

THE INFLUENCES OF GENDER ON FISHING PARTICIPATION IN NEW YORK'S EASTERN LAKE ONTARIO COUNTIES

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Abstract: Recreational fishing generates millions of dollars in visitor expenditures every year in New York's Great Lakes Region. While projected total participation in recreational fishing statewide is anticipated to increase between 1996 and 2005, the number of anglers in the 18- to 44-year-old age class is expected to decrease by an estimated 7.9% or 32,049 anglers. In order to identify factors that influence fishing participation in the 18- to 44-year-old age class, NY Sea Grant and the SUNY College of Environmental Science and Forestry conducted a mail survey of 1050 anglers (525 males and 525 females) in three eastern Lake Ontario Counties in 2001. Of the qualified sample of 957 anglers, 279 anglers (136 males and 143 females) returned surveys for a response rate of 29.2%. Anglers were asked to identify their level of fishing participation during their childhood, adolescence, and adult years, and to quantify their level of agreement/disagreement with statements concerning social and psychological factors that may have influenced their fishing participation. Descriptive statistics are used to identify significant differences in responses between genders. Results indicate that fishing participation by males and females is reliant on the social linkages related to fishing developed by anglers as well as the development of intrinsic values for fishing.

Introduction

As fisheries managers and promoters seek strategies for increasing angler participation, information concerning how males and females are initiated into fishing and the factors that influence their continued participation become more important. In New York State, the projected total participation in recreational fishing statewide is anticipated to increase between 1996 and 2005, while the number of anglers in the 18- to 44-year-old age class is expected to decrease by an estimated 7.9% or 32,049 anglers (Connelly et al. 1999). Although this projected decline is mainly due to changes in the population structure of New York State, identifying new market groups, such as female anglers, can be useful in offsetting future declines. Female anglers comprise only 12.3% of anglers fishing in New York State (Connelly et al. 1997), generating further questions about why relatively fewer females than males become involved in fishing.

In order to identify the social and psychological factors that influence fishing participation, this study examines fishing involvement during the major stages of development in the lives of female and male anglers (i.e., childhood,

adolescence, and adulthood). The hypotheses being tested are:

1. Significant differences exist between how females and males are initiated into fishing.
2. Significant differences exist between the mean levels of fishing participation for males and females during childhood, adolescence, and adulthood.
3. Significant differences exist between males and females concerning fish species sought, location of fishing activity, and individuals with whom anglers fished during childhood, adolescence, and adulthood.
4. Significant differences exist between males and females concerning the social and psychological factors that influence fishing participation during childhood, adolescence, and adulthood.

Background

The participation of adults in fishing has been linked to their childhood participation in fishing (Siemer et al. 1989). Other studies indicate that children who experience recreational activities with their parents are more likely to participate in these same activities as adults (Sofranko and Nolan 1972; Yoesting and Burkhead 1973; Siemer et al. 1989). Mannell and Kleiber (1997) discuss "socialization into leisure" as the process by which children "acquire the motives, attitudes, values, and skills that affect their leisure choices, behavior, and experiences throughout their lives." Duda and others (1999) state that "fishing is best understood as an aspect of family life given the fact that most anglers are initiated within the context of the family." Participation in recreational activities that involve a high skill level (e.g., fishing) may be more dependent on the process of leisure socialization than outdoor recreation activities involving a relatively low skill level (e.g., hiking). In addition, Kane (1990) suggests that the leisure socialization process of children is likely influenced by gender roles. While the leisure socialization of male children often focuses on "competence, mastery, and independence, female leisure socialization fosters dependency, restrictive exploration, and limited physical play" (Block 1982, as in Kane 1990).

Adolescence may be a crucial time in determining if individuals who fished as children continue to participate in fishing. According to Erikson (1963), adolescence is the developmental stage during which people develop a sense of identity through both identification with others and individuation (i.e., defining themselves as unique from others). In identifying themselves with others, adolescents may choose to continue participating in an activity that they did with their parents, but with individuals other than their parents. In defining themselves as different from others, adolescents may also begin to participate in recreational activities different from those in which their parents participate. Thus, adolescents may stop participating in activities, such as fishing, that they did as children with their parents, or they may try different types of related activities (e.g., a child taught to fish from the shoreline of a lake with his or her parents may switch to fishing from a motorboat). Shaw et al. (1995) notes that adolescents spent the highest proportion of their time (14.9% of total time) in social activities with friends. If fishing is not linked with

social activities during adolescence, fishing may not provide adequate interest to keep teens involved. If teens do not remain involved in fishing during adolescence, the likelihood that they will participate in fishing as adults may decrease.

