

Sportfishing:

A study of gender and life stage along New York's eastern Lake Ontario coast

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Introduction

As fisheries managers and promoters look for ways to increase angler participation, information about the social and psychological factors influencing the fishing participation of males and females becomes important. In New York State, the projected *total* participation in sportfishing statewide is anticipated to increase between 1996 and 2005. However, in this same timeframe, 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), a decline mainly due to population shifts. In order to offset this projected decline, identifying angler market groups with growth potential is essential. One such group is female anglers. In 1996, this market group comprised only 12.3% of the anglers in New York State (Connelly et al. 1997). This low percentage generates questions about why relatively few females (in comparison to males) fish, and about the factors influencing their participation in fishing.

This study examines the fishing involvement of female and male anglers during three major life stages (i.e., childhood, adolescence, and adulthood) in order to identify the factors that influence fishing participation. Conducted between 2000 and 2002, the study was comprised of a mail survey and interviews with both anglers and non-anglers. Funding for this study was provided by NY Sea Grant and the SUNY College of Environmental Science and Forestry.

Methods

In November 2000, a random sample of the fishing license stubs of 1,050 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 (Wayne, Oswego, and Jefferson Counties). The sample was limited 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 a model by Decker and others (1987) that suggests how individuals become involved in wildlife-related recreation, the psychological and social factors influencing fishing participation were identified. These factors were composed of *motivations* for participation such as opportunity (i.e., access to fishing equipment and locations), support from friends and relatives, expectations of friends and relatives, commitment to fishing, the angler's perceived fishing ability, the value

(i.e., importance) of fishing to the angler, and the importance of fishing as a custom or tradition to the angler, as well as anglers' *goals* for fishing that included affiliation (i.e., the need to socialize while recreating), appreciation of natural resources, and the achievement associated with recreating (e.g., catching a fish of a desired size or species). Using these factors, a mail survey was designed to obtain information about fishing participation for anglers during their childhood, adolescence, and adulthood.

In January 2001, 1,050 questionnaires were mailed to anglers using a modified Total Design Method (Dillman 1978); the first mailing of the questionnaire was followed by a postcard reminder, an additional mailing of the questionnaire, and finally an additional reminder postcard. Mail survey questions were short answer, and similar questions were used for each life stage to enable comparisons among life stages. Anglers were asked to check responses concerning their fishing initiation as well as where, how often, and with whom they fished as children, adolescents, and adults. Questions related to the factors influencing fishing participation were based on a Likert-like scale ranging from -3 (strongly disagree) to 0 (neutral) to 3 (strongly agree). Survey respondents were also asked to return interview permission forms that were mailed with the questionnaires.

Data from the completed questionnaires were analyzed using SPSS computer software. Seven levels of participation were identified for respondents: 0 – no participation; 1 –infrequent (i.e., respondents fished every other year or less; based on Duda et al. 1999); 2 – sporadic (i.e., respondents fished almost every year; based on Duda et al. 1999); 3 – annual-low (i.e., respondents fished on average between 1 and 5 times per year); 4 – annual-medium (i.e., 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 years); and 6 – annual-highest (i.e., respondents fished on average over 20 times per year). Significant differences (p -value ≤ 0.05) between males and females during each life stage were identified for the responses to each question, the mean ages of angler initiation into fishing, mean levels of fishing participation for each life stage, and the means of the factors representing goals and motivations. In addition, responses to ques-

Table 1. Demographics of responding anglers.

