NEW YORK'S NEW HUNTERS:

INFLUENCES ON HUNTING INVOLVEMENT FROM BEGINNING TO END

By

Ken G. Purdy, Daniel J. Decker, and Tommy L. Brown

May 1989

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INTRODUCTION

Traditionally, wildlife management agencies have devoted much of their programming efforts to meet the needs of a primary constituency--recreational hunters. Although many agencies have expanded their programs to meet broader public demand for wildlife resources, the interests of recreational hunters have continued to be a primary focus of management. In recent years, however, downward trends in hunting participation have aroused the concern of many wildlife managers. In much of the United States the proportion of persons in the general population who participate in hunting has been declining (USFWS 1988). New York is no exception (Brown et al. 1987).

Since 1980, participation in New York's mandatory Hunter Training Course, representing the potential recruitment into the hunter population, has undergone a dramatic decline. Brown et al. (1987) reported a 45% decline in graduates from 1981 to 1985, and more recent records of course graduates indicate a continuation of this trend (New York State Department of Environmental Conservation, unpubl. data). Considering demographic and social trends such as increasing urbanization, an aging population and changing family structures, further reductions in hunting involvement seem likely.

Some wildlife agencies are trying to identify causes for the dwindling rates of participation in hunting. Impediments to hunting participation that can be alleviated through agency programs are being addressed. These efforts hold promise for mediating some of the problems of retention of people who want to hunt. As with all such efforts, the outcomes of new or modified hunting programs will depend partly upon the quality of information available as input for planning. This study was developed to provide information that planners will need to develop effective hunter retention programs.

BACKGROUND

In 1983 the New York State Department of Environmental Conservation (DEC) commissioned the Human Dimensions Research Unit (HDRU) in the Department of Natural Resources at Cornell University to conduct a long-term investigation of hunting participation in New York. Previous DEC/HDRU cooperative research (e.g., Brown et al. 1981; Decker et al. 1984, 1986a; Decker and Purdy 1986; Purdy et al. 1985), as well as studies conducted elsewhere (e.g., Applegate 1982, Applegate and Otto 1982, Hautaloma and Brown 1979), have indicated that people's decisions to participate (or not) in recreational hunting are largely influenced by social and psychological factors rather than wildlife resource-related considerations. This study was developed to examine such factors in more detail to provide a better understanding of hunting initiation, continuation, and desertion and how these behaviors might be affected by planned intervention.

In 1984, names and addresses of 6,000 graduates of New York's 1983 firearms Hunter Training Course (HTC) were selected from comprehensive statewide lists of HTC participants[1]. This "panel" represented the cohort of potential 1983 recruits to hunting in the state. The panel was surveyed by mail in spring of 1985--53% (2,881) of the deliverable questionnaires were returned. The first survey focused on establishing baseline information about the bases for individuals' hunting interests and participation. Preliminary tests were also conducted for 22 hypotheses developed to assess relationships between participation in hunting and important social-psychological influences

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[1]For a detailed discussion of the methodological approach to the first phase of this investigation, see Purdy and Decker (1986).

of participation. Results of the first phase of this study were reported by Purdy and Decker (1986).

Results of the second and final phase of this study are reported herein. The 5-year examination relates hunting initiation, continuation and desertion to specific social and psychological influences on these behaviors. Implications for future hunter program efforts in New York are discussed.

METHODS

The emphasis of data collection was to obtain a continuous "record" of hunting participation, including desertion, for a group of graduates of the 1983 HTC. Therefore, respondents to the initial 1985 survey were resurveyed. The resurvey occurred following the 1987-88 New York hunting season, the fifth full hunting season during which the 1983 HTC graduates had the opportunity to participate since completing the HTC.

The kinds of influences on hunting participation analyzed in this study are not limited by geographic boundaries, but we focus exclusively on New York State. Therefore, based on annual updates of the mailing list, approximately 8% of the 2,881 respondents to the initial survey were omitted from the panel prior to the resurvey due to emigration from New York State.

As in the initial survey, a self-administered, mail-back questionnaire was used to collect data for the resurvey. The survey, with up to 3 reminder notices, was conducted over a 5-week period in May-June 1988.

Data Analysis

Analysis of data from this study was conducted using the SPSSX statistical package (SPSS, Inc. 1986). Statistical comparisons were made using Chi-square tests for comparisons of categorical data and Student's t-

tests for comparisons of normally-distributed data. All tests were made at the $p \leq 0.05$ level of significance.

RESULTS

Preface to the Analyses

The hypotheses developed in the first study are reexamined in this section using the new data set. The hypotheses are couched as questions, and results pertinent to each question are then presented, thereby forming organizational subsections. Detailed information regarding the relevance of investigating the specific hunting-related issues involved in this study were presented by Purdy and Decker (1986) and will not be repeated in detail. You are encouraged to review the earlier report.

Survey Response/Nonresponse

Completed questionnaires were returned by 52% (1,255) of the 1983 HTC graduates to whom questionnaires were delivered in the resurvey (there were 220 undeliverable questionnaires). Thus, efforts to maximize response rates, including numerous appeals to nonrespondents and response incentives (see Purdy and Decker 1986), resulted in continuous records of hunting-related behavior for about 25% of the original sample of 1983 HTC graduates. As with all surveys, potential bias of the results caused by nonresponse is a concern.

In this study, we elected not to conduct formal nonresponse follow-up surveys[2] for 2 primary reasons.

