

FACTORS RELATED TO HUNTING AND FISHING PARTICIPATION AMONG THE NATION'S YOUTH

PHASE I: A REVIEW OF THE LITERATURE



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PHASE I: LITERATURE REVIEW



Produced under Federal Aid in Sport Fish and Wildlife Restoration
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The views contained in this report do not necessarily represent the views of the U. S. Fish and Wildlife Service.

Although numerous people assisted with this project, any errors, omissions, or typographical mistakes in the reports are the sole responsibility of Responsive Management.

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Introduction

The future of hunting and fishing in the United States ultimately depends upon the commitment of future generations to these traditional fish and wildlife activities. The key to active participation in and commitment to hunting and fishing of future generations is fostering this commitment and participation among today's youth.

Research clearly indicates that active participation in hunting and fishing as an adult is directly related to active participation as a youth. More than 90% of today's adult hunters were initiated into hunting before the age of 20 (Duda and Young 1993). In fact, if an individual has not learned to hunt by the age of 20, there is a very low likelihood of hunting participation as an adult (Duda and Young 1993). Among today's anglers, 85% started fishing before the age of 12, while a full 92% started before the age of 17 (Responsive Management 1996a). Additionally, research shows that not only is active participation by an adult determined by early exposure to hunting and fishing, but the level of adult avidity is also determined by level of exposure as a child (Duda and Young 1993). Those who participate frequently as a child are more likely to avidly participate as an adult. Conversely those who start hunting and fishing later in life hunt and fish less as an adult and are more likely to cease hunting and fishing altogether (Duda et al. 1998). Clearly, exposure to these activities as a child is critical to participation as an adult. In addition, participation by adults is critical to the youth of the next generation, continuing the cycle of hunting and fishing recruitment and retention within the U.S. population.

The purpose of this study is to better understand the factors related to hunting and fishing initiation, participation, retention, and desertion among U.S. youth 8-18 years old. There are two major objectives of this study. The first objective is to identify the factors involved in the recruitment and retention of the nation's youth to hunting and fishing through primary and secondary research. The second objective is to recommend to the fish and wildlife management community programs and strategies that have the best chance of success in the recruitment and retention of the nation's youth in hunting and fishing participation based on the research findings.

Although there has been a proliferation in the number of studies on hunting and fishing participation in the past decade, almost all of this work has focused on adult participation. This project will focus on where hunting and fishing initiation and retention begin: with the nation's youth.

There are five phases to this project. Phase I consisted of a literature review of not only what is known about youth and hunting and fishing participation, but also what is known about youth participation in other activities, demographic trends affecting youth, and children's cognitive development and stages of learning. Phase II consisted of a series of focus groups of youth of various ages. Phase III consisted of a telephone survey of the nation's youth regarding their participation in and opinions on hunting and fishing and other outdoor activities as well as their attitudes toward wildlife. Phase IV of the project included extensive cross-tabulations of the telephone survey data. Phase V is the final report. The final report will be a concise and easy-to-read document that not only outlines the factors related to the specifics of youth hunting and fishing initiation, participation, retention and desertion, but as importantly will identify specific strategies to increase program and educational efforts to increase hunting and fishing participation among the nation's youth. This report will be based upon the solid foundation of original and secondary research that will be conducted and evaluated in Phases I-IV.

This project was funded under a grant from the U. S. Fish and Wildlife Service, Division of Federal Aid, Federal Aid in Sport Fish and Wildlife Restoration Grant Agreement 91400-01-0010.

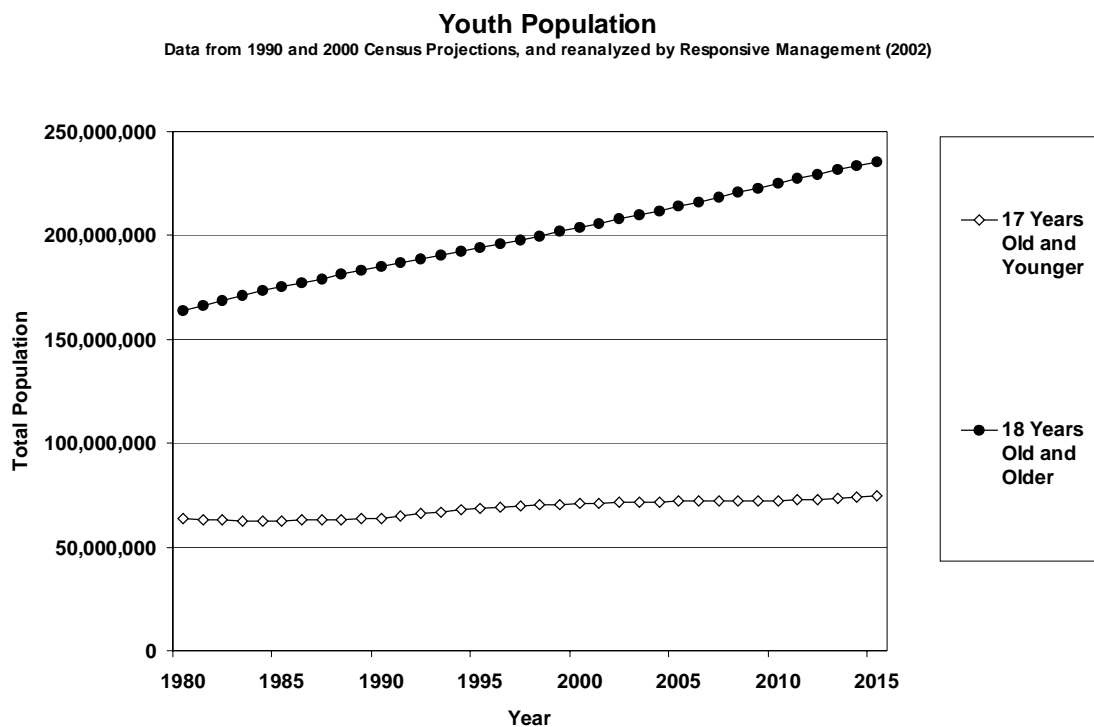
This report is Phase I and includes an overview of the pertinent literature on hunting and fishing, especially as it relates to participation in and attitudes toward these activities among youth. Included in this report is a demographic profile of the nation's youth, a review of children's cognitive development as it pertains to outdoor recreational activities and the natural environment, and youth participation in sports including hunting and fishing. This report also examines satisfaction parameters with hunting and fishing and identifies factors that affect initiation into and desertion from these activities.

Chapter 1: Demographic Profile of the Nation's Youth

This chapter presents an overview of youth demographics in the United States, including age, place of residence, gender, ethnicity, family size, and family earnings. The source of most of the data presented here is the U.S. Bureau of the Census. However, Responsive Management conducted several original data analyses, and they are noted as such. These analyses on urbanicity, gender, ethnicity, relative percentages of children in the population, and finances have been conducted based on the hypothesis that these demographic characteristics may play some role in the rates of participation in many sports, including participation in hunting and fishing.

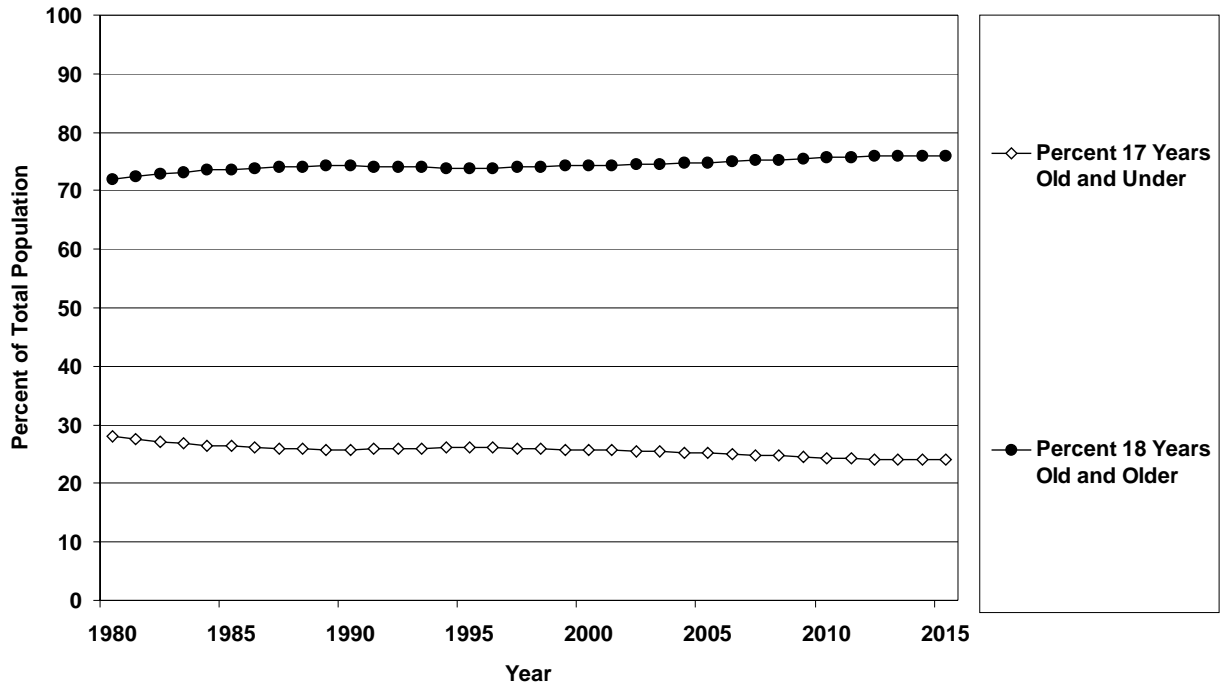
Age

According to the U.S. Census Bureau (U.S. Census Bureau 2002), there are 71,327,611 children 17 years old and younger (age definitions selected to match Sporting Goods Manufacturer Association [SGMA] and National Sporting Goods Association [NSGA] age-related sport participation data; please see Chapter 2 for more on this analysis) in the United States, making up approximately 26% of the population. The number of children in the country has been steadily increasing (see below). However, the rate of increase is much lower than that of the increasing number of adults (those individuals 18 years old and older). Johnson (2000) found this same trend, noting that “the proportion of children in the U.S. population has fallen from 36% (in 1960) to 26% (in 1998) and is expected to drop to approximately 24% in 2020. Youth as a proportion of the total population is clearly declining.

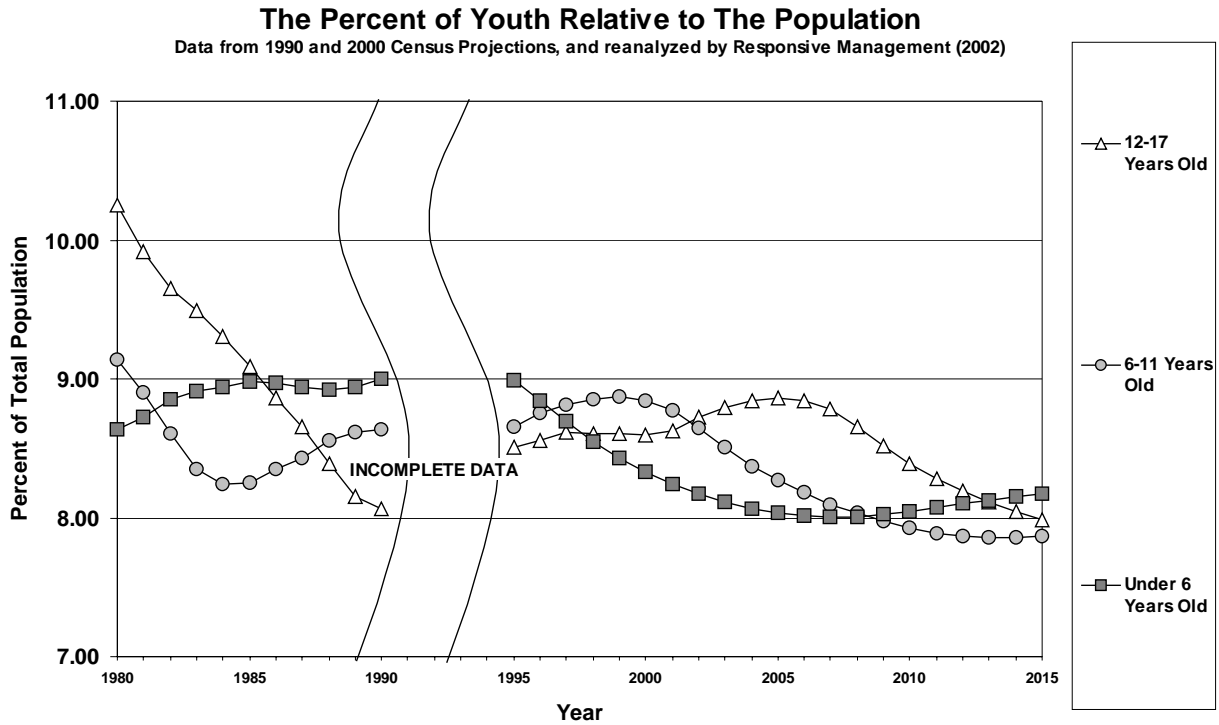


The Percent of Youth Relative to the Population

Data from 1990 and 2000 Census Projections, and reanalyzed by Responsive Management (2002)



From 1980 to 1990, the age group that had the largest decline as a proportion of the total population was the 12-17 age group. However, from 2000 to 2010, those under 12 years of age are expected to show the greatest decline as a proportion of the total population.