Demographic characteristic	Category	Percentage/Mean
Gender	Females	51%
	Males	49%
Age		Range 18 to 44 yrs. Mean 33 yrs.
Education		Mean 13.7 yrs.
Household	Respondent lives with spouse/significant other and with/without children	78%
	Respondent lives with parent(s)/other relatives	8
	Respondent lives alone	7
	Respondent is a single parent living with/without children	4
	Respondent lives in college dorm or with friends	3%
Children	Respondent has children	66%
	Respondent does not have children	34%
Race	Caucasian	91%
	Native American	6
	African American	1
	Other	2%
Location of residence	Rural areas or villages under 5,000 in population	61%
	Small cities or suburbs between 5,000 and 24,999 in population	22
	Medium cities between 25,000 and 99,999 in population	12
	Large cities over 100,000 in population	5%

tions on goals and motivations were used to conduct a discriminant analysis, a statistical analysis technique used to indicate the influence of several factors (i.e., the goals and motivations) on another single factor (i.e., level of fishing participation). The results of the discriminant analysis were used to calculate potency values, numbers that indicate the relative influence (i.e., strong versus weak) of the goals and motivations on fishing participation.

In addition to the mail survey, angler and non-angler interviews were conducted. Twenty-one male and 20 female anglers were randomly selected from the returned interview permission forms and contacted by telephone. Interviews ranged in length from 15 to 45 minutes and were tape recorded for accuracy. Interviewees were asked to provide contact information for friends and relatives who either did not fish or who fished infrequently. These “non-anglers” were telephoned and asked if they would be willing to be interviewed about their lack of or limited involvement in fishing. Six male and 10 female non-anglers were interviewed. Non-angler interviews ranged in length from five to ten minutes. Comments from all interviewees were studied to identify the factors influencing fishing participation.

Results

Of the 1,050 surveys mailed to anglers, 957 anglers (477 females and 480 males) remained in the qualified sample following the removal of undeliverable addresses. From this qualified sample, 143 female and 136 male anglers returned completed surveys for a response rate of 30% for females and 28% for males. The overall response rate for females and males combined was 29%.

Respondent demographics. The sample of survey respondents was largely representative of married, Caucasian anglers residing in rural areas and small cities. Specific demographic information is included in Table 1.

Initiation. The average age at which female respondents began to fish was 9.8 years of age (“n” or number of respondents = 130) and was significantly different from the average initiation age of 6.8 years for males (n = 129). However, there was no significant difference between the mean initiation ages of females (6.1 years; n = 101) and males (6.2 years; n = 125) who began fishing as children. Larger proportions of female respondents began fishing as adolescents (6% of all female respondents) and adults (14%), while only 1% of male respondents began fishing as adolescents and 2% as adults.

The individuals responsible for initiating anglers into fishing (i.e., initiators) were identified. Most responding anglers were initiated into fishing by their fathers (Table 2), with no significant difference existing between male and female respondents for this initiator category. Significant differences were identified between the percentages of female (13%) and male (31%) respondents initiated into fishing by relatives other than their parents (Table 2). These data indicate that initiation by relatives outside of the immediate

Table 2. A comparison of the percentages of female and male anglers according to the individual who initiated them into fishing. Significant differences between genders are identified in bold (p-value ≤ 0.05).

Initiator	Percentages ^a	
	Females ^b	Males ^c
Father	63%	74%
Mother	18	12
Spouse/Significant other	22	0
Sibling	14	10
Relative	13	31
Organization leader	03	5
Friends	8	12
Self	4	10
Other adults	2%	2%

^aPercentages total more than 100% because of frequent respondent initiation by multiple initiators.

^bNumber of female respondents (n) = 142.

^cNumber of male respondents (n) = 135.

family differs significantly between males and females, possibly due to perceptions of fishing as a sport more often participated in by males. Significant differences were also noted between the percentages of males and females initiated into fishing by their spouse or significant other (22% of females and 0% of males), and by themselves (4% of females and 10% of males).

Survey respondents were also asked to identify the factors that influenced their initial fishing participation (Table 3). Success at catching fish and the skills of initiators were the most influential factors. While no significant difference exists between the percentages of females and males influenced by the skills of their initiators, a significant difference did exist for those influenced by success at catching fish. The lower percentage 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). In addition, angler and non-angler interviews revealed that the opportunities that anglers had to fish were crucial to their successful initiation into the sport.