First, the principal purpose of this study is to improve understanding of the relationships between social/psychological influences and hunting participation, not to generalize about the degree to which people with these influences exist among all 1983 HTC graduates. We anticipated considerable panel "attrition," so we began the study with a sufficiently large sample size to ensure that the ability to test the hypotheses would not be impeded. The response obtained in the resurvey was more than adequate for testing those hypotheses.

The second reason for omitting nonresponse follow-up surveys was related to decisions about allocating limited funds for the study. In the first survey, funds that might have been used to assess nonresponse were committed instead to providing incentives to enhance response. In most surveys, nonrespondents are usually those with less interest and personal involvement in the survey topic. However, based on limited assessments of nonresponse effects and comparisons with data from a study of 1978 HTC graduates (Purdy et al. 1985), we believe that such bias may be minimal.

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[2]Limited nonresponse tests were conducted after both the initial 1985 survey and the 1988 resurvey using information common to both respondents and nonrespondents. For the initial (1985) survey, nonresponse assessments were made using data from HTC enrollment records. Data from questions repeated on the questionnaires used in the initial and resurvey parts of the study were used for nonresponse assessments after the 1988 resurvey.

Questions and Discussion

What were the hunting license purchase patterns of survey respondents during the 5 years following completion of the 1983 New York HTC?

About 88% of respondents had purchased at least 1 hunting license by Year 5 (1987-88). Nearly half (47%) bought a license each year. However, not more than 80% purchased a license in any given year. That peak, occurring in Year 3 (1985-86), was likely influenced by the number of young HTC graduates who had reached 16 years of age and therefore were legally eligible both to hunt unsupervised and to hunt big game as "adult" license holders. Over the 5-year period, the greatest net change in buyers occurred from Year 2 to Year 5 (a decrease of about 17%). Purdy et al. (1985) reported similar trends for graduates of New York's 1978 HTC (Figure 1).

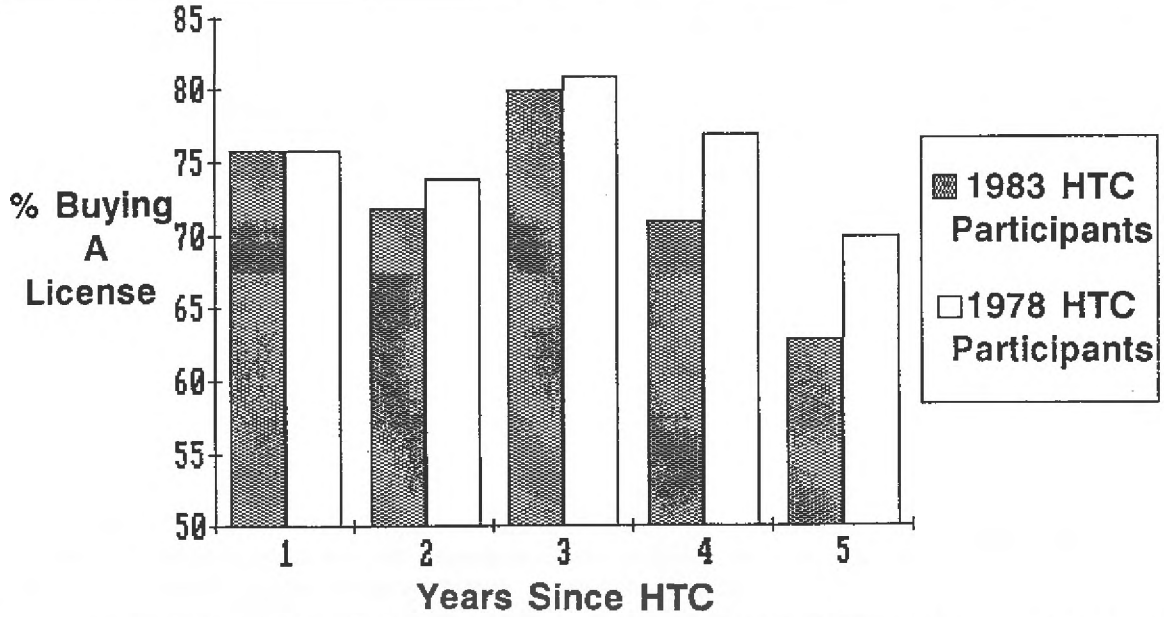

Figure 1. License-buying behavior for two cohorts during 5 years following HTC participation (data for 1978 HTC participants obtained from Purdy et al. 1985).

About half of those who did not purchase a license during Year 1 (1983-84) never bought a license through Year 5, and could be considered nonhunters. Among the remainder of those who did not buy a license during Year 1, the majority bought ≤3 hunting licenses in the 4 subsequent years. Three-fourths of respondents who did not buy a license within the first 2 years never bought a license. On the other hand, over 60% of those who purchased a license in Year 1 purchased a license each succeeding year.

What changes occurred in hunting effort and involvement between Years 1-5 and what reasons were associated with the changes?

Over half (55%) of all respondents indicated that their level of hunting activity had decreased during Years 3-5. Although the reasons for the decrease in activity were numerous, only a few were of significance: (a) insufficient time for hunting (35%); (b) movement from a previous area of residence (for educational/occupational pursuits resulting in loss of familiarity with hunting areas, loss of hunting companions, and new commitments for use of time) (17%); and (c) personal dislike of killing game (10%). Reasons cited less frequently included a general loss of interest or transfer of interest to another recreational activity (7%), a decline in physical ability to hunt (5%), and the inability to hunt with preferred companions (4%). As observed in earlier studies, few reasons for declining hunting activity pertained directly to management of wildlife populations or provision of hunting opportunities.