Using three methods of examining where these population reductions are occurring, these same data have been plotted using a style of geographical boundary definition used by Bowker, English, and Cordell (1999), and two different styles of Census (U.S. Bureau of Census 2002) geographical boundary definitions. On the following page is a table describing the categorization of the states under each of the three classification methods.

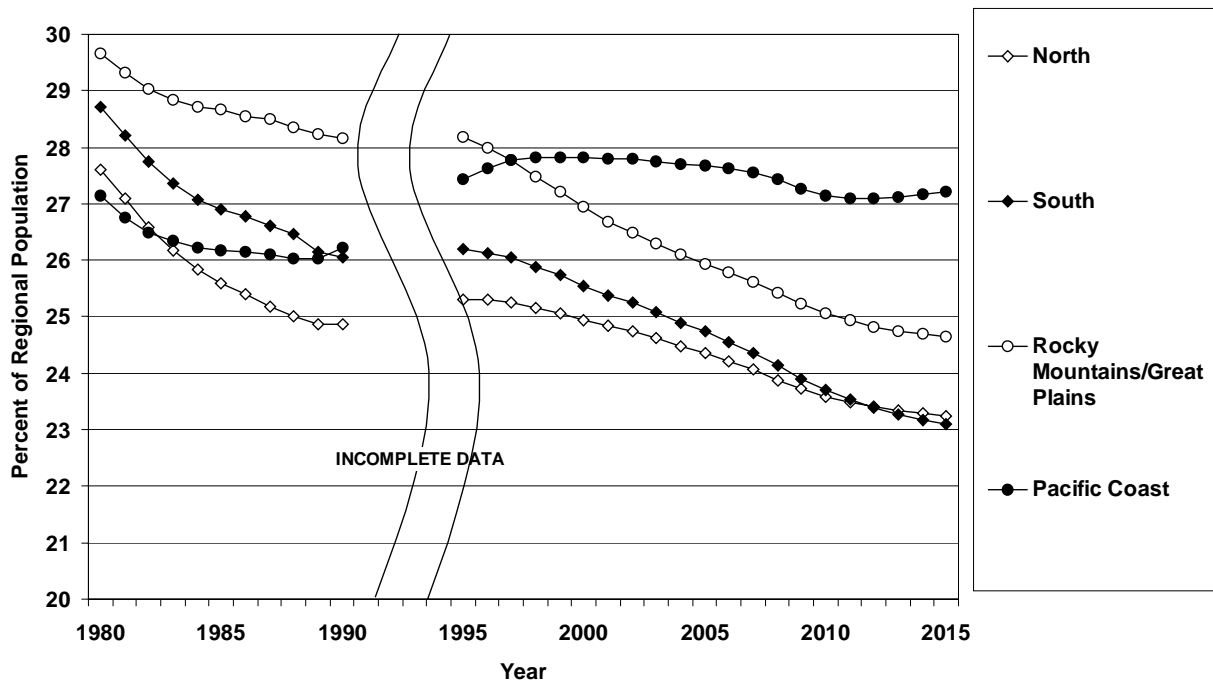
State	Bowker, English, & Cordell (1999) Regions	Census Regions I	Census Regions II
AK	Pacific Coast	West	Pacific
AL	South	South	East South Central
AR	South	South	West South Central
AZ	Rocky Mountains/Great Plains	West	Mountain
CA	Pacific Coast	West	Pacific
CO	Rocky Mountains/Great Plains	West	Mountain
CT	North	Northeast	New England
DC	North	South	South Atlantic
DE	North	South	South Atlantic
FL	South	South	South Atlantic
GA	South	South	South Atlantic
HI	Pacific Coast	West	Pacific
IA	North	Midwest	West North Central
ID	Rocky Mountains/Great Plains	West	Mountain
IL	North	Midwest	East North Central
IN	North	Midwest	East North Central
KS	Rocky Mountains/Great Plains	Midwest	West North Central
KY	South	South	East South Central
LA	South	South	West South Central
MA	North	Northeast	New England
MD	North	South	South Atlantic
ME	North	Northeast	New England
MI	North	Midwest	East North Central
MN	North	Midwest	West North Central
MO	North	Midwest	West North Central
MS	South	South	East South Central
MT	Rocky Mountains/Great Plains	West	Mountain
NC	South	South	South Atlantic
ND	Rocky Mountains/Great Plains	Midwest	West North Central
NE	Rocky Mountains/Great Plains	Midwest	West North Central
NH	North	Northeast	New England
NJ	North	Northeast	Middle Atlantic
NM	Rocky Mountains/Great Plains	West	Mountain
NV	Rocky Mountains/Great Plains	West	Mountain
NY	North	Northeast	Middle Atlantic
OH	North	Midwest	East North Central
OK	South	South	West South Central
OR	Pacific Coast	West	Pacific
PA	North	Northeast	Middle Atlantic
RI	North	Northeast	New England
SC	South	South	South Atlantic
SD	Rocky Mountains/Great Plains	Midwest	West North Central
TN	South	South	East South Central
TX	South	South	West South Central
UT	Rocky Mountains/Great Plains	West	Mountain
VA	South	South	South Atlantic

State	Bowker, English, & Cordell (1999) Regions	Census Regions I	Census Regions II
VT	North	Northeast	New England
WA	Pacific Coast	West	Pacific
WI	North	Midwest	East North Central
WV	North	South	South Atlantic
WY	Rocky Mountains/Great Plains	West	Mountain

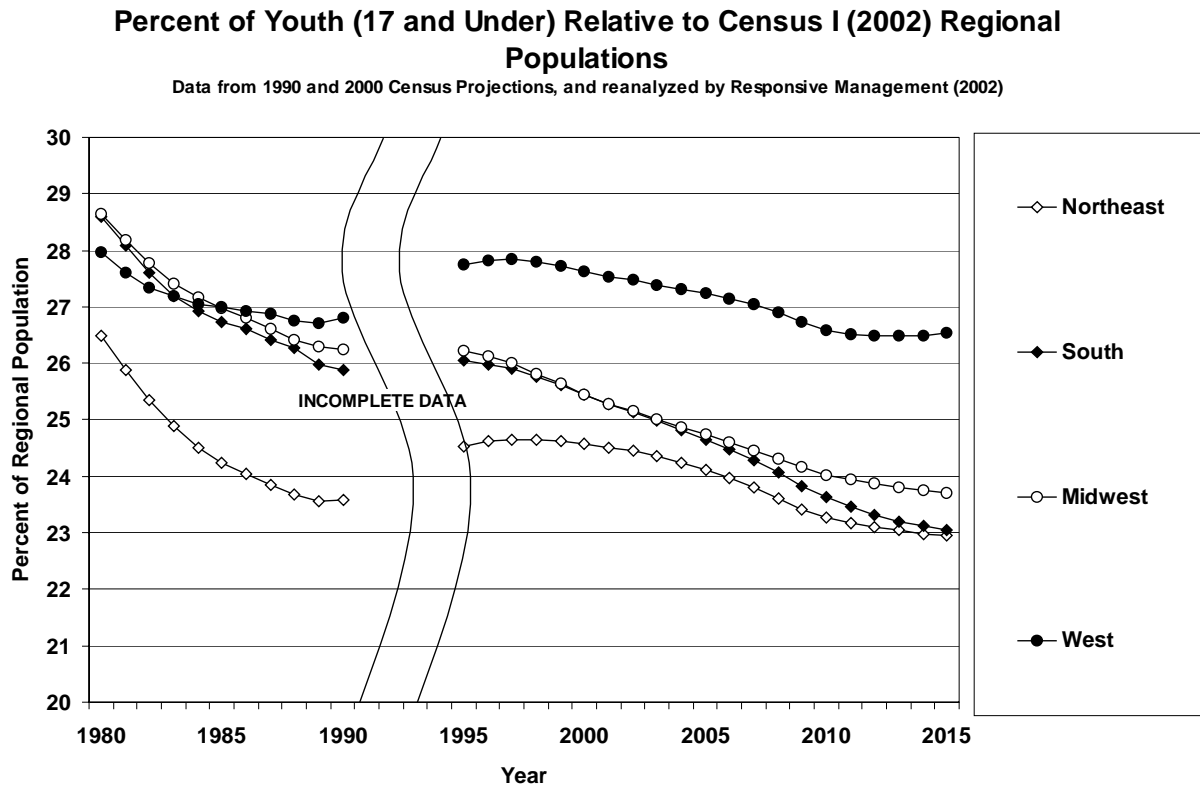
The data below indicate that, using the Bowker, English, and Cordell (1999) method (as shown in the table above), the North and South regions have the steepest rates of decline in their proportion of youth population. The Pacific Coast experienced an upsurge in the percent of children between the 1990s and the present but is predicted to show little change over the next few years.

Percent of Youth (17 and Under) Relative to Bowker, English and Cordell's (1999) Regional Populations

Data from 1990 and 2000 Census Projections, and reanalyzed by Responsive Management (2002)



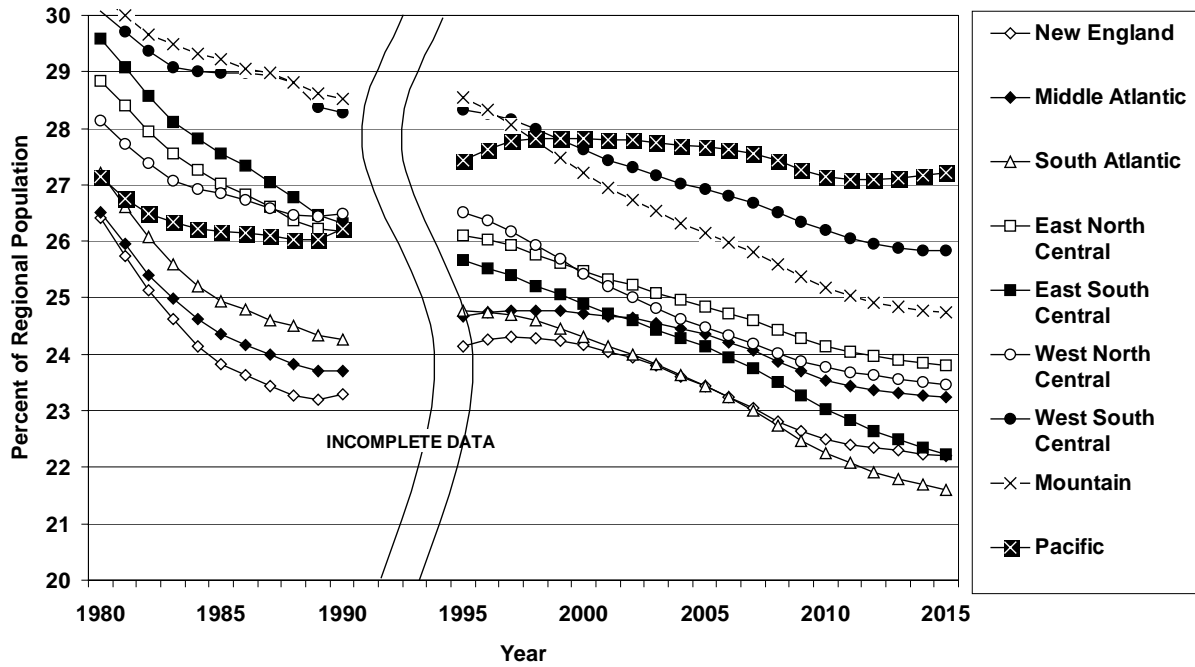
These same data (see below) examined using Census Regions I boundaries (U.S. Census Bureau 2002) also show that the West has the slowest rate of decrease in the percent of youth, but the data also show this same pattern in the Northeast.