As individuals mature into adults, the social and intrinsic values they develop related to fishing during adolescence may determine whether they continue to fish or not. Duda et al. (1999) found that many women are not fully initiated into fishing until adulthood. This late initiation may make it more difficult for females to develop an intrinsic value for the sport, causing them to either drop-out of fishing or fish less often than males.

Methods

In November, 2000, a random sample of the fishing license stubs of 1050 anglers (525 females and 525 males) was collected from the New York State Department of Environmental Conservation for anglers who purchased their licenses in 1999 in three eastern Lake Ontario counties of New York (i.e., Wayne, Oswego, and Jefferson Counties). The sample was constrained to anglers residing in New York State at the time of their license purchase, and who ranged in age from 18 to 44 during the year 2000. In order to obtain comparison data between males and females, the sample consisted of half females and half males.

Using the factors identified in a model explaining the social-psychological process of initiation and continued participation in wildlife recreation (Decker et al. 1987), psychological (internal) and social (external) factors identified as influencing fishing participation were identified. These factors included motivations for participation (i.e., opportunity, support from friends and relatives, expectations of friends and relatives, commitment to fishing, perceived fishing ability, value of fishing to the angler, and importance of fishing as a custom or tradition) and anglers' goals for fishing (i.e., affiliation, appreciation of natural resources, and achievement). Using these factors, a mail survey was designed to obtain information about the involvement of anglers in fishing during their childhood, adolescence, and adulthood.

Survey questions were short answer, and similar questions were used for each life stage to enable comparisons between life stages. Anglers were asked to check responses concerning their fishing initiation, as well as where, how, and with whom they fished as children, adolescents, and adults. Participation questions included for these life stages were based on three angler participation categories identified by Duda and others (1999): infrequent anglers (i.e., those who fished at least once in one to two of the past five years); sporadic anglers (i.e., those who fished at least once in three to four of the past five years); and avid anglers (i.e., those who fished at least once a year). Because the survey involved recall of childhood and adolescent experiences, survey questions concerning participation were modified to reflect these stages of development. Based on the frequency distributions of avid (i.e., annual) anglers, four levels of annual anglers were created. To

account for life stages during which respondents did not fish, a "no participation" category was created. Thus, seven levels of participation were identified: 0 – no participation; 1 – infrequent (i.e., respondents fished every other year or less); 2 – sporadic (i.e., respondents fished almost every year); 3 – annual-low (i.e., respondents fished on average between 1 and 5 times per year); 4 – annual-medium (respondents fished on average between 5.1 and 10 times per year); 5 – annual-high (i.e., respondents fished on average between 10.1 and 20 times per year); and 6 – annual-highest (i.e., respondents fished on average over 20 times per year).

Data concerning the goal of affiliation and the motivations influencing fishing participation were collected using questions based on a Likert-like scale ranging from -3 (strongly disagree) to 0 (neutral) to 3 (strongly agree). Questions on angler achievement and resource appreciation used a similar scale that ranged from -3 (highly unspecialized) to 0 (neutral) to 3 (highly specialized). Variables related to achievement and resource appreciation were identified from literature on fishing specialization (Bryan 1977; Chipman and Helfrich 1988; Fisher 1997). Variables were combined into factors representing the goals and motivations, and the mean value for each factor was calculated.

In January, 2001, the surveys were mailed to anglers. A modified Total Design Method (Dillman 1978) was used to increase the response rate of anglers to the survey. The first mailing of the survey was followed by a postcard reminder, an additional mailing of the survey, and finally an additional reminder postcard. Data from the completed surveys were entered into SPSS. Proportions of males and females selecting each categorical answer on the survey were compared using two-independent-sample z-tests. In addition, the mean ages of initiation and mean levels of participation for males and females during each life stage were compared using two-independent-sample t-tests. The means of the factors representing goals and motivations were compared for males and females having a participation level greater than 0 during each life stage with two-independent-sample t-tests.