To assess the relationships among the reasons for declining hunting involvement, we subjected the data to factor analysis using a principal

components extraction to account for the variation in response. The patterns of response among the 23 individual reasons formed 9 groups or "dimensions" of reasons (Table 1). The range of reasons illustrate the emphasis on aspects of hunter behavior, personal feelings about game harvest and consumption, experiences with hunting success, and changes in residence and occupation.

Table 1. Groups of reasons for decreasing hunting activity, identified by factor analysis.

Groups of reasons for decreasing hunting activity		
Hunting Quality * congested hunting areas * danger of hunting * bad experience w/others * restrictive hunting regulations * poor hunter behavior	Personal Feelings * dislike killing * dislike eating game * lost hunting interest	Area Availability * travel distance * few hunting areas
Harvest Success * poor success * scarcity of game	Health/Available Time * poor health * insufficient time * school commitments	Companionship * lack of companions * loss of preferred companion
Social Influence * social disapproval * changed recreational interest	Equipment/Costs * license cost * equipment costs/ availability	Area Displacement * residence change * joined military

Using a measure to select people likely to cease hunting (see discussion on p. 10), we found that people who had reported reasons for declining hunting activity related to personal feelings about game harvest and consumption were more than twice as likely to quit hunting as people with other reasons (43% vs. $\leq$20%, respectively). Generally, the factors most related to potential hunting desertion were social/psychological in nature. Wildlife resource-

related reasons, health, available time, and cost/logistical reasons accounted for some of the decrease in hunting activity, but were seldom associated with strong potential for hunting desertion.

How did HTC participants' reasons for taking the course relate to their hunting participation trends following course graduation?

Respondents who took the HTC primarily to obtain their first New York hunting license (80%) were significantly more likely than others (e.g., who took the course to learn about wildlife and/or hunting or to accompany others taking the HTC) to participate in hunting. Their participation peaked in Year 3 following HTC graduation (due to the age-related reasons identified earlier) and subsequently declined, but their annual rates of participation were at least 10% higher than for other groups (Figure 2).

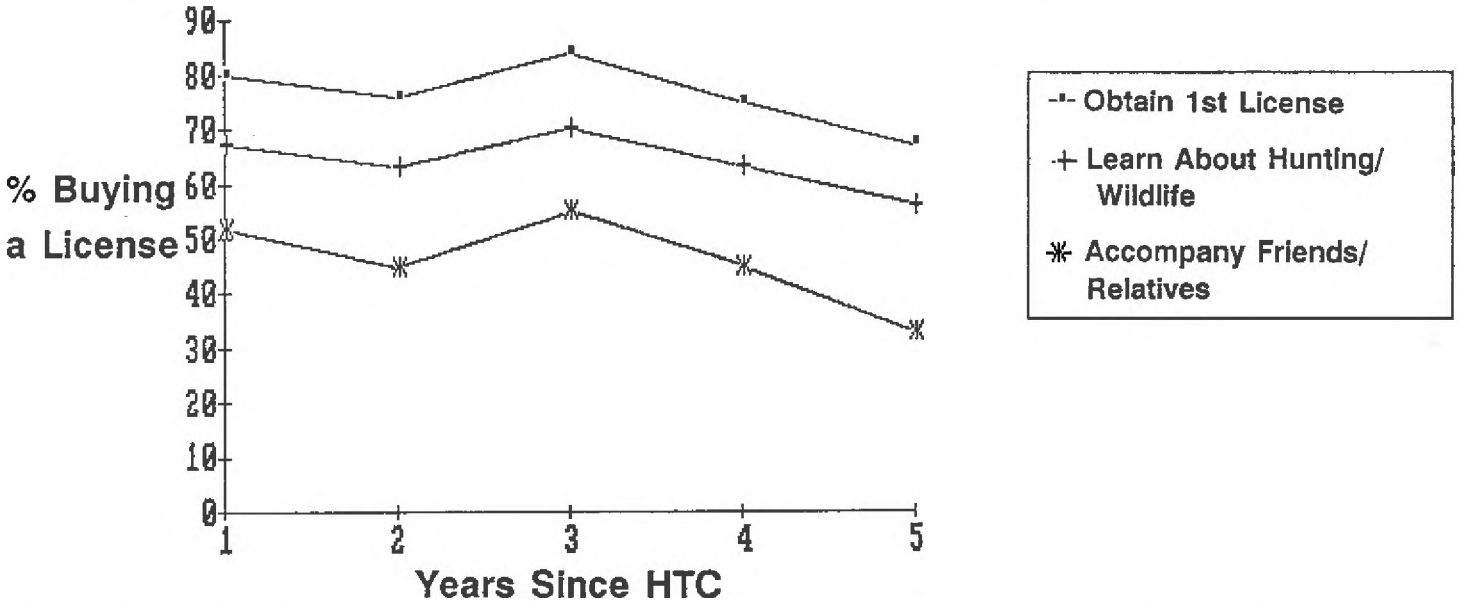

Figure 2. The relationship between reasons for taking the 1983 HTC and the 5-year trend in hunting license purchases.

How did desertion from hunting vary with the stage of hunting adoption attained by respondents following the HTC?