Finally, using Census Regions II boundaries (U.S. Census Bureau 2002), the same general pattern is discernable, as seen in the following graph. Rate of youth decline (percent) is slowest in the Pacific region and the West South Central Region, as seen in the following graph.

Percent of Youth (17 and Under) Relative to Census II (2002) Regional Populations

Data from 1990 and 2000 Census Projections, and reanalyzed by Responsive Management (2002)

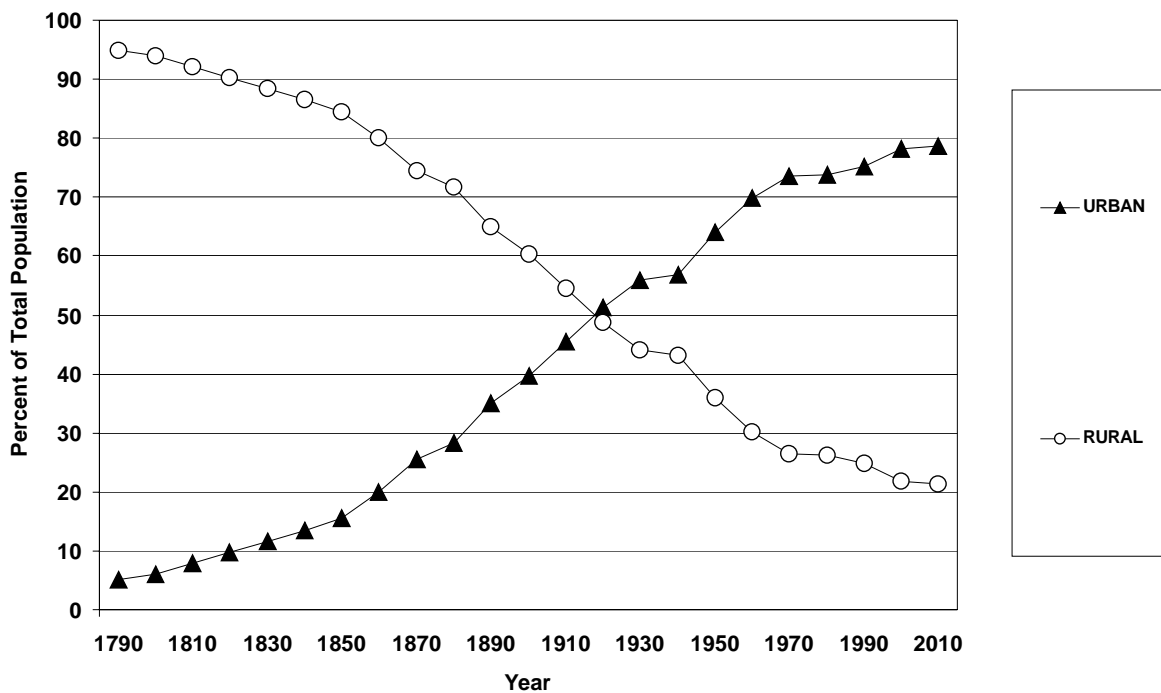


Urban/Rural

The graph below shows historical data from the U.S. Census Bureau (2002) on the percent of the population living in urban and rural housing. These data show a clear pattern of reduced rural housing as a percent of the whole. A segmented linear regression analysis (Pedhazur 1982) interpolated between the 10-year data collection, and the data were smoothed and used to project the data into the future. The percent of the population living in rural housing has declined and will probably continue to decline.

The Percent of Population (All Ages) in Urban Versus Rural Housing

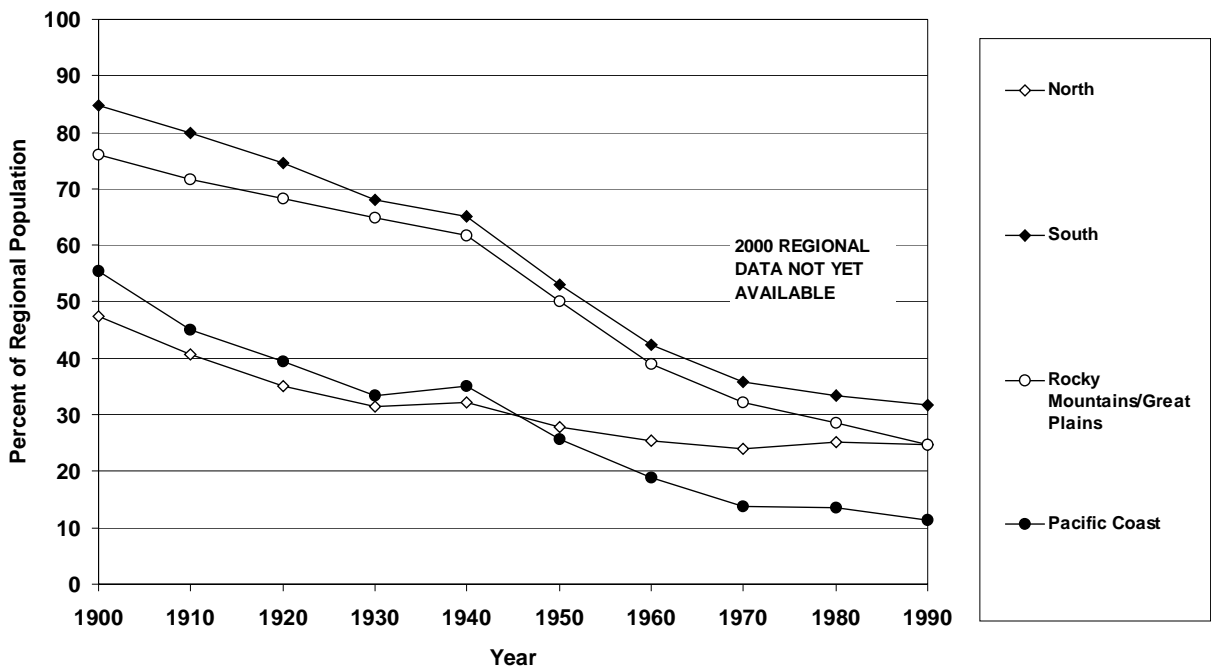
Data from 2002 Census (web)



Below are the data on the percent of people who live in rural housing (all ages) from 1900 to 1990 for each region using the Bowker, English, and Cordell (1999) boundaries. The South shows a rate of decline similar to that of the Rocky Mountains/Great Plains. Even though there are larger percentages of people living in rural areas in both those regions than in the other regions for most of the years examined, the end point in 1990 for the Rocky Mountains/Great Plains region is nearly the same as the end point for the North. In fact, the North appears more stable, with a lower percent of rural dwellers from the beginning, and a slower rate of decline in the percent of rural dwellers.

Percent of Population (All Ages) in Rural Housing Relative to Bowker, English and Cordell's (1999) Regional Populations

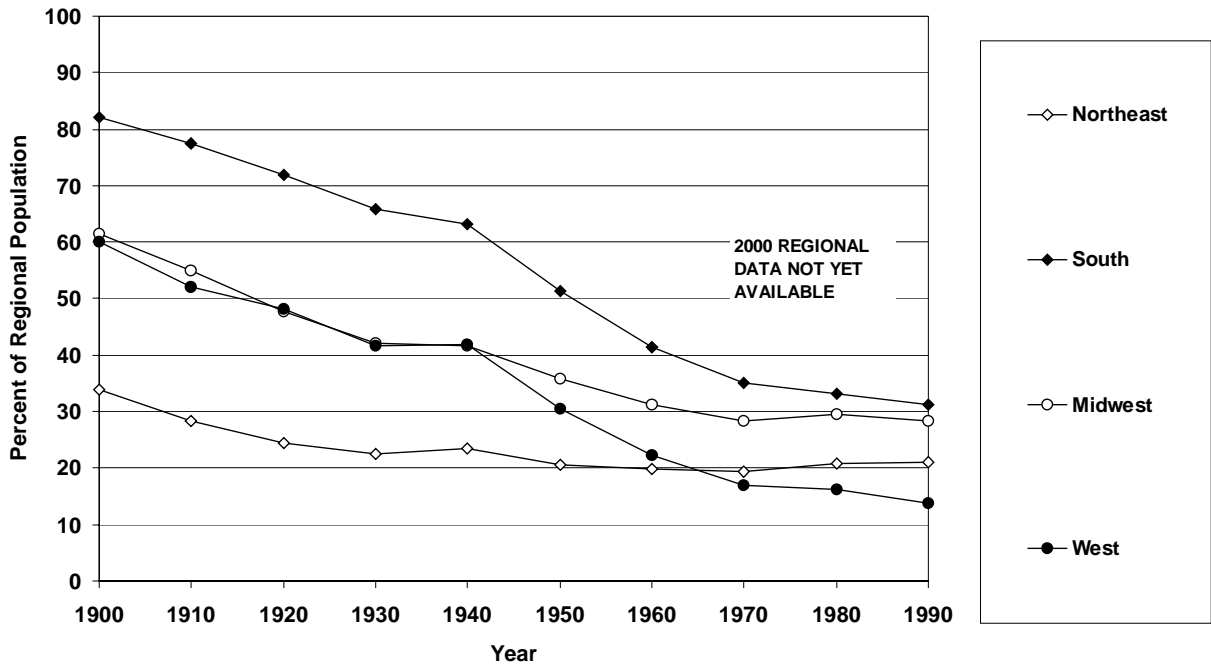
Data from 1990 Census, and reanalyzed by Responsive Management (2002)



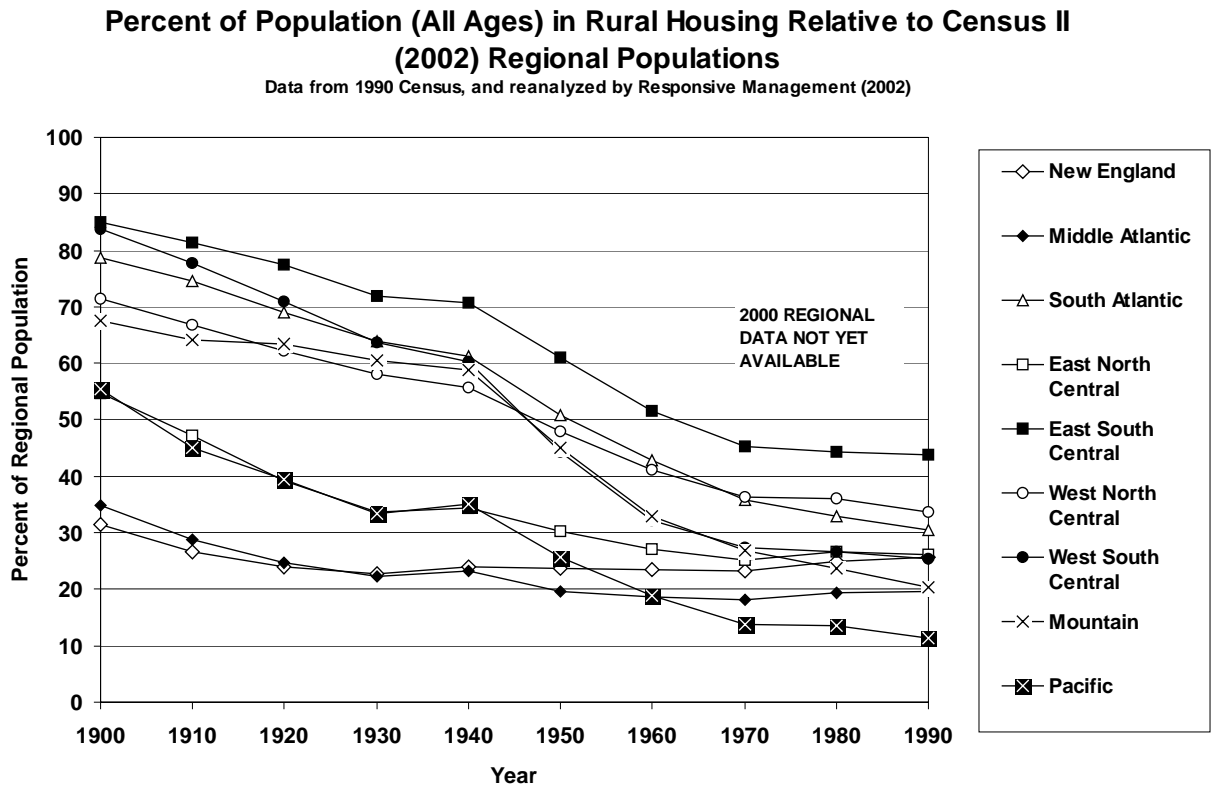
The South and the West have the steepest rates of decline when examining these same data using the U.S. Census I Divisions (U.S. Bureau of Census 2002). However, although the South has the steepest rate of decline, this region still has the highest percentage of rural dwellers in 1990. The Northeast shows the slowest rate of decline, and now has the third highest percentage of rural dwellers.