The existence of nonresponse bias was checked by attempting to contact 50 nonrespondents. A short mail survey comprised of five questions about fishing participation during childhood, adolescence, and adulthood was sent to nonrespondents by certified mail. Follow-up telephone calls were used to contact those who did not respond to this short survey. Mean levels of participation during each life stage were compared between respondents and nonrespondents using two-independent-sample t-tests.

Limitations

The sampling and research methods used in this study involve the following four limitations.

1. The actual proportion of females involved in freshwater fishing in New York State (12.3% in 1996) is much lower than the proportion of males (87.7% in 1996; Connelly et al. 1997). Since equal numbers of males and females are sampled for this study, the sample of female anglers may

be more representative of the population of female anglers than is the sample of male anglers of the population of male anglers.

2. The sample includes only anglers who purchased their licenses in the eastern New York counties along Lake Ontario in New York State. It is likely that respondents participate in Great Lakes fishing more frequently than anglers who purchase their fishing licenses elsewhere.

3. Anglers who fish in the counties along eastern Lake Ontario but who purchased their licenses outside of this area will not be included in the sample. It is assumed that the majority of anglers who fish in the counties bordering eastern Lake Ontario will have purchased their licenses in these counties.

4. The results of this study may be subject to recall biases since anglers are asked to recall their fishing participation during childhood and adolescence.

Results and Discussion

A total of 1050 surveys were mailed to anglers. Following the removal of undeliverable surveys from the sample, a qualified sample of 477 female and 480 male anglers was identified from the original sample of 525 female and 525 male anglers. From this qualified sample, 143 female and 136 male anglers returned completed surveys for a response rate of 30.0% (females) and 28.3% (males). The total response rate for females and males combined was 29.2%.

Contact with 25 nonrespondents was made. Two-independent-sample t-test comparisons between survey respondents and nonrespondents revealed a significant difference ($p \leq 0.05$) between the adult mean levels of participation for respondents (3.90) and nonrespondents (2.88). These data indicate that participation levels for the population of anglers residing within the eastern Lake Ontario counties sampled may be lower than shown in this study.

Demographics

The sample was comprised of 51% females and 49% males. Ages of respondents ranged from 18 to 44, with an average age of 33. The average respondent had 13.7 years of schooling. Thirty-four percent of respondents did not have children, while 66% did. The majority of respondents lived with their spouse/significant other and with or without children (78%), while 8% lived with their parent(s) or other relatives, 7% lived alone, 4% were single parents living with or without children, and 3% of lived with friends or in college dorms. While the majority of respondents were Caucasian (91%), 1% of the respondents were African American, 6% were Native American, and 2% were of other racial or ethnic backgrounds. With regard to residence location, 61% of respondents lived in rural areas or villages (under 5,000 in population), 22% in small cities or suburbs (between 5,000 and 24,999), 12% in medium cities (between 25,000 and 99,999), and 5% in large cities (over 100,000). The analysis of demographic variables indicates that the sample is largely representative of married Caucasian anglers residing in rural areas and small cities.

Initiation

The mean initiation age for all female respondents ($n = 130$) was 9.8 years of age and was significantly different from the mean initiation age of 6.8 years for all males ($n = 129$; $p \leq 0.05$). However, there was no significant difference between the mean initiation age of females (6.1 years) and males (6.2 years) who began fishing as children ($n = 101$ and $n = 125$, respectively). A larger proportion of female respondents overall began fishing as adolescents (6% of all female respondents) and adults (14%) compared to male respondents (1% of all male respondents began fishing as adolescents and 2% began as adults). Females who begin fishing later in life may not develop the same social and intrinsic linkages with fishing as males.

The individuals responsible for initiating anglers into fishing (i.e., initiators) were identified. Most responding anglers were initiated into fishing by their fathers (Table 1), with no significant difference existing between males and females for this initiator category. Significant differences were identified between the proportions of female (13%) and male anglers (31%) initiated into fishing by relatives other than their parents (Table 1). These data indicate that socialization into fishing during childhood within the immediate family may differ from that with relatives outside of the immediate family. Significant differences were also noted between the proportions of males and females initiated into fishing by their spouse or significant other, and by themselves.