HDRU staff have developed and tested a technique by which individuals self-diagnose their stage of hunting involvement (i.e., hunting activity adoption--see Purdy and Decker 1985, Purdy et al. 1985, Decker and Purdy 1986). The technique helps demonstrate that becoming a hunter is a multistage process of increasing interest characterized by a series of decisions and related behaviors (Figure 3). The adoption process may be influenced by certain experiences and, perhaps, predicted if certain attributes of HTC enrollees are known. The relationship between stage of adoption attained early in one's hunting history and eventual desertion is examined to address the question for this subsection.

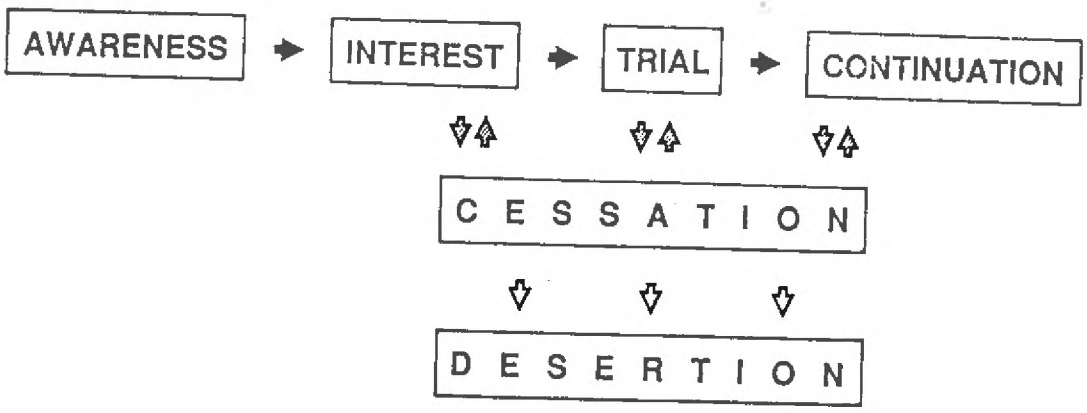

Figure 3. Stages in the development of an individual's interest and involvement in hunting.

The proportion of respondents characterizing their hunting involvement as being in the interest stage following Year 2, and who indicated in 1988 that cessation of hunting had either occurred or was likely to occur was nearly double that of any other adoption segment (Table 2). The percentage of

Table 2. Changes in respondents' stage of hunting adoption from Year 2 to Year 5.

	Year 5				
Year 2	Interest	Trial	Continuation	Cessation/ desertion	Total
			%		
Interest	54	20	11	15	100
Trial	0	41	51	8	100
Continuation	0	0	97	3	100
Cessation/ desertion	21	9	23	47	100

hunting "deserters" from these other segments, however, was small (i.e., ≤15%); only 3% of those classified as being in the continuation stage in Year 2 were reported to be likely "deserters" in Year 5. Those 1983 HTC graduates who had not advanced beyond the interest stage within 2 years were significantly less likely to have attained a higher stage (i.e., trial or continuation) by Year 5 than graduates who had achieved the trial stage by Year 2 (31% vs. 51%).

Although about 12% of the respondents had not purchased a license over the 5-year period, only 7% indicated that desertion from hunting had either occurred or was likely to occur. Were persons comprising the 5% difference "deserters?" Behaviorally, perhaps, but possibly not in their self-

perception. As shown in Table 2, over half of the people who indicated in Year 2 they would cease hunting were in a stage of adoption in Year 5 that reflected actual or potential involvement.

Surprisingly, about 6% of respondents who had identified themselves as being in the trial stage and 18% of those in the continuation stage in Year 2 (or 12% overall) indicated in Year 5 that they were in a less advanced stage of hunting adoption--theoretically an impossibility given the behavioral criteria used in the measure to place people in a given stage. As a result, we omitted these anomalies from this analysis. A possible explanation for such recidivism in the respondents' identification of their stage of hunting adoption is that some may have classified their involvement in Year 2 as being the level or degree they believed they would attain, not that actually achieved by that time. Because perceptions are influenced by personal experience, the opportunity provided by the follow-up survey in Year 5 would have allowed them to reflect upon an additional 3 years of unattained involvement. Thus, their subsequent reclassification of their Year 5 hunting-adoption stage would likely be a more accurate reflection of their self-perceived involvement than that reported in Year 2. In any event, for this analysis we can safely assume that the individuals involved in this mix up were not "committed" hunters by Year 5.

What was the relationship between individuals' age at initiation to hunting and the process of hunting adoption?

Involvement in hunting prior to age 16, the legal age at which a person can hunt without adult accompaniment in New York, appears to enhance the probability of becoming a committed hunter. About 80% of respondents who took

the HTC in 1983 at 15 years of age or younger identified themselves as continuing hunters in Year 5, compared to slightly more than half of those who took the HTC at older ages. Also, desertion by Year 5 was nearly twice as likely for persons who took the course at 16 years of age or older than for those who were younger (9% vs. 5%).

The significant aspect of the relationship identified above lies in the extent to which it reflects the context for recruitment. That is, the specific age at which people become involved with hunting is important when we simultaneously consider <u>who</u> introduces them and <u>how</u> they are introduced. Introduction to hunting typically begins when individuals are exposed to, and take an interest in, other people for whom hunting is an important recreational activity. Such people, if effective role models, can stimulate hunting interest and help others assimilate hunting values via shared experiences. Those experiences, insofar as they are instrumental in the process of hunting adoption, have been termed "key events" (Purdy and Decker 1986). Exposure to such events often occurs in a situation that Decker et al. (1986b) have referred to as an "apprenticeship" period. In the first survey report we discussed apprenticeship from the perspective of a chronology of several key-event experiences. Among the most important of these was that of gaining hunting experience by accompanying other hunters afield. In this study, we have attempted to learn more about "apprenticeship" and key-event experiences, and their importance to long-term hunting involvement, as discussed below.