Table 3. A comparison of the percentages of male and female respondents identifying characteristics that influenced their initial fishing participation. Significant differences are in bold (p -value ≤ 0.05).

Factor	Percentages	
	Females ^a	Males ^b
Watching fishing shows on TV	15%	23%
Visiting fish hatcheries	15	21
Initiator's knowledge and skills	52	50
Learning about fish in school	01	5
Reading fishing publications	5	23
Seeing fish/fishing exhibits	8	14
Success at catching fish	61	82
No factors influenced initiation	6	1
Other	13%	5%

^an_{females} = 142

^bn_{males} = 135

Table 4. Average participation levels for males and females. "All respondents" includes those who did not fish during childhood and/or adolescence. Significant differences are in bold (p -value ≤ 0.05).

Respondent group	Average	
	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

Angler participation. Analysis of the percentages of male and female respondents who fished during each life stage reveals significant differences 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 responding male anglers 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. When all respondents (including those who did not fish during childhood and/or adolescence; Table 4) were considered, significant differences were found 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, with the mean level of participation for females being lower than the mean level for males.

Characteristics of fishing activity. The characteristics of fishing activity that were studied included diversity of fish species sought, types of waterbodies used for fishing, fishing locations in general (e.g., fishing from shore, fishing from a boat), and the individuals with whom anglers fished (i.e., fishing partners). The diversity of fish species sought by anglers during each life stage differed significantly (p -value ≤ 0.05) for male and female respondents. During childhood, male respondents fished for an average of 4.6 different species while females fished for an average of 3.4 species. 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 and males fished for 5.5 species). During each life stage, the majority of female respondents fished primarily for bass, bullhead, and perch, while the majority of males sought additional species (e.g., trout) as well.

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. Overall, the proportion of males fishing each type of waterbody was greater than the proportion of females.

The fishing location most commonly chosen by respondents during all life stages was “from shore” (Table 5), with no significant difference found between genders. While fishing from motorized and nonmotorized boats was also common for respondents, significant differences did exist between males and females during adolescence and adulthood, with a higher percentage of males fishing from both types of boats. In addition, significant differences between male and female respondents exist during all life stages for “wading in streams” and during adolescence and adulthood for “wading in lakes,” with higher percentages of males fishing in both of these locations.

The individuals with whom respondents fished also varied by life stage (Table 6). During childhood, large percentages of male and female respondents fished with one or both of their parents. During adolescence, the percentages of respondents who fished with parents declined while the percentages fishing with friends increased. In adulthood, responding anglers fished most with either their spouse or friends. Significant differences were noted between males and females at all life stages for fishing with friends and fishing alone, and during adulthood for fishing with their spouse or significant other.

Factors influencing fishing participation. The influence of the goals and motivations on fishing participation is indicated by the potency values listed in Table 7. High potency values indicate a strong influence of the factor on fishing participation, while the opposite is true of relatively lower potency values. Opportunity and perceived ability, for example, both have high potency values, indicating the strong influence of these factors on fishing participation for both males and females during childhood. In addition, support and custom (with moderate potency values) have a moderate influence on female participation during childhood, while custom and value of fishing have a moderate influence on participation for males. During adolescence, female participation is strongly influenced by support, affiliation, and commitment, while male participation continues to be strongly influenced by opportunity, perceived ability, and the value of fishing. During adulthood, affiliation and commitment continue to strongly influence female fishing participation, while male participation is strongly influenced by the expectations of others, commitment, and perceived ability. These results indicate that the influence of different factors on participation begins in childhood, and changes through adolescence and into adulthood. Differences between genders are also notable, with female participation more strongly influenced by social factors such as affiliation and support from family and friends, and male participation influenced more by the sport-related factors of perceived ability and value of fishing.