Survey respondents were also asked to identify the factors that influenced their initial fishing participation (Table 2). Success at catching fish and the skills of the initiators were the most influential factors. While no significant difference exists between the proportions of females and males influenced by the skills of their initiator, a significant difference did exist concerning those influenced by success at catching fish. The lower proportion of females influenced by success indicates that females may be more interested in aspects of the fishing experience other than catching fish (e.g., socializing).

Table 1 A comparison of the proportions of female and male anglers according to the individual who initiated them to fishing.

Initiator	Proportion	
	Females ^a	Males ^b
Father	0.63	0.74
Mother	0.18	0.12
Spouse/Sig. other	0.22	0.00
Sibling	0.14	0.10
Relative	0.13	0.31
Organization leader	0.03	0.05
Friends (clarify)	0.08	0.12
Self	0.04	0.10
Other adults	0.02	0.02

^aN_{females} = 142

^bN_{males} = 135

* Significant differences identified through a two-independent-sample z-test (p -value ≤ 0.05) are in bold.

Table 2 A comparison of the proportions of male and female respondents identifying characteristics that influenced their initial fishing participation.

Factor	Proportion*	
	Females ^a	Males ^b
Watching fishing shows on TV	0.15	0.23
Visiting fish hatcheries	0.15	0.21
Initiator's knowledge and skills	0.52	0.50
Learning about fish in school	0.01	0.05
Reading fishing publications	0.05	0.23
Seeing fish/fishing exhibits	0.08	0.14
Success at catching fish	0.61	0.82
No factors influenced initiation	0.06	0.01
Other	0.13	0.05

^aN_{females} = 142

^bN_{males} = 135

* Significant differences identified through a two-independent-sample z-test (p-value ≤ 0.05) are in bold.

Angler participation

Analysis of the proportions of male and female respondents who fished during childhood and adolescence reveal significant differences (p-values ≤ 0.05) during both childhood and adolescence. While 97% of males who currently fish as adults fished as children, a lower percentage of female respondents (80%) fished as children. Likewise, while 95% of current male respondents fished as adolescents, 77% of female respondents fished during that life stage.

Mean levels of fishing participation differed significantly between female and male respondents during childhood, adolescence, and adulthood as well. For all respondents (including those who did not fish during childhood and/or adolescence; Table 3), significant differences occurred between males and females during childhood, adolescence, and adulthood. When the participation levels of only those male and female respondents who did fish during each life stage were compared, significant differences continued to exist at each life stage. For both respondent groups, the mean level of participation for female respondents was lower than the mean level for male respondents. In addition, while the mean level of participation for males increased from childhood to adolescence, it decreased for females during this same transition in life stage.

Table 3 Mean participation levels for males and females. "All respondents" includes those who did not fish during childhood and/or adolescence.

Respondent groups	Life stage	Mean*	
		Females	Males
All respondents	Childhood ^a	2.85	4.29
	Adolescence ^b	2.67	4.39
	Adulthood ^c	3.41	4.40
Respondents who fished during life stage only	Childhood ^d	3.59	4.42
	Adolescence ^e	3.48	4.63
	Adulthood ^c	3.41	4.40

^aN_{females} = 136 and N_{males} = 136

^bN_{females} = 141 and N_{males} = 134

^cN_{females} = 139 and N_{males} = 136

^dN_{females} = 108 and N_{males} = 132

^eN_{females} = 108 and N_{males} = 127

* Significant differences identified through a two-independent-sample z-test (p-value ≤ 0.05) are in bold.

Characteristics of fishing activity

The diversity of fish species sought by anglers also differed significantly between life stages for male and female respondents. During childhood, male respondents fished for an average of 4.6 different species of fish while females fished for an average of 3.4 species (significant at p-value ≤ 0.05). Similar significant differences existed for respondents during adolescence (females fished for 3.8 species on average and males fished for 5.3 species) and adulthood (females fished for 4.2 species on average and males fished for 5.5 species). During each life stage, over 50% of female respondents fished for bass, bullhead, and perch, while over 50% of male respondents sought these species as well as other species.