What differences in hunting participation were observed between hunting recruits who had experienced several hunting key events during an earlier apprenticeship period and those who had no such experience?

Few people in the 1983 HTC did not have broad exposure to hunting-related experiences, including actual field experience. Apprenticeship experiences were strongly related to the early development of commitment to hunting. Generally, the older the HTC participant, the less likely he or she was to have had prior involvement in hunting key events. Relatively few youngsters coming to the HTC lacked the role models and key-event experiences that tend to enhance their commitment to and participation in hunting; virtually all had family backgrounds where hunting was an important activity. Older HTC participants (i.e., late teens and beyond), for whom hunting backgrounds were less common, were found to be less committed to hunting. Respondents who lacked apprenticeship experiences prior to or shortly after the HTC were significantly less likely (usually by a margin of 2:1) to participate in hunting during each of Years 1-5. Among people having apprenticeship experience, those who took the HTC at $\leq$13 years of age (i.e., just prior to their first opportunity to hunt under adult supervision) were more likely than their older counterparts to hunt following the course. These youngsters were more likely than older individuals to come from families with hunting traditions.

What was the relationship between the key hunting event of "accompanying other hunters afield before hunting recruitment" and post-HTC hunting participation?

Over the 5-year period of this study, new hunters who had not accompanied other hunters afield by Year 2 (1985) were one-third as likely to have reached the continuation stage of hunting adoption by Year 5 (1988) and by about the same margin were more likely to discontinue hunting altogether (Figure 4). However, only about 9% of the people taking the HTC did not have

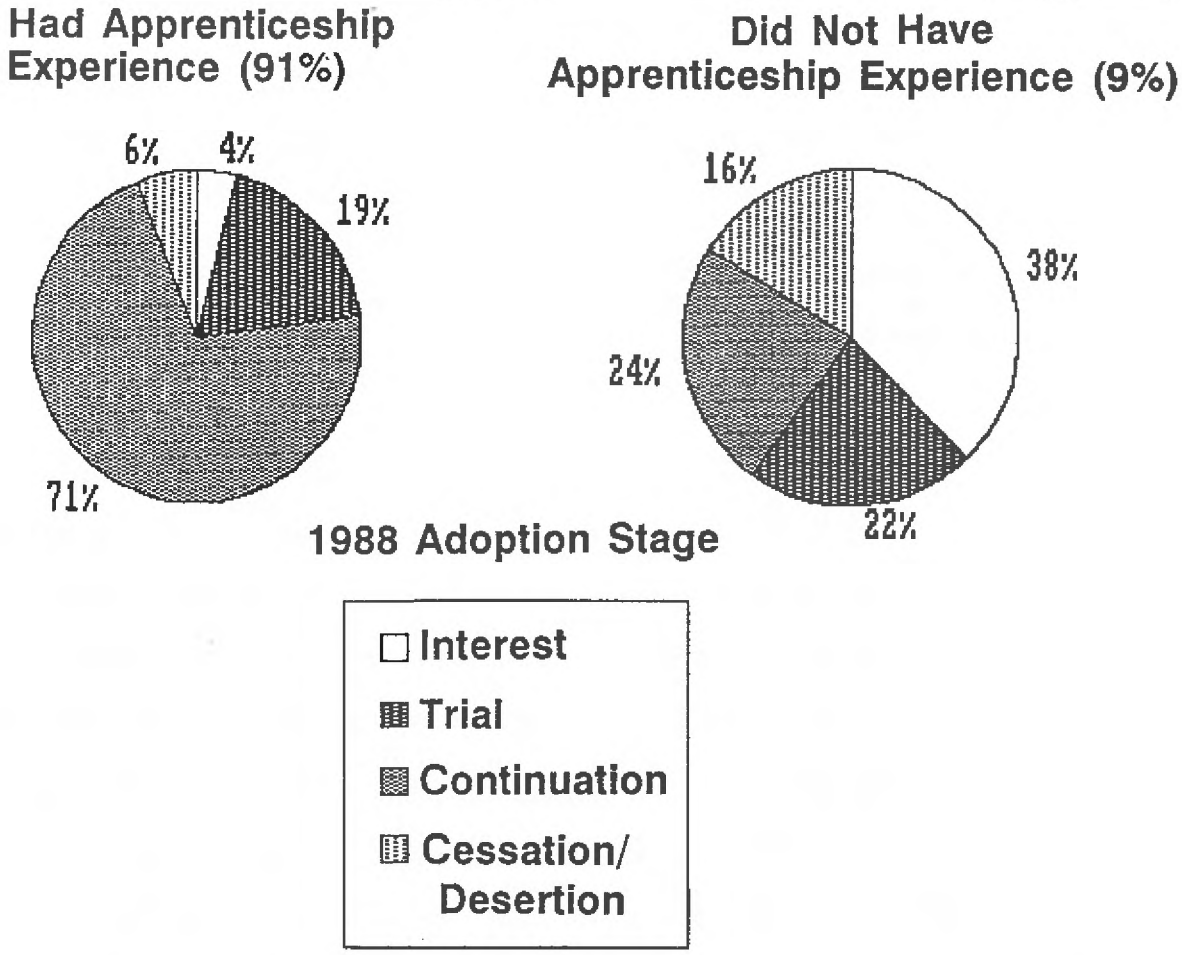

Figure 4. Relationship of respondents' 1988 stage of hunting adoption to apprenticeship field experience or "trial hunt."

such a field experience by the time of, or shortly after the course. Thus, few new hunters made decisions about adopting hunting without first having participated in the activity (even though a firearm may not have been carried).

