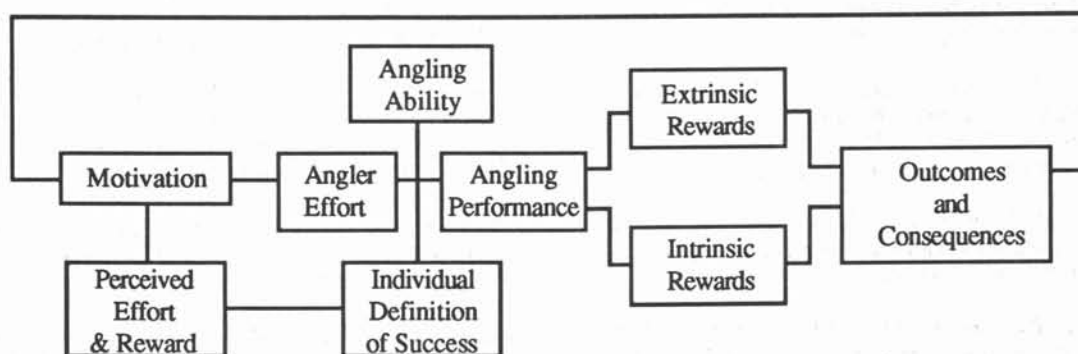


Figure 2. Expectancy theory model of angler behavior (adapted from Hamner et al., 1983; Landy & Trumbo, 1983; Nadler & Lawler, 1983).

Stating the expectancy model in recreational salmon fishing terms, if an angler believes he/she is able to successfully catch a salmon by a particular angling method and in a specific river setting, then a high expectancy value will be assigned. The angler who believes that catching a salmon (performance) leads to desired extrinsic (e.g., social recognition of achievement by peers) and intrinsic (e.g., sense of self-achievement) rewards will assign a high value to instrumentality. If the rewards are perceived by the angler to be of personal importance, then a high value will be assigned to valence. The multiplicative result of these three variables via the cognitive process outlined in expectancy theory is motivation.

Conclusions

The literature indicates little direct support for the fishing specialization concept. The parallel with Maslow's theory is important to understand because both have similar research implementation difficulties, as noted by Wahba and Bridwell (1983): "Maslow's Need Hierarchy Theory presents the student of work motivation with an interesting paradox: the theory is widely accepted, but there is little research evidence to support it." The theoretical improvements suggested herein are to assess the utility of adding cognitive dimensions to the fishing specialization concept to reflect the cognitive and multi-determinate behavior of anglers and to develop a more testable theory that addresses the conditions under which the concept is valid and reliable. For example, how does angler expectancy for success relate to specialization? Are the relationships in behavioral outcomes (i.e., satisfaction) and motivations causal or correlational?

The two theories reviewed herein, personal investment theory and expectancy theory, appear to have some promise for adding cognitive dimensions and antecedent conditions. The former has been explored by two research projects and many unanswered questions remain as to its applicability and utility. The latter theory has not been tested in recreational or fishing recreation research and appears to hold some promise to integrate motivational research with a more comprehensive theoretical base so that the implications will be more apparent for fishery and recreation managers. Recent work by Ditton et al. (1992) suggests that additional approaches also merit investigation as more information is published on alternate or revised approaches to defining specialization.

Sportfishery management on the Great Lakes will require a more comprehensive model of angler specialization over time to anticipate angler behavioral reaction to sportfishery

management alternatives. This information can help fishery managers and educators to evaluate management alternatives that help to meet, redirect, or change angler motives and expectations. Anticipating angler development and redirecting and encouraging anglers toward higher degrees of specialization (i.e., shift from harvesting fish to a greater emphasis on resource conservation and appreciation) may, ultimately, lead to more effective indirect angler management and partially relieve the enforcement burden of direct angler regulations. Given the current economic impacts of sportfishing on the Great Lakes, the need to maintain angler participation and satisfactions is economically important for coastal communities and sportfishery dependent businesses.

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