Respondents generally fished in a diversity of waterbodies during childhood, adolescence, and adulthood. Ponds and small creeks were commonly chosen during childhood. In adolescence, creeks and small lakes were commonly chosen. Waterbody size tended to increase during adulthood, when most respondents fished in the Great Lakes. For all waterbodies, the proportion of males fishing each type of waterbody is greater than the proportion of females.

The fishing location most commonly chosen by respondents during all life stages is "from shore" (Table 4). Fishing from motorized and nonmotorized boats was also common for respondents. Significant differences in fishing from motorized and nonmotorized boats are shown for male and female respondents during adolescence and adulthood. In addition, a significant difference during all life stages exists for wading in streams, and for wading in lakes during adolescence and adulthood. The socialization of females into fishing may involve fishing experiences that are less exploratory than those experienced by males.

The individual(s) with whom respondents fished varies by life stage (Table 5). During childhood, large proportions of male and female respondents fished with their parent(s). During adolescence, the proportions of respondents who fished with parent(s) declined while the proportions fishing

with friends increased. In adulthood, responding anglers fished the most with either their spouse or friends. Significant differences were noted between male and

female respondents at all life stages for fishing with friends and alone, and during adulthood for respondents fishing with their spouse or significant other.

Table 4 A comparison of proportions of female and male respondents for the locations from which they fished.

Location	Proportion*					
	Childhood ^a		Adolescence ^b		Adulthood ^c	
	Females	Males	Females	Males	Females	Males
From a motorboat	0.41	0.51	0.53	0.67	0.62	0.85
From a non-motorized boat	0.32	0.39	0.27	0.50	0.35	0.51
From shore	0.97	0.96	0.94	0.97	0.85	0.88
Wading in lakes	0.18	0.26	0.22	0.44	0.16	0.39
Wading in streams	0.17	0.35	0.21	0.53	0.28	0.50
Other	0.03	0.01	0.06	0.05	0.07	0.11

^aN_{females}=107 and N_{males}=130

^bN_{females}=109 and N_{males}=126

^cN_{females}=134 and N_{males}=132

* Significant differences identified through a two-independent-sample z-test (p-value ≤ 0.05) are in bold.

Table 5 A comparison of the proportions of females and males according to the individuals with whom respondents fished.

Individual	Proportion*					
	Childhood ^a		Adolescence ^b		Adulthood ^c	
	Females	Males	Females	Males	Females	Males
Parent(s)	0.84	0.80	0.68	0.62	0.26	0.23
Spouse/Significant other	na	na	na	na	0.81	0.41
Angler's children	na	na	na	na	0.50	0.49
Sibling(s) ^d	0.62	0.52	0.54	0.54	--	--
Relative(s)	0.45	0.51	0.34	0.44	0.29	0.39
Other adult(s)	0.24	0.38	0.28	0.36	na	na
Friend(s)	0.29	0.58	0.52	0.81	0.43	0.81
Self	0.27	0.48	0.36	0.73	0.25	0.65
Club members	0.03	0.09	0.06	0.04	0.01	0.04

^aN_{females}=107 and N_{males}=130

^bN_{females}=108 and N_{males}=126

^cN_{females}=135 and N_{males}=132

^d"Sibling(s)" were grouped with "Relative(s)" in the adulthood category.

* Significant differences identified through a two-independent-sample z-test (p-value ≤ 0.05) are in bold.

Social and psychological factors influencing fishing participation

The three goals identified by Decker and others (1987) for individuals involved in wildlife-related recreation are affiliation, appreciation of natural resources, and achievement. While significant differences were identified between male and female respondents during all life stages for affiliation and achievement, no significant differences were identified for resource appreciation (Table 6).

Results for comparisons between male and female anglers for the seven motivational factors chosen for comparison (Decker et al. 1987) reveal important differences between males and females during all life stages (Table 6). The perceived opportunity of anglers is higher for male respondents than females at all life stages, although a significant difference occurs during adolescence only. The support and expectations of family and friends perceived by male respondents during all life stages were greater than those perceived by females. Custom (i.e., the traditional

importance of fishing to respondents) was found to be significantly different for male and female respondents during adulthood. Perceived ability and commitment to fishing were higher for male respondents than for females, with significant differences occurring at all life stages. The value of fishing to respondents was moderately high during all life stages, but only significantly different between males and females during adulthood.