The age at which new hunters first accompanied other hunters afield (i.e., gain field experience) did not differ between persons who deserted hunting and those who did not. However, among those who did not cease hunting activity, the age of that first field experience was a good indicator of self-perceived "committed" hunters. Respondents who first accompanied others afield at 15 years of age or younger were more likely than their older counterparts to identify themselves as being in the continuation stage of adoption (76% vs. 52%), reflecting the greatest involvement with the activity.

What actions did the HTC graduates take to become role models for prospective new hunters--who did they introduce to hunting and how?

About 35% of the respondents indicated that since their recruitment to hunting in 1983, they had introduced others to the activity. Half the persons they introduced to hunting were male friends and 25% were family members, excluding their own children. About 10% had introduced their own children to hunting since HTC graduation; 8% = son(s) and 2% = daughter(s). The hunting experiences respondents provided for the people they introduced to hunting usually involved events similar to ones they had experienced during their own early introduction to hunting. These included the sharing of hunting experiences through conversation, actual field experience, shooting and firearms safety instruction, and discussions of wildlife and their habits.

About 70% of respondents whose apprenticeship included actual field experience themselves chose to introduce newcomers to hunting in this way. Respondents who did not obtain field experience during their own initiation were significantly less likely to have included such experiences as part of their interaction with initiates.

What were the effects of respondents' social influences for hunting on their post-HTC involvement in the activity?

The development of an individual's interest in, and commitment to, recreational hunting occurs largely due to social influences and associated experiences. Other people, not magazines, TV shows, or other forms of communication, recruit new hunters. Previous research has shown that 2 groups primarily influence hunting initiation decisions: family members and friends. People introduced to hunting in families where hunting is important and culturally-rooted usually begin hunting at early ages under the tutelage of a parent. Following their own recruitment, they typically exhibit a strong commitment to hunting. People recruited into hunting primarily by friends usually begin hunting at older ages, may be more interested in hunting to maintain affiliative ties with friends, and appear less committed to long-term hunting participation.

Four out of five 1983 HTC participants believed they had virtually unanimous approval by all people they considered to be influencers of their decision to participate in hunting. People with support for initiating hunting from both family and friends were significantly more likely to have reached advanced stages of hunting adoption (i.e., continuation) by Year 5 (1988) than were those who reported any type of discouragement. Among those

who began hunting with little or no support from others who were socially important, about 40% had not advanced beyond the trial stage of adoption and about 15% had quit or intended to quit hunting. Furthermore, even among people with strong social approval for hunting, those who were supported by family were more likely than those who were supported only by peers to maintain greater levels of hunting participation; throughout the study period, the mean days of hunting activity were significantly greater for family-influenced persons than for those who were peer-influenced (Figure 5).