Percent of Population (All Ages) in Rural Housing Relative to Census I (2002) Regional Populations

Data from 1990 Census, and reanalyzed by Responsive Management (2002)



The U.S. Census II Divisions (U.S. Bureau of Census 2002) boundaries show the East South Central and West North Central Regions with the highest percentage of rural dwellers in 1990, followed by the South Atlantic Region. The New England and the Middle Atlantic Regions had the slowest rates of decline.

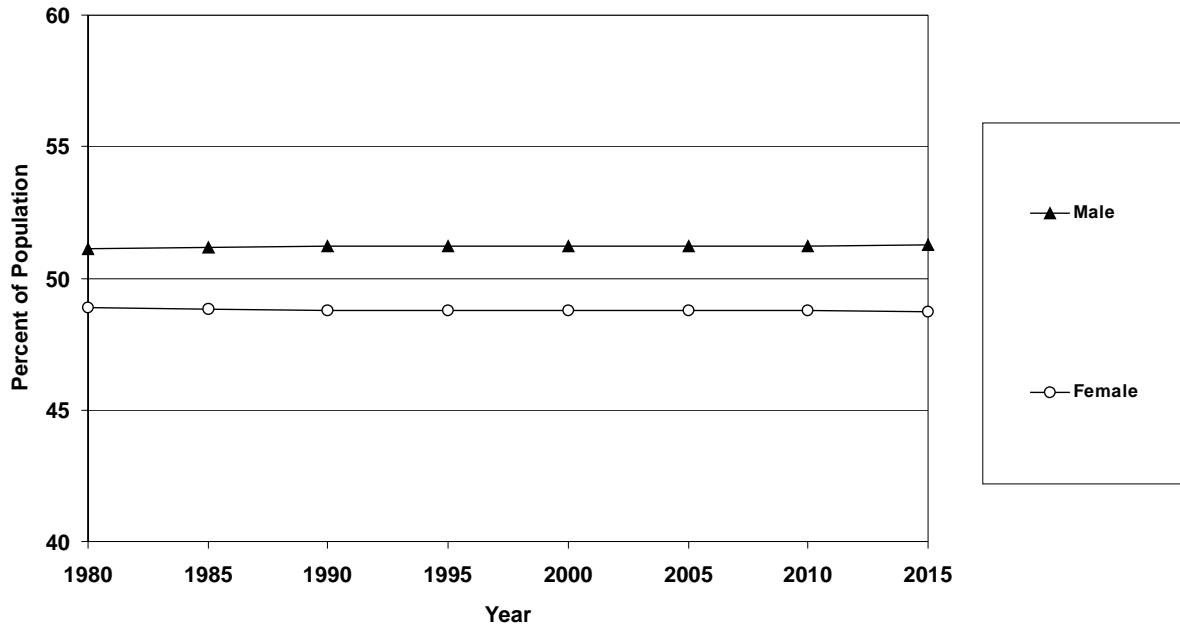


Gender

Data and projections on percentages of youth 17 years old and younger for gender are depicted below from 1980 to 2015.

Percentages of National Population (17 and Under) of Each Gender

Data from 1990 and 2000 Census and Census Projections, reanalyzed by Responsive Management (2002)

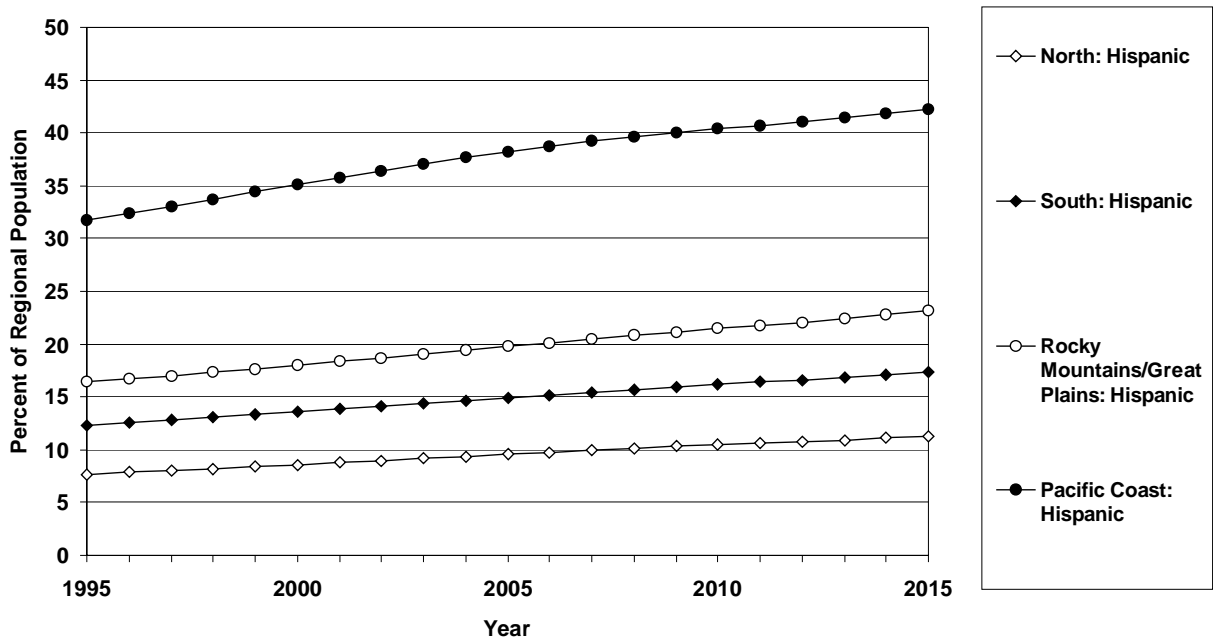


Ethnicity

The percentage of the population 17 years old and younger that is Hispanic is shown in the following graphs by region. The data have been analyzed using the three different regional (Bowker et al., Census I, and Census II) classification systems. The first two graphs show that the highest proportion of Hispanic children (relative to all other races of children in each region) come from the Pacific Coast and the Rocky Mountain/Great Plains Regions. Even more importantly, the graphs show that these populations are growing in relative percent to all other races.

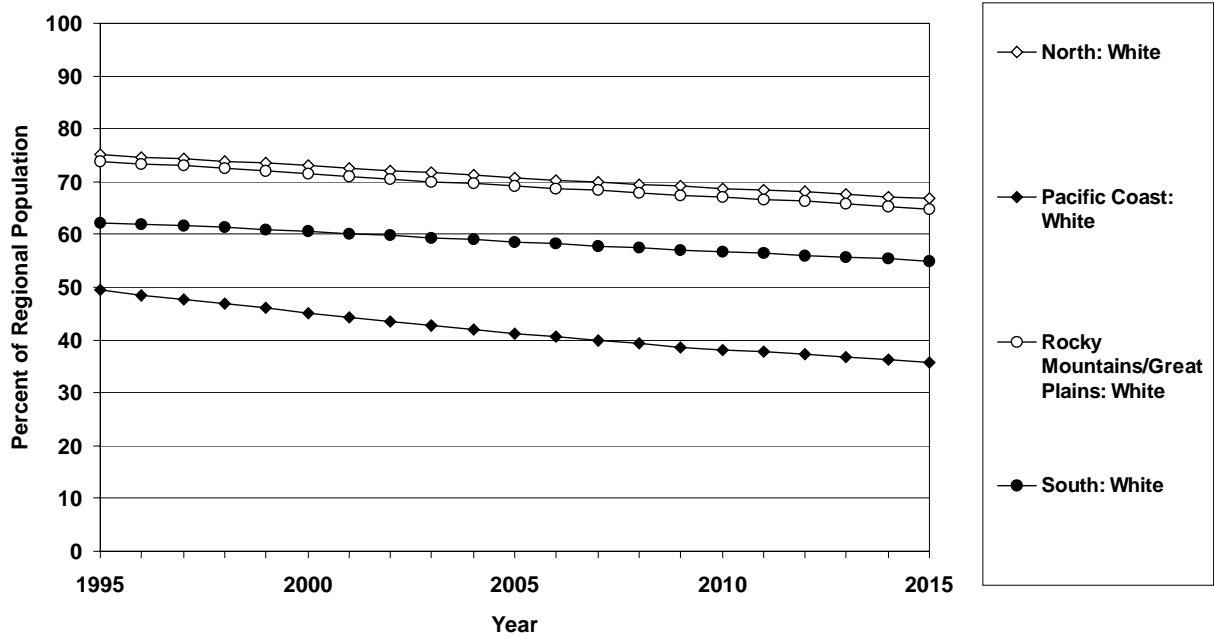
Percent of Regional (17 and Under) Population that is Hispanic Relative to Bowker, English and Cordell's (1999) Regions

Data from 1990 and 2000 Census and Census Projections, and reanalyzed by Responsive Management (2002)



Percent of Regional (17 and Under) Population that is White Relative to Bowker, English and Cordell's (1999) Regions

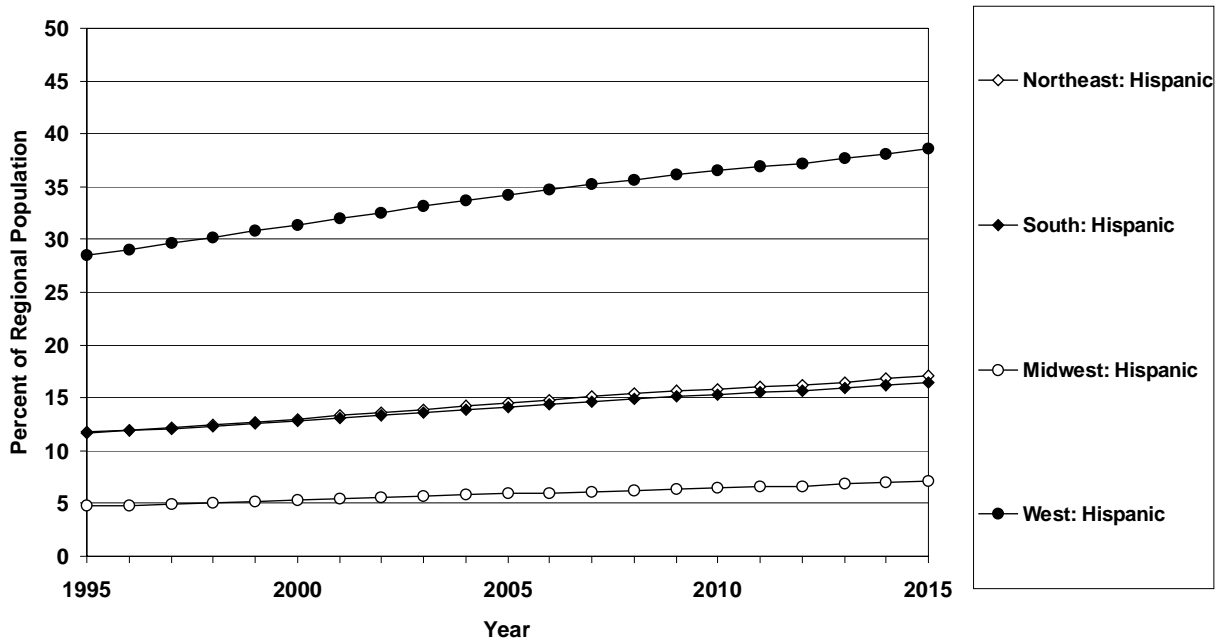
Data from 1990 and 2000 Census and Census Projections, and reanalyzed by Responsive Management (2002)