Data analyzed from angler interviews reveal similar findings. During the early involvement of anglers in fishing (i.e., childhood for most), traditions related to fishing positively influenced more of the males interviewed than the females, likely because of the historic male-orientation of fishing. The opportunity an angler had to fish and the enjoyment he or she derived from fishing were also important influences on early participation. During adolescence, traditions continued to positively influence the participation of a greater percentage of males than females, while support of family and friends appeared to positively influence the participation of a greater percentage of females. During adulthood, time

constraints (i.e., limitations on fishing opportunities), resource appreciation, and commitment appeared to influence the participation of both male and female respondents.

Interview data suggest that both male and female interviewees also developed social values (i.e., the social aspect of fishing is important to the angler) and sport-related values (i.e., the sporting aspect of fishing is important to the angler) associated with fishing during adolescence. The development of these values influenced the participation of interviewees later in life. During adulthood, 31% of female interviewees indicated that they valued the social aspect of fishing while 69% valued both the social and sport-related aspects of fishing; none valued the sport-related aspect alone. In contrast, 14% of males valued the sport-related aspect of fishing exclusively, while 86% valued the social and sport-related aspects; none valued the social aspect alone. Social interaction appears to be an integral part of the female fishing experience, while the sporting aspect of fishing is important to the male experience.

Results from interviews of non-anglers reveal other important factors. While most of the non-anglers had fished during childhood, 40% of females and 33% of males had stopped because of the “boredom” they associated with fishing; 40% of females and 17% of males stopped because of their extreme dislike of handling live or cut bait. These dislikes were the major reported causes for the drop out of these interviewees from the sport.

Table 5. A comparison of percentages of female and male respondents for the locations from which they fished. Significant differences are in bold (p-value ≤ 0.05).

Location	Percentage ^a					
	Childhood ^b		Adolescence ^c		Adulthood ^d	
	Females	Males	Females	Males	Females	Males
From a motorboat	41%	51%	53%	67%	62%	85%
From a nonmotorized boat	32	39	27	50	35	51
From shore	97	96	94	97	85	88
Wading in lakes	18	26	22	44	16	39
Wading in streams	17	35	21	53	28	50
Other	3%	1%	6%	5%	7%	11%

^aPercentages total more than 100% because of use of multiple locations by respondents.

^b $n_{\text{females}} = 107$ and $n_{\text{males}} = 130$

^c $n_{\text{females}} = 109$ and $n_{\text{males}} = 126$

^d $n_{\text{females}} = 134$ and $n_{\text{males}} = 132$

Table 6. A comparison of the percentages of females and males according to the individuals with whom respondents fished. Significant differences are in bold (p-value ≤ 0.05).

Fishing partner	Percentage					
	Childhood ^a		Adolescence ^b		Adulthood ^c	
	Females	Males	Females	Males	Females	Males
Parent(s)	84%	80%	68%	62%	26%	23%
Spouse/Significant other	n.a.	n.a.	n.a.	n.a.	81	41
Angler's children	n.a.	n.a.	n.a.	n.a.	50	49
Sibling(s) ^d	62	52	54	54	—	—
Relative(s)	45	51	34	44	29	39
Other adult(s)	24	38	28	36	na	na
Friend(s)	29	58	52	81	43	81
Self	27	48	36	73	25	65
Club members	3%	9%	6%	4%	1%	4%

^a $n_{\text{females}} = 107$ and $n_{\text{males}} = 130$

^b $n_{\text{females}} = 108$ and $n_{\text{males}} = 126$

^c $n_{\text{females}} = 135$ and $n_{\text{males}} = 132$

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

Conclusion

Both similarities and differences were identified between male and female respondents for initiation, participation, fishing characteristics, and social and psychological factors influencing participation. One important difference in initiation is that 20% of female respondents began fishing either during adolescence or adulthood, while few males did. This “late start” for females could be linked to the lower percentages of females initiated into fishing by relatives outside of their immediate family as children (i.e., females may have fewer potential initiators) or by themselves. One important similarity between genders is that initiation for both males and females is influenced by the opportunity the angler has to fish, the initiator’s skills, and the angler’s success. This information indicates that if anglers do not fish frequently, they may not improve their fishing skills and may not be successful at catching fish. Over time, these factors may negatively influence their enjoyment and participation in the sport.