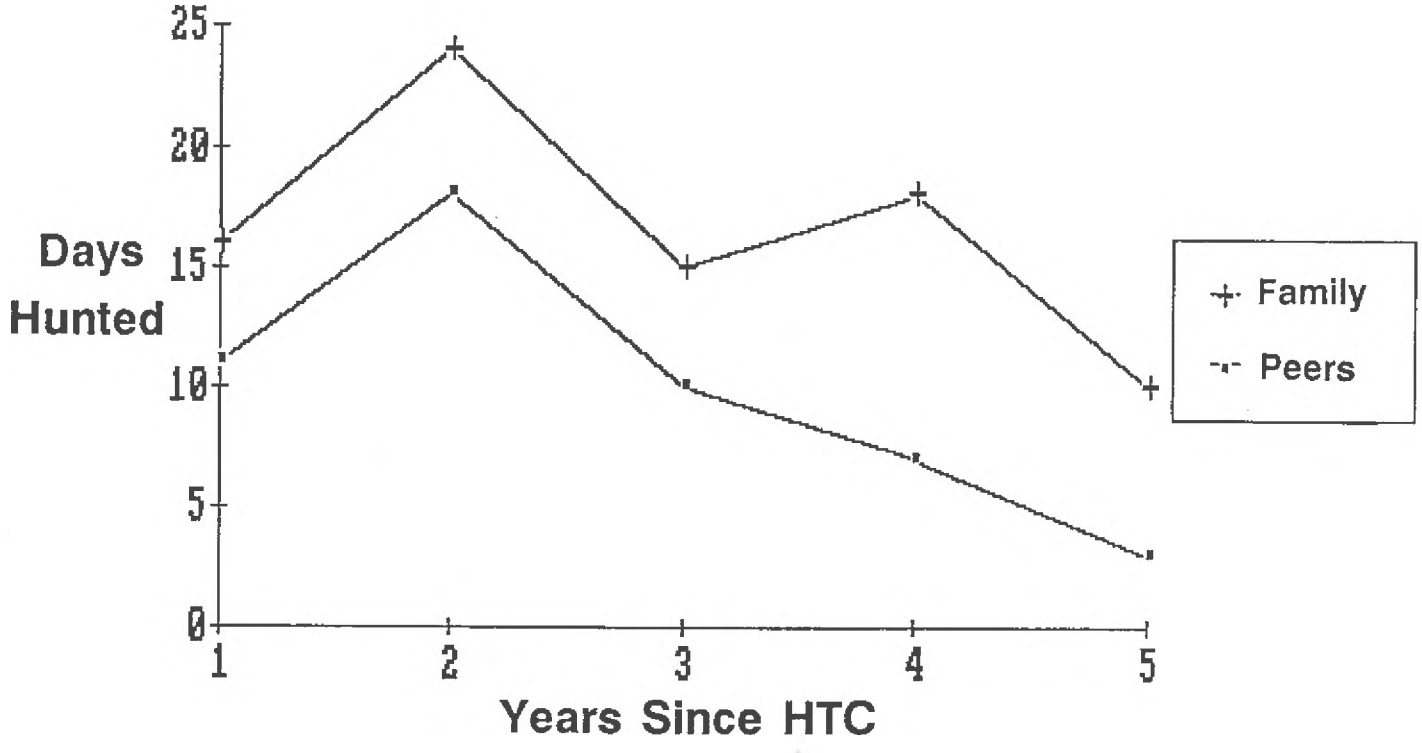

Figure 5. Relationship of total days hunted each hunting license year since the HTC to source of positive influence for initiating hunting.

Did respondents' choice of hunting companions change after graduation from the HTC?

Companionship was an important component of respondents' hunting experiences. About 90% hunted most frequently with other individuals, not alone. A majority had never hunted alone. Fathers and male friends were the most frequent hunting companions of respondents during Years 1 and 2. By Year 5, fewer individuals were accompanied by their fathers than shortly after the course, but that hunting relationship remained foremost for about 63% of those listing their father as the most frequent companion in Years 1 and 2. Male friends, other family members and, for about 1-in-10 people, spouses were also reported to be important hunting companions by Year 5. Generally, fairly strong affiliative ties were observed between companions over the period of this study. Among the hunting relationships that appeared most strong was that between spouses; nearly 80% who hunted together after graduating from the HTC were still hunting together 5 years later.

What motivational orientations were most important to new hunters and how did those orientations change over the 5-year period of the study?

Evaluations of satisfactions obtained from hunting, as indicators of individuals' reasons for hunting, have led to the development of a typology of 3 hunting motivations (Decker et al. 1984): (1) <u>achievement-motivated hunters</u>--persons who hunt primarily to meet a self-determined standard of performance such as bagging a quota of game; (2) <u>affiliative-motivated hunters</u>--persons who hunt primarily to accompany others afield, thereby

maintaining or strengthening personal relationships; and (3) appreciative-motivated hunters--persons who hunt primarily to obtain that sense of peace, belonging and familiarity they have learned to associate with the hunt. Although an individual may exhibit some combination of these motivations, Decker et al. (1984) suggested that for most hunters a single type will be most influential. That type may be thought of as one's "primary motivational orientation" towards hunting. The authors further proposed that among active hunters, the primary motivational orientation will shift over time from one that is primarily achievement or affiliative in nature to a more appreciative orientation, with the latter being more conducive to long-term hunting involvement and participation.

The initial survey indicated that, contrary to the hypothesized relationship, appreciative motivations were more important than achievement or affiliative motivations as influences for hunting. Achievement as well as affiliative motivations were, however, of relatively lesser importance to older new hunters than to younger ones, suggesting that the importance of appreciative motivations may be linked to hunter maturity. Achievement-oriented hunters were more likely to participate in small game hunting (a finding consistent with the relatively high probabilities of hunting success associated with the activity). Contrary to some popular notions, data from both Years 2 and 5 indicated women were no more likely than men to be motivated to hunt primarily for affiliative reasons.

Overall, appreciative motivations for hunting had, as expected, become more prevalent among respondents in Year 5 (1988) compared to Year 2 (1985)--about two-thirds reported primary appreciative motivations for hunting in 1988 whereas affiliative and achievement orientations were reported to be most

important by fewer hunters (23% and 10%, respectively). Most people who reported in Year 2 that their primary motivations for hunting were either achievement or affiliative oriented had changed by Year 5 to an appreciative orientation (Figure 6). However, the changes in motivational orientations