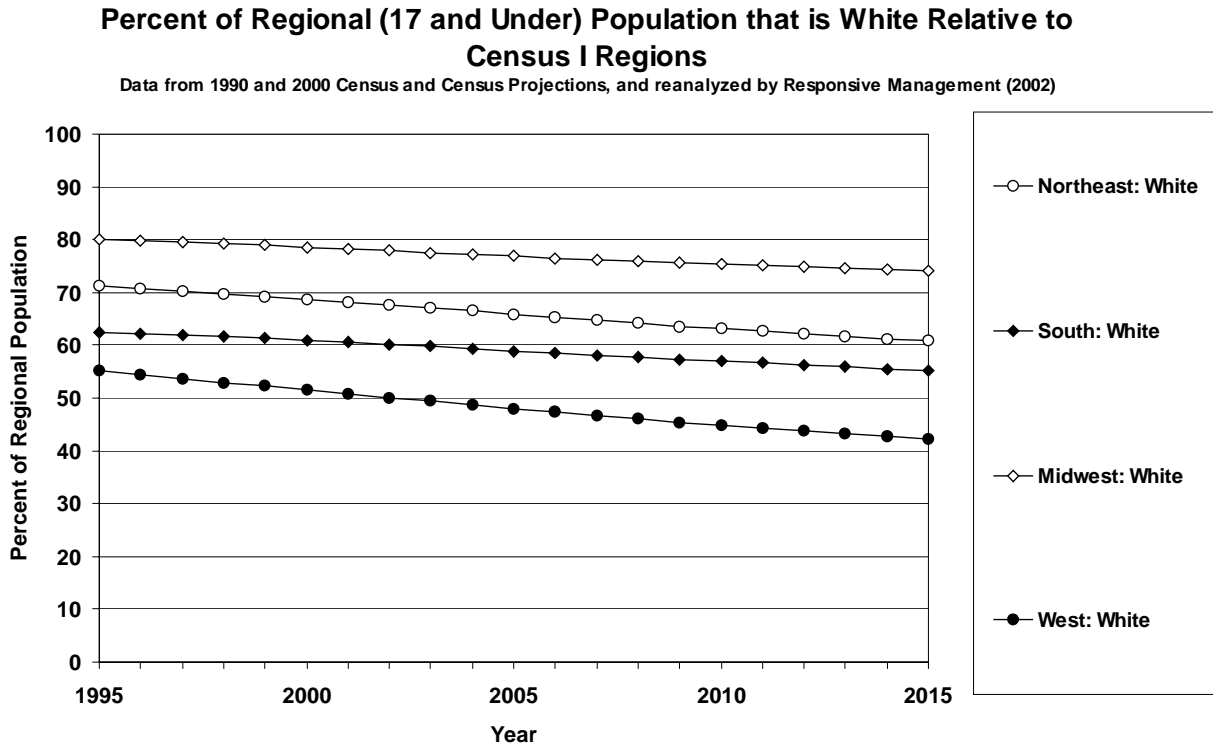
The graph below shows that the Western Region has both the highest percentage of Hispanic youth of any region, but that it also has the highest rate of growth in percentage of Hispanic youth as well.

Percent of Regional (17 and Under) Population that is Hispanic Relative to Census I Regions

Data from 1990 and 2000 Census and Census Projections, and reanalyzed by Responsive Management (2002)



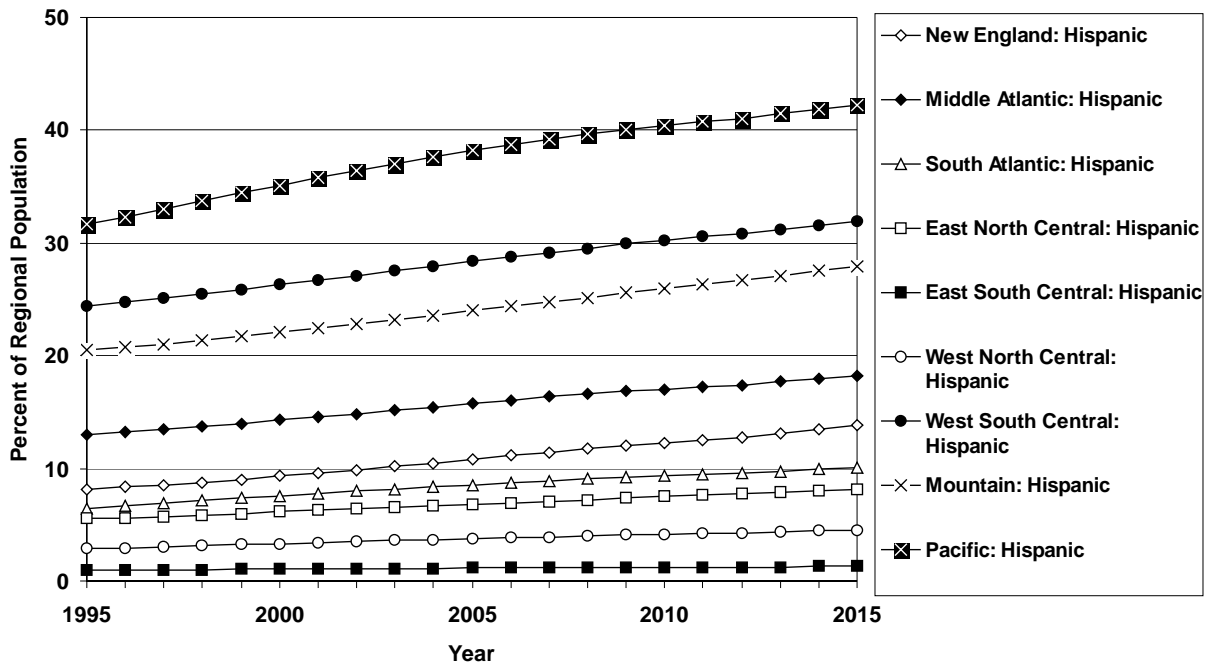
The graph below shows that the Midwest Region has the highest proportion of white children, but that, as in all of the other regional graphs, the proportion of the population comprised of these children is steadily declining.



The first graph below shows that the Pacific and West/South Central Regions have the highest proportions of Hispanic children. The rates of growth of the proportion of Hispanic children in each of these regions are similar. The second graph below shows that the West North Central Region has the highest proportion of children 17 years old and younger who are white. The East South Central Region is the only region to show an almost steady proportion of these children with no apparent rate of decline.

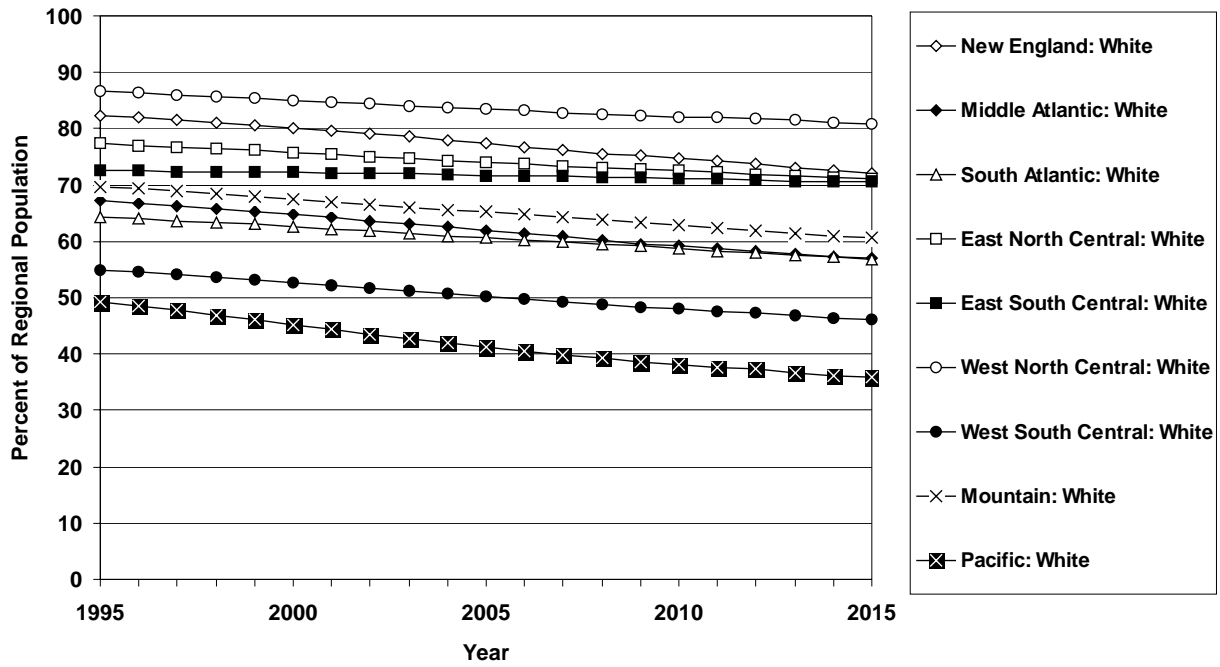
Percent of Regional (17 and Under) Population that is Hispanic Relative to Census II (2002) Regions

Data from 1990 and 2000 Census and Census Projections, and reanalyzed by Responsive Management (2002)



Percent of Regional (17 and Under) Population that is White Relative to Census II (2002) Regions

Data from 1990 and 2000 Census and Census Projections, and reanalyzed by Responsive Management (2002)

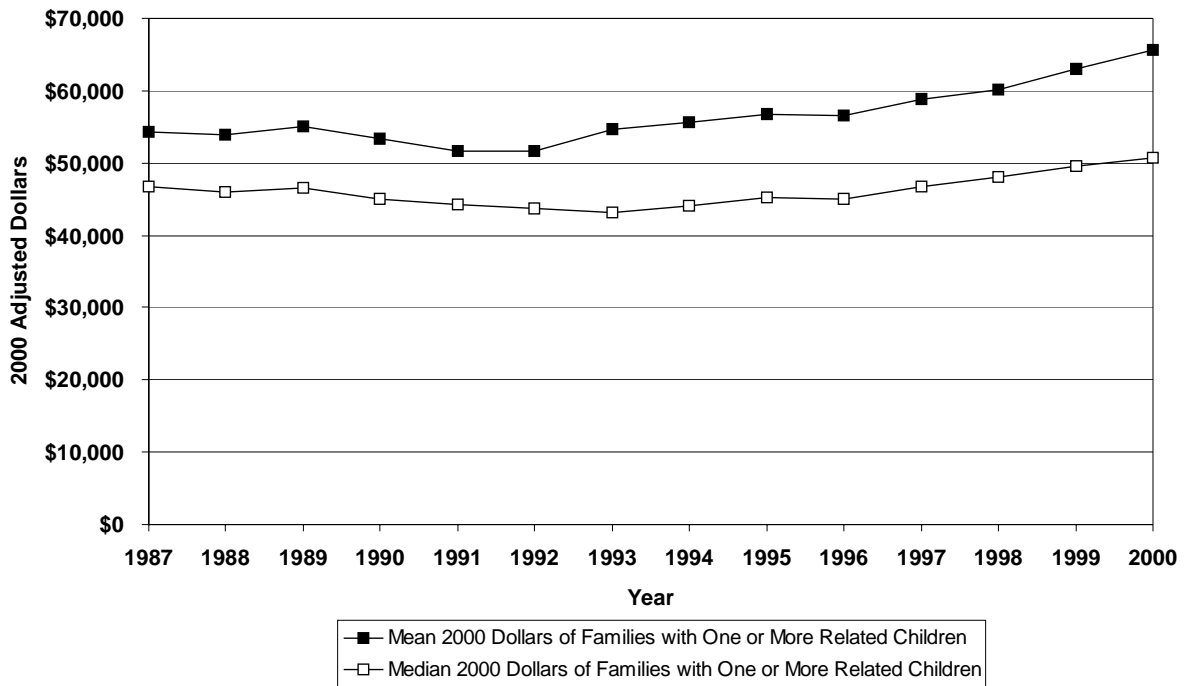


Income

Below are data from the Bureau of Labor and Statistics (2002) and the U.S. Bureau of the Census (2002) that shows the mean and median incomes of families with one or more related children. These dollar values have been adjusted to 2002 dollars. There has been only a slight increase in the incomes between 1987 and 2000.