Examination of survey and interview data reveal differences in levels of fishing participation between males and females during childhood, adolescence, and adulthood, with levels of female participation being lower during all stages. Lower levels of participation of females during childhood may be the result of fewer initiators existing for females during this life stage. During adolescence, it is likely that the interest of anglers in socializing with peers was related to participation levels. Because of the small percentage of females who fish in New York State, female anglers may have difficulty identifying female peers with whom they can fish during adolescence; the opposite is likely to be true for males. Female adolescents who have difficulty finding peers with whom they can fish may fish less or drop out of the sport and may be unlikely to reenter it as an adult unless a friend or spouse encourages their participation. Thus, it seems likely that levels of participation established during childhood and adolescence influence participation during adulthood.

Both similarities and differences were identified for the fishing characteristics of female and male respondents. In general, throughout their lives female respondents sought a lower diversity of fish species and used less exploratory methods to fish than did males, possibly limiting the excitement and challenge of fishing for females. While similarities in fishing partners exist within the immediate family for both males and females, lower percentages of females fished with relatives outside the immediate family, with friends, and by themselves. Thus, the frequency of female fishing experiences may be limited by the availability of fewer fishing partners and by a low interest in fishing alone.

Interview data reveal differences in the fishing-related values developed by female and male anglers during all life stages. Female interviewees appear to have developed a strong social value for fishing and a weaker sport-related value. Because of their desire for social interaction as part of the fishing experience, females are less likely than males to fish by themselves, leading to lower participation levels.

Table 7. A comparison of the influence of social and psychological factors on participation for male and female respondents during childhood, adolescence, and adulthood using potency values.

Factor	Potency Values					
	Childhood		Adolescence		Adulthood	
	Females	Males	Females	Males	Females	Males
Affiliation	*	*	0.354	0.218	0.458	0.240
Resource appreciation	*	*	*	*	*	*
Achievement	*	*	*	*	*	*
Opportunity	0.549	0.362	0.243	0.457	*	*
Support	0.236	*	0.317	*	0.150	*
Expectations	*	*	*	0.194	0.181	0.387
Custom (tradition)	0.207	0.210	0.252	*	*	*
Perceived ability	0.384	0.726	0.172	0.383	*	0.363
Commitment	*	0.158	0.415	0.231	0.385	0.368
Value of fishing	*	0.236	*	0.367	*	0.180

*Potency value was less than 0.150, indicating a slight-to-negligible influence on participation.

Male respondents, in contrast, appear to have developed a strong sport-related value and weaker social value for fishing, contributing to their higher level of participation during adulthood. Anglers who strongly value the sport-related aspects of fishing will fish with or without fishing partners unless their recreation-related values change or other constraints prevent them from fishing. The development of values associated with fishing in general appears to largely determine if an individual will continue fishing through life.

Based on the results of this study, the key to increasing fishing participation, both in males and females, is to foster in individuals *early in life* the development of fishing-related social and sport-related values. Increased opportunities for females to participate as children are needed in schools and organizations. In addition, public awareness of the importance of adult support for childhood fishing participation, particularly for females, needs to be expanded. Successful strategies for teaching children how to fish (e.g., fishing in areas with high catch rates, such as panfish ponds, to prevent boredom, and baiting hooks for children who express a dislike for handling bait) should also be utilized. Detailed promotional, educational, and managerial strategies for children, adolescents, and adults are included in *Strategies for increasing sportfishing participation in New York's Great Lakes Region* (Kuehn 2003). In conclusion, expanding participation by both male and female anglers depends on supporting childhood involvement and developing social mechanisms that foster the continuation of fishing involvement through adolescence and into adulthood.

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