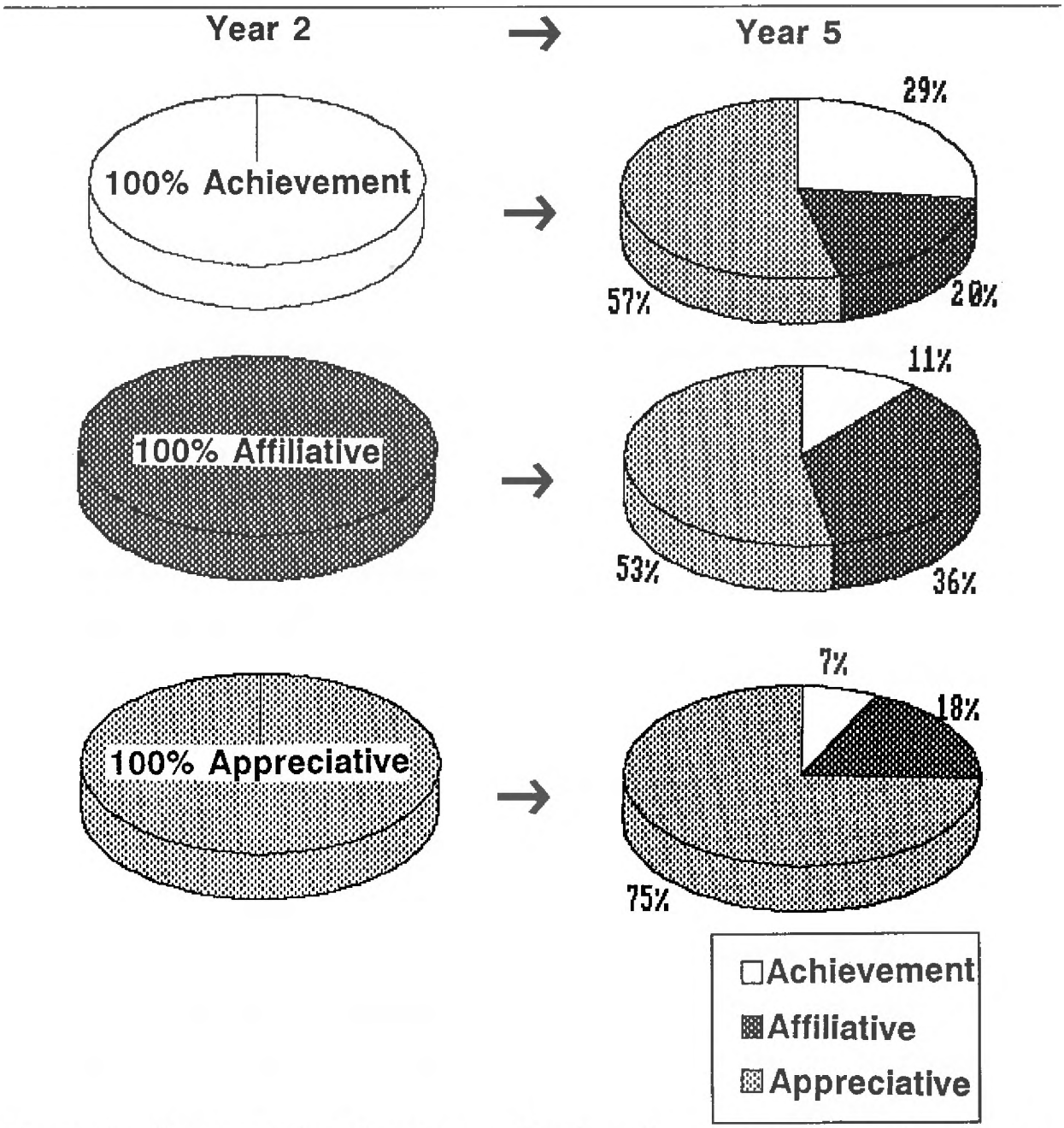

Figure 6. How respondents' primary motivational orientations for hunting in Year 2 had changed by Year 5.

were not strictly unidirectional; about one-fourth of the respondents reporting appreciative motivations in Year 2 indicated that affiliative or achievement orientations were predominant in Year 5. As suggested, motivational orientations for hunting are not fixed, but are changing, dynamic aspects of hunting involvement. Contrary to our earlier analyses, we found no difference in hunters' motivations in Year 5 according to earlier experiences with hunting key events.

IMPLICATIONS AND RECOMMENDATIONS

This report presented a 5-year chronology of hunting involvement for a group of people who graduated from a hunter training course in New York State in 1983. Numerous relationships between hunting involvement and specific attitudinal, social, and demographic factors were reported. Based on the results of this and other research we believe these factors to be important and enduring influences on hunting participation--from initiation through continuation or desertion. Wildlife managers who understand these influences and their effects are in a better position to develop hunter programs that may enhance hunting participation.

When viewed as a dynamic population, hunters, and ultimately the activity of hunting itself, are dependent upon sufficient recruitment and longevity to maintain vitality. As Applegate (1977) has discussed, the probability of an individual's recruitment is a function of intensity of exposure and is strongly related to the degree to which hunting is culturally-rooted in his/her relevant social environment. Lasting commitment to the activity will depend largely on the degree to which recruits accept and identify with the roles, values, and norms of social groups that are part of the hunter population (Buchanan 1985).

Traditionally, the hunting population has depended upon recruitment of men from generation to generation, within a social unit where hunting is an important part of the culture. By and large, that culture has been nurtured in rural areas. We doubt that such cultural-geographic factors will decrease in importance for hunting. As observed in this study, most persons recruited to hunting from such backgrounds are part of a self-perpetuating system, where hunting is likely to continue to be an important recreational activity. These recruits initiate hunting at early ages, have strong role models and reinforcement for participation, and have been provided the experiences prior to recruitment that are necessary to enhance hunting involvement. Their identities as hunters are strong and their levels of involvement and participation after recruitment reflect this.

Although management efforts to enhance levels of participation and satisfaction among these "traditional" hunters may be warranted, perhaps a more critical concern from a population attrition perspective is the segment of hunters who lack the kinds of influences for participation and continued involvement described above. Many may initiate hunting only to desert from the activity after experiencing unmet expectations, a loss of social reinforcement, shift of interest to other activities or time commitments, or other influences. Retention of these people may improve if programs are based on a thorough understanding of the reasons people become involved with hunting, the influences that sustain their involvement, and the factors that lead to cessation of hunting. Opportunities to provide for unmet needs and to counteract possible disincentives for participation should be explored and the effectiveness of the approaches must be evaluated. Efforts to enhance hunting participation and reduce desertion certainly will not yield results quickly.

Recent efforts in New York to develop and test a program to mitigate impediments to youth participation in hunting (Enck et al. 1988) are addressing one element of this concern.

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