Mean and Median Dollars (Adjusted to 2000) of Families with One or More Related Children

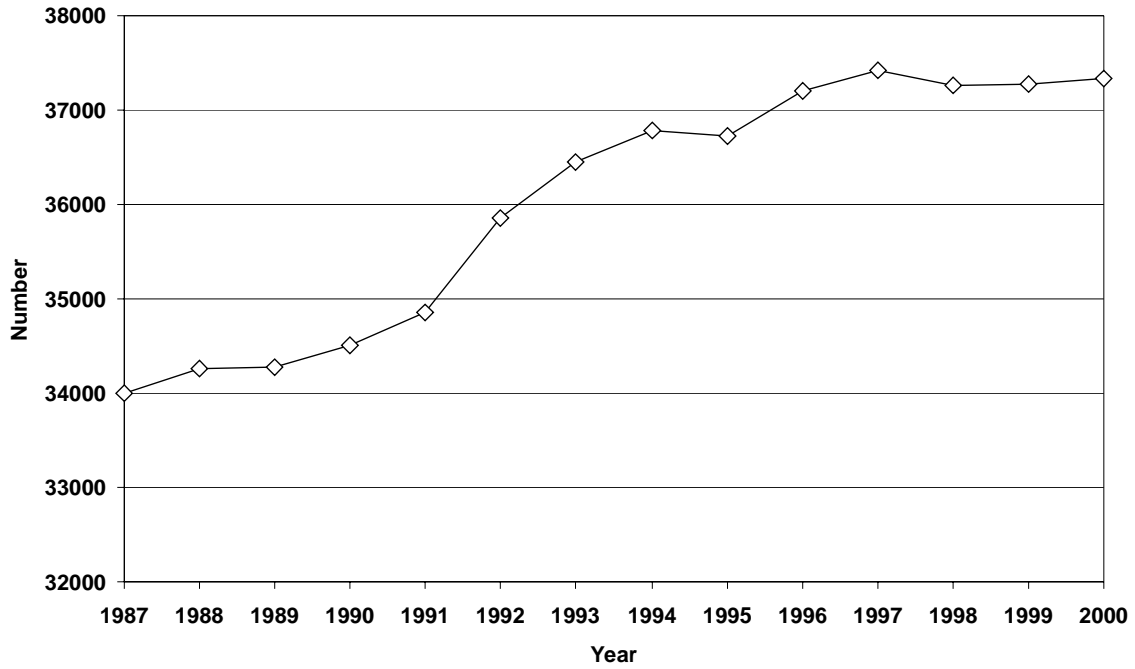
Data from Bureau of Labor and Statistics (2002) and U.S. Census Bureau (2002)



The total number of families has gradually reduced its rate of increase as shown below.

Numbers of Families (In Thousands)

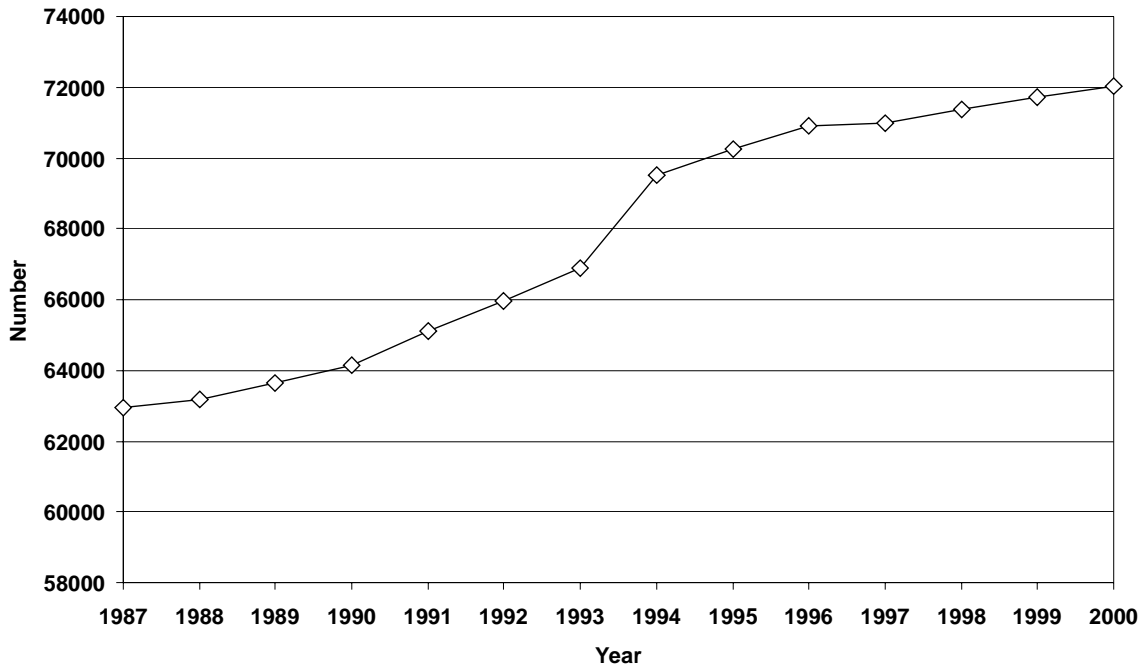
Data from U.S. Census Bureau (2002)



The number of children 17 years old and younger has increased from 1987 to 2000, but has a reduced rate of increase beginning in 1994, as seen in the following graph.

Number of Children (17 and Under) (In Thousands)

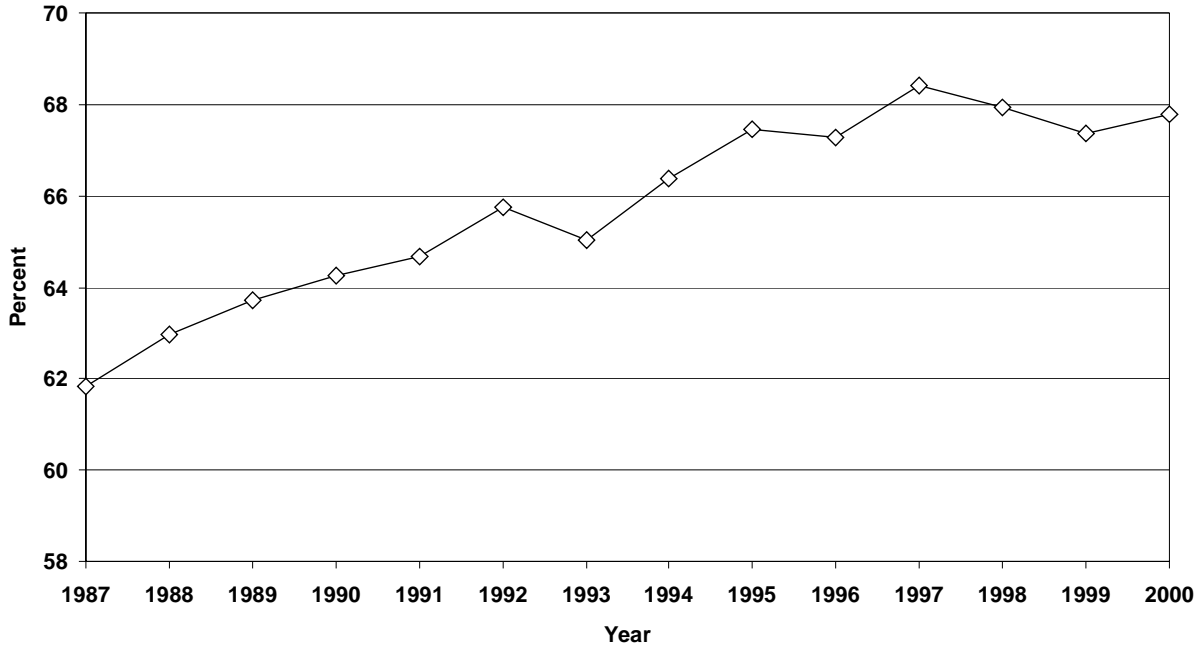
Data from U.S. Census Bureau (2002)



The percent of married couples with children under 18 that have two wage earners has increased steadily. This statistic has been selected on which to base an estimate of the number of dual earners per families having two eligible earners, whether married or not.

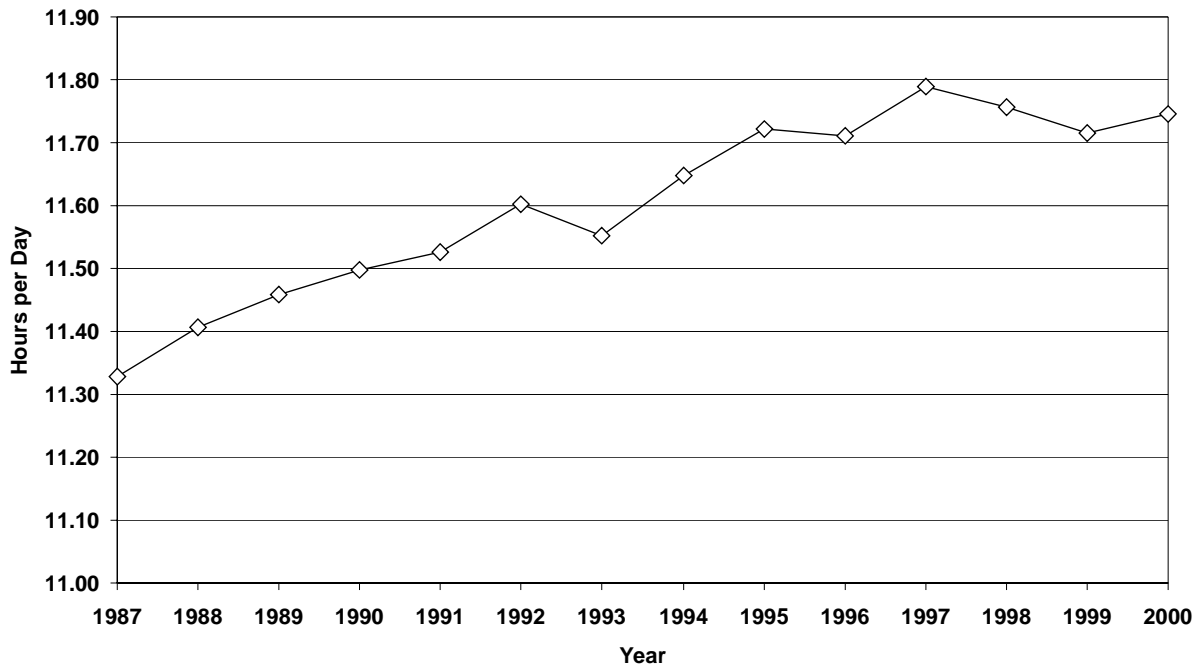
Percent Of Married Couples with one or More Children Under 18 that Have Dual Earners

Data from Bureau of Labor and Statistics (2002) and U.S. Census Bureau (2002), adapted by Responsive Management (2002)

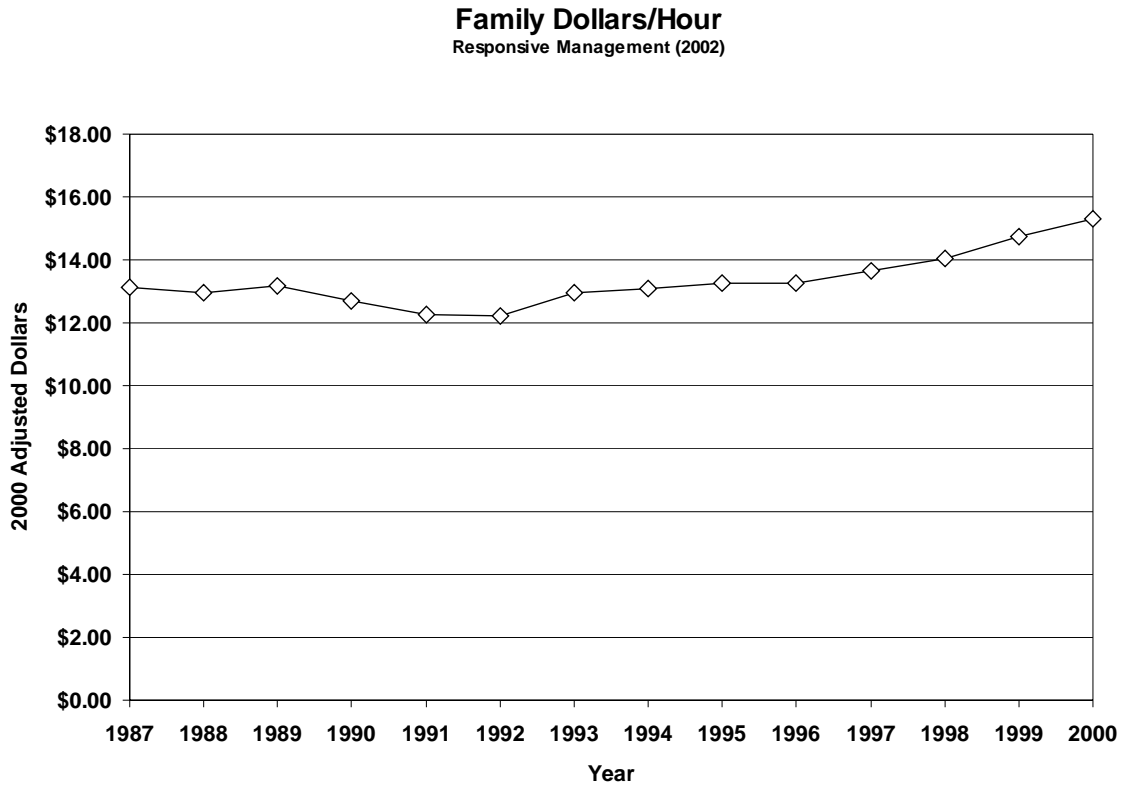


Below is a graph showing a calculation of the number of wage hours per week for the average family with children. This value was calculated using the average income, the proportion of dual-earner families, and an assumption of a 7-hour pay period (8-hour workday excluding lunch). Families with children have worked increasingly more hours each year between 1987 and 2000.