Conclusion

Both similarities and differences were identified between male and female respondents for initiation, participation, fishing characteristics, and the social and psychological factors influencing participation. While only differences between males and females were hypothesized concerning initiation, both differences and similarities were identified. Twenty percent of female respondents began fishing either during adolescence or adulthood. This "late start" could be linked to the lower proportion of females initiated by relatives outside of their immediate family as children (i.e.,

females may have fewer potential initiators) or by themselves. Initiation for both males and females is influenced by the initiator's skills and the angler's success. If anglers are not successful at catching fish or do not improve their fishing skills, they may lose interest in the sport over time and fish less.

Significant differences were hypothesized for the levels of fishing participation for males and females, and were noted during childhood, adolescence, and adulthood. It is likely that the levels of participation of anglers influences their skill development, and, consequently, their development of an intrinsic value for the sport of fishing. In addition, a slight decline in the mean participation level occurred for females during adolescence, a time when the mean participation level for males increased. It is likely that participation is strongly linked to social interaction during this life stage. Males may more easily link fishing with social interaction during adolescence than females because they may be more likely to have friends that fish.

Both similarities and differences were identified for the fishing characteristics of male and female respondents, though only significant differences were hypothesized. Female respondents sought a lower diversity of fish and used less exploratory methods of fishing. While similarities for fishing partners exist within the immediate family of respondents during childhood, lower proportions of females fished with relatives outside the immediate family and by themselves. The fishing experiences of females may not be as effective at stimulating an interest in the sport as those of males, and may be limited by fewer fishing partners.

The final hypothesis examined by this study is that significant differences exist between males and females concerning the social and psychological factors thought to influence fishing participation during all life stages. Female respondents, with lower levels of perceived ability, achievement, and commitment, may not be adequately developing an intrinsic value for fishing. Male respondents, in contrast, may have a stronger intrinsic value for fishing, contributing to their higher level of participation during adulthood. The development of an intrinsic value for fishing is likely linked to anglers' level of participation during childhood and adolescence. Thus females, who participate less in fishing than males during childhood and adolescence, may be developing weaker intrinsic values for fishing than male respondents.

In conclusion, significant differences were noted for participation, initiation, fishing characteristics, and social and psychological factors influencing fishing participation. Similarities, however, were also noted. While similarities are more common between male and female respondents during childhood, fewer are noted during adolescence when social linkages strongly influence fishing participation. It is likely that continued fishing participation during adulthood is reliant on the development of social linkages related to fishing and of an intrinsic value for fishing.

Table 6 Social and psychological factors influencing participation for male and female respondents during childhood, adolescence, and adulthood.

Factor	Mean*					
	Childhood ^a		Adolescence ^b		Adulthood ^c	
	Females	Males	Females	Males	Females	Males
Affiliation ^e	0.50	1.38	0.27	1.47	0.88	1.74
Resource appreciation ^d	-1.08	-1.04	-0.66	-0.44	-0.35	-0.04
Achievement ^e	-1.83	-1.46	-1.38	-0.48	-0.88	0.06
Opportunity ^e	1.68	2.05	1.35	1.92	2.25	2.46
Support ^e	0.84	1.65	0.72	1.57	0.63	0.83
Expectations ^e	-1.08	0.08	-0.28	0.52	0.56	1.86
Custom ^e	0.78	0.47	0.25	0.25	0.82	1.33
Perceived ability ^e	0.94	1.52	1.33	2.04	1.52	2.30
Commitment ^e	-1.34	-0.48	-1.06	-0.15	-0.90	-0.24
Value of fishing ^e	2.34	2.25	2.14	2.24	2.21	2.44

^aN_{females} = 106 and N_{males} = 130

^bN_{females} = 109 and N_{males} = 128

^cN_{females} = 134 and N_{males} = 134

^d rated on a scale of -3 (highly unspecialized) to 0 (neutral) to 3 (highly specialized)

^e rated on a scale of -3 (strongly disagree) to 0 (neutral) to 3 (strongly agree)

*Significant differences identified through a two-independent-sample t-test ($p \leq 0.05$) shown in bold

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