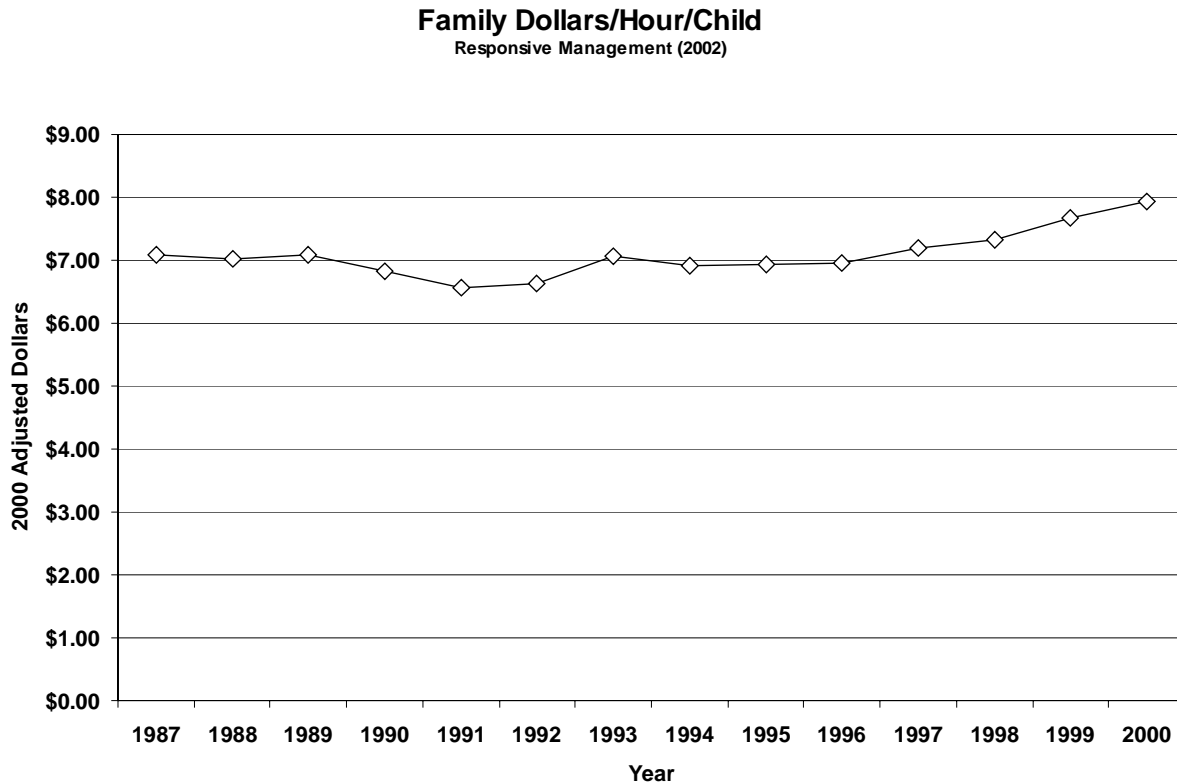
Family Wage Hours/Day (Assumes 7-Hour Work Day)
 Responsive Management (2002)



Below is a graph showing a calculation of the average dollars per hour earned by the average family using the same assumptions as in the previous graphs. The average dollars per hour for a family has shown almost no growth despite the increase in the number of hours worked.



Below is a graph showing a calculation of the average wages earned per family per hour per child. It shows that this value has remained virtually unchanged from 1987 to 2000.



Conclusions

Overall, the number of children under 18 has increased. Despite this increase, the rest of the population has outpaced them. Children have become, and are expected to continue to be, a dwindling percentage of the population. Most of the population lives in non-rural housing, and the percentage of the population that lives in rural housing is expected to continue to decrease. The percentage of Hispanic children relative to all children is on the rise in many parts of the United States, whereas the percentage of white children relative to all children is decreasing. Finally, families with children are working more hours, but receiving nearly the same wages.

Chapter 2: Age-Related Participation in Sports

This chapter provides an overview of theory on trends in child development and developmental trends in children in sports. This chapter also reports on the current status of youth participation in sports and outdoor-related activities, including hunting and fishing.

Overview of Theory on Trends In Child Development

The following section provides a brief description of childhood developmental trends. This topic has received much attention over the past 100 years, and cannot be adequately examined in a single book, let alone a single chapter. Therefore, by necessity, this review is limited in its scope and aim. There are many theories on child development that relate to, support, and/or refute those presented here. There are still even more theories that might appear to have only superficial relationships to factors related to hunting and fishing participation among the nation's youth, yet also have elements that could add to the understanding of these phenomena. There is a large body of individual elements of research gathered over the past century that may add to or refute these theories, or may, if examined in a different light, result in entirely different ideas about the stages of child development. Finally, for the purposes of the current work, there are a host of theories that appeared to have less promise for application to the current project and, therefore, have not been examined here.

Theories

The idea of stages of development, and the establishment of the idea of nature as a part of the “nature versus nurture” debate, may have first begun with Darwin's ideas of stages of evolution (see Roediger, Rushton, Capaldi and Paris 1986). Darwin's (1859) ideas about nature as an environmental pressure that shapes the development of species placed nature and processes such as natural selection as prime movers in thoughts about development.

Watson (1928) mounted a strong opposition to this viewpoint, indicating that biology could not explain all behavior. He proposed that developmental experience was the most important influence on a human being. These conflicting opinions were resolved by adopting an interactive perspective on nature and nurture as co-contributors to development (Roediger, Rushton, Capaldi and Paris 1986). Even newer theories (Newell 1986) show strong arguments for development as an interaction between the individual, the environment, and the task. This seemingly new perspective comes from an older, but previously (before the mid-1980s) ignored, psychological theory known as ecological theory (Gibson 1979) that was derived from a theory based on mathematics (Bernstein 1967).

Much research has focused on the idea of “sensitive periods” when particular skills are learned best. In some cases, like language acquisition, failure to learn particular skills at a certain time, either through lack of appropriate exposure to speech or failure to address organic disabilities such as hearing disorders, can have devastating effects.

While devastating developmental delays are not usually the issue in sports in general, or in hunting and fishing in particular, the idea of developmental sensitivity presents an element of concern in those areas.

Perceptual-Motor/Maturation

According to Piaget (1926), children pass through a number of developmental stages that are marked by differences in behaviors and cognitions. Through observation of his children and other children, he described three dynamic elements of maturation accounting for change. The elements were assimilation, accommodation, and equilibration. Assimilation was the adaptation of new information to older ideas, accommodation was the use of old ideas to understand new information, and equilibration was the dynamic interaction between assimilation and accommodation.

These ideas are quite similar to ideas from the dynamical systems viewpoint espoused by Newell (1986) and others, where the task, the individual, and the environment interact through stages of high stability despite the influence of the environment (much like accommodation) until a “breakpoint” is reached. There is then a stage of chaos where the old system of behavior and/or knowledge is eradicated, but a new one is not yet formed. Finally, a newly formed, stable state is achieved. This, in Piaget’s way of thinking, would be “climbing a rung” on the stages of development.

Piaget’s Stages

The four stages Piaget identified were the Sensorimotor (Birth to 2 years), the Preoperational (2 to 7 years), the Concrete Operational (7 to 11 years), and the Formal Operational (11 years to adult) periods.

During the first (Sensorimotor) stage children generally learn about immediate cause and effect, and gain the idea of objects that are not visible still existing (object permanence). During the second (Preoperational) stage, children have a “literal” view of the world. Dreams are considered real, objects can be alive, difference in appearance (for instance a disguise) means that the disguised item has truly changed into another object (Roediger et al. 1986). Other aspects of this stage included an “uncoordinated” (Bernstein 1967) method of solving problems that considers only a single element of tasks requiring multiple considerations. Children at this stage also, according to Piaget, see change as irreversible. During the third (Concrete Operational) stage, children begin to use heuristics to solve problems. These “rules of thumb” help solve problems, but children are still ensconced in concrete (not abstract) problems. Children in this stage begin to learn that actions are reversible and that things can be classified (a Labrador retriever and a beagle are different types of dogs). They also learn to coordinate multiple knowledge elements required to determine that, for instance, a fat, short cup can hold as much liquid as a tall, skinny one. Finally, children in the fourth (Formal Operational) stage learn to solve abstract problems.

Piaget’s theory is just one of many on the topic of child development. Several other theories will be presented below to show a more rounded look at current opinions. Theories help people understand and predict behaviors, and to that end they are helpful; however, there is some danger in elevating theories above facts. Theories are simply lenses through which the facts can be viewed.

Information Processing

Following the lead of Roediger et al. (1996), information processing theories use a “computer-like” view of the world to explain how children learn. This theory shows development as an increase in the organization of facts, concepts, and ideas, and the connections among them. The processing of information, according to these types of theories, leads to increased automaticity, better recall, and greater capacity to handle multiple mental processes simultaneously.

The ideas behind this theory are also quite similar to a theory called Schema Theory, which had its origins in psychology but has also been adopted as a theory of human movement in sports (Schmidt 1991). Other, similar theories, for instance Adams’ closed loop theory of motor learning (Adams 1971), came from, or were inspired by, psychology. Most early motor learning and sport psychology researchers were psychologists and/or borrowed their ideas from the field of psychology.

A common theme among the ideas presented thus far is that changes occur due to maturation, that these changes seem to have identifiable characteristics, and that these characteristics seem to progress in logical sequences. The details of these sequences, the ages when they occur, and especially why they occur, are subject for continued debate.

Erikson

Erikson (1950) described the way children grow to be adults and how they change as social and emotional beings in his theory of psychosocial development. The stages Erikson describes hold with the Dynamical Systems approach in that the stages describe a process of challenge, crises, and resolution. These stages are much like the stages of stability, chaos, and new stability in dynamical systems. This is also much like Piaget’s ideas of accommodation, adaptation, and equilibration.

Erikson described 8 stages: Trust Versus Mistrust (under 2 years of age), Autonomy Versus Doubt and Shame (2-3 years of age), Initiative Versus Guilt (3-6 years of age), Industry Versus Inferiority (6-11 years of age), Identity Versus Role Confusion (adolescence), Intimacy Versus Isolation (young adulthood), Generativity Versus Stagnation (adulthood), and Integrity Versus Despair (Old Age).

During the Trust Versus Mistrust phase, infants gain a sense of trust or mistrust through the dependability of their surroundings. The resolution of this stage comes about by learning to depend on caretakers. The second stage, Autonomy Versus Doubt and Shame, is a stage that resolves through the gradual separation of the child from the parent. This stage is resolved through maintaining confidence while learning “adjustment to social rules” (Roediger et al. 1986). The Initiative Versus Guilt stage is much like the previous stage. It is a stage of continued separation from parents that is also filled with demonstrations of personal will and ability, and identification of and identification with the roles of an adult. Like the previous stage, confidence and continued acquisition of the rules of society are the goals.

In the Industry Versus Inferiority stage, children begin to sharpen the skills of their culture. This means mastering school and other activities valued in their environment. During the fifth stage, Identity Versus Role Confusion, a continuation of what Erikson called individuation takes place. Individuation, Erickson believed, was the continued progress through

stages of determining whom a person is as a person, and how this relates to family, culture, and society. These ideas are quite similar to the ideas held in Object-Relations theory (St. Claire 1986) in that a person learns about how to relate to others through the experiences in his or her own relationships while growing up.

Again, this and several other theories share characteristics. Stages six, seven, and eight are, respectively, about finding love and relationships, contribution to family and society, and gaining perspective and wisdom about the past.

Theory On Developmental Trends In Children In Sports

Malina (1988) suggested that the measure of a child's readiness for sport participation was the level to which the child could meet the demands of the task. Although this seems obvious, research suggests that some instructors still try to teach throwing and catching skills to children under the ages of 3, 4 and 5, when research has shown that large percentages of these children have the developmental capability to throw, but not yet to catch (Wickstrom 1977).

This section of this literature review uses Brustad's (1993) framework to discuss these developmental issues. The review will also spend a great deal of time discussing the psychological components of participatory and attritional motivations in sports.

Passer (1988), reflecting shades of theory from Erikson (1950), said that children use play to gain a sense of who they are in the context of others. Part of this is a struggle to gain a sense of comparison to peers. If this connection is followed further, it is logical to say that these strivings help show the child who they are relative to the family and to peers and society. Using ideas from modeling from social learning theory (Bandura 1986) showed that exposure to others while participating in play activities gives a sense of information about what the child is capable of doing.

Brustad (1993) indicated that children do not begin striving for this type of comparison until 5 or 6 years old. Under the age of 10, children gain most of their ideas about their abilities from objective performance outcomes and from the comments about their abilities from adults (Brustad 1993). This is probably related to the ideas that Piaget (1926) introduced about the ages of reasoning, with the more mature conceptions of problems and their solutions, and or logic that come about in the Formal Operational period from ages 11 and older. It is perhaps a telling sign of development that it is also at this approximate age that high levels of attrition from sports have been reported (Sapp & Haubenstricker 1978). It is also telling that ages 10 and up appear to be ages where children begin relying almost exclusively on information from children their own age to determine their abilities. In fact, Nicholls (Nicholls 1978; Nicholls & Miller 1983) found that it was not until ages 11 to 12 that children begin to understand the differences between ability and effort in the causes of outcomes.

All of these clues to childhood sports motivation and attrition may hint to a certain level of "awakening" of children to the world around them and their relationship to it, around ages 10 and older. This new awareness has many levels; familial, cultural, sport experiential, and so on. The following two subsections discuss, again following the organization set forth by Brustad (1993), the information on childhood motivation to participate in youth sports, and then reasons that youth drop out of sports.

Youth Sport Motivation

According to Martens (1986), as of 1986 approximately 44% of all children between the ages of 6 and 18 had participated in organized non-school sports. According to data from Michigan (State of Michigan 1976a; State of Michigan 1976b; State of Michigan 1976c), the number of participants rapidly decreases after age 11.

Data from the National Sporting Goods Association (1997), and from the Sporting Goods Manufacturers Association (2001; 2002) show a general increase in most measures of participation for most sports across the age range, although there are differences between the two reports. It is quite possible that the reasons for these differences may be largely due to sampling methodology¹.

Motivational Theory

Motivational research about children in sports comes primarily from two approaches. One, Cognitive Evaluation Theory (Deci & Ryan 1985), hypothesizes that childhood motivation is driven by a desire to feel in control and feel that they have high ability. Influences that minimize or undermine those motives lead to reduced intrinsic motivation. Negative information about ability and controlling elements in the environment are examples of intrinsic motivation detractors. It is, perhaps, not surprising then that as children become more aware of ability between the ages of 10 and 12, they may, at least according to research from the state of Michigan, leave the sport (State of Michigan 1976c; State of Michigan 1976b; State of Michigan 1976a). According to Cognitive Evaluation Theory, individuals tend to concentrate on the dimension most important (salient) to them in any given situation (Deci & Ryan 1985). The other approach, Competence Motivation Theory, (Harter 1981) suggests that children are motivated to master skills. Skilled performance leads to feelings of competence and mastery. Those experiences influence the development of intrinsically or extrinsically oriented sport participants. An individual who is motivated intrinsically in Harter's (1981) model has an internal reference for self-evaluation, a high sense of control, and a high sense of ability.

Goal Orientations

Below are four theories on ways that the types of internal goals held by children have been hypothesized as influences on motivation to participate.

Maehr & Nicholls (Maehr & Nicholls 1980) felt that the three orientations that children had that motivated their behavior were task, ability, and social approval. Those who are task-oriented are focused on learning and improving and judge themselves on personal and task improvement. Ability-oriented children are focused on ability demonstrations and judge

¹ If participation data have been tracked by sampling from purchase behavior, that sampling strategy would likely overrepresent individuals with money to spend, thereby inflating the *appearance* of the number of older participants, because older participants might have more money to spend. This will be discussed at greater lengths in the section "Current Status Of Sport Participation" below.

themselves based on how they compare to others, while social-approval-oriented children seek external acceptance by demonstrating effort.

Nicholls (Nicholls 1978; Nicholls & Miller 1983) suggested that childhood motivations were based on undifferentiated versus differentiated conceptions of ability. In this theory, an ego-orientation motivates individuals to maximize external demonstrations of ability and minimize external demonstrations of effort, by choosing tasks which will require little effort or will display high ability (Nicholls 1978; Nicholls and Miller 1983). In the task-involved orientation, effort and ability are the same to the child, so the child attempts to master the task (Nicholls 1978; Nicholls and Miller 1983).

Dweck, in research on learned-helplessness (Dweck & Bempechat 1988; Dweck & Elliott 1983; Elliott & Dweck 1988) hypothesized that individuals who perceive ability as a non-controllable, stable trait will adopt performance goals aimed at demonstrating ability, and respond to failures with learned-helpless, low-ability attributions. Those attributions will result in subsequent decrements in affect, effort, persistence, and performance. This orientation is known as the performance orientation. Conversely, those who view ability as malleable will focus on constructive changes in strategy and effort and maintain self-concept. This is known as the incremental or learning goals.

Ames (1984) has suggested that competitive, individual, and cooperative reward systems influence the adoption of Nicholls' (1983) ego and task orientations, and her own moral motivation orientation, respectively. Spence and Helmreich (1983) have also suggested a schema that taps concepts of work, mastery, competitiveness, and personal unconcern to examine gender differences in achievement behaviors.

Motivational Findings

The summary data on why children participate in sports, as opposed to the theories on childhood sports participation, give strong insight into the childhood mindset about sports. Research by Ewing and Seefeldt (1989) shows that the number one reason for males and females to participate in school sports is to have fun. For girls, staying in shape was the second most important reason to participate in school and non-school sports. Getting exercise and improving skills were the third and fourth, respectively, most important reasons for girls for participating in school and non-school sports. For males, the number two reason for non-school sports participation was "to do something I'm good at." For school sports, the second most important reason for participating was to improve skills. Improving skills was also the third most important reason for males for participating in non-school sports. The third most important reason for males for participating in school sports was for the excitement of competition.

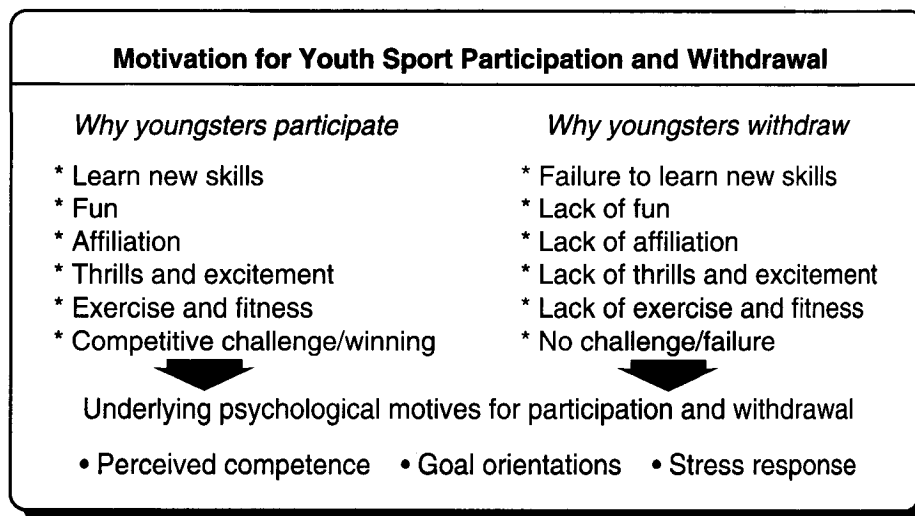
Attrition

According to some of the same research cited earlier (Ewing and Seefeldt 1989; State of Michigan 1976a; State of Michigan 1976b; State of Michigan 1976c), there is a significant decline in the percentage of children involved in organized sports starting from between the ages of 10 and 13 and continuing to the age of 18. Also, according to Gould and Petchlikoff (1988), there is a 35% dropout rate in organized youth sports each year.

The top reasons for dropping out of sports, as cited from a study by Gould, Feltz, Horn, and Weiss, were that children did not feel that they were as good at the sport as they wanted to be, that the sport was not fun enough, that they wanted to play another sport, that the pressure was too much, that they were bored, that they did not like the coach, that the training was too difficult, and that the sport was not exciting enough (Weinberg & Gould 1995).

According to Gould and Petchlikoff (1988), the underlying reasons for sport and exercise participation and attrition have to do with children's sense of competence, the types of goal orientations they have, and their levels of anxiety.

Harter's (1981) Competence Motivation Theory suggests that children have three domains in which they desire to express competence. These are the social, cognitive, and physical domains of achievement. The basic tenets of this theory are that individuals participate in domains in which they can express their high ability. The insinuation would be that children who have low ability would be more inclined to leave the sport. Therefore, teaching sport skills should lead to both higher skill levels, as well as increased participation. Below is a schematic presented in Weinberg and Gould (1995) and derived from Gould and Petlichkoff (1988) that summarizes a model thought to explain the motives for sport participation and attrition. It shows desired and undesired elements of sport, and the possible theory behind those motives.



Achievement and goal orientation theories (as discussed earlier) have to do with the way children interpret their levels of achievement in sport. One dichotomy of achievement beliefs is Nicholls' (1978) conception of the task-and the ego-involved goal perspectives as discussed above. A person who is task-involved judges success subjectively when performances show personal improvement and task mastery. In contrast, ego-involved individuals define subjective success when they outperform others.

Like Harter's (1981) theory, Nicholls' (1978) theory predicts that children will participate in domains and sports where they can demonstrate the highest level of ability. Conversely, children are unlikely to continue participation when participation shows them to have lower abilities. These ideas support the work of Piaget (1926) and Erickson (1950) discussed earlier that show that between the ages of 10 and 12, children have a certain level of "awakening" regarding whom they are relative to society. This awakening includes a burgeoning ability to

differentiate personal effort from personal ability and to compare personal attributes to those of one's peers.

A third, and less researched conception of sport attrition is Smith's (1986) model of sport withdrawal. This theory considers attrition a product of a cost/benefit analysis. One can see how this theory, despite differences in details from the previous two theories (perceived competence motivation, achievement orientation), shares the child element as an assessor of the drawbacks and benefits of continued participation.

Finally, anxiety or stress is a potential cause for childhood sports attrition. Brustad (1993) indicates that children's anxiety increases with age in the school environment, and reaches its highest level in early adolescence. Again, it is perhaps not surprising that at the approximate age at which children become more self aware and more conscious of their fit with their environment, stress and attrition increase.

Below are data on the current status of sports participation in terms of the raw numbers, percentages of all participants, and percentages of the population in a variety of sports, including the outdoor sports, hunting and fishing, that are the primary concern in this study.

Current Status Of Youth Sports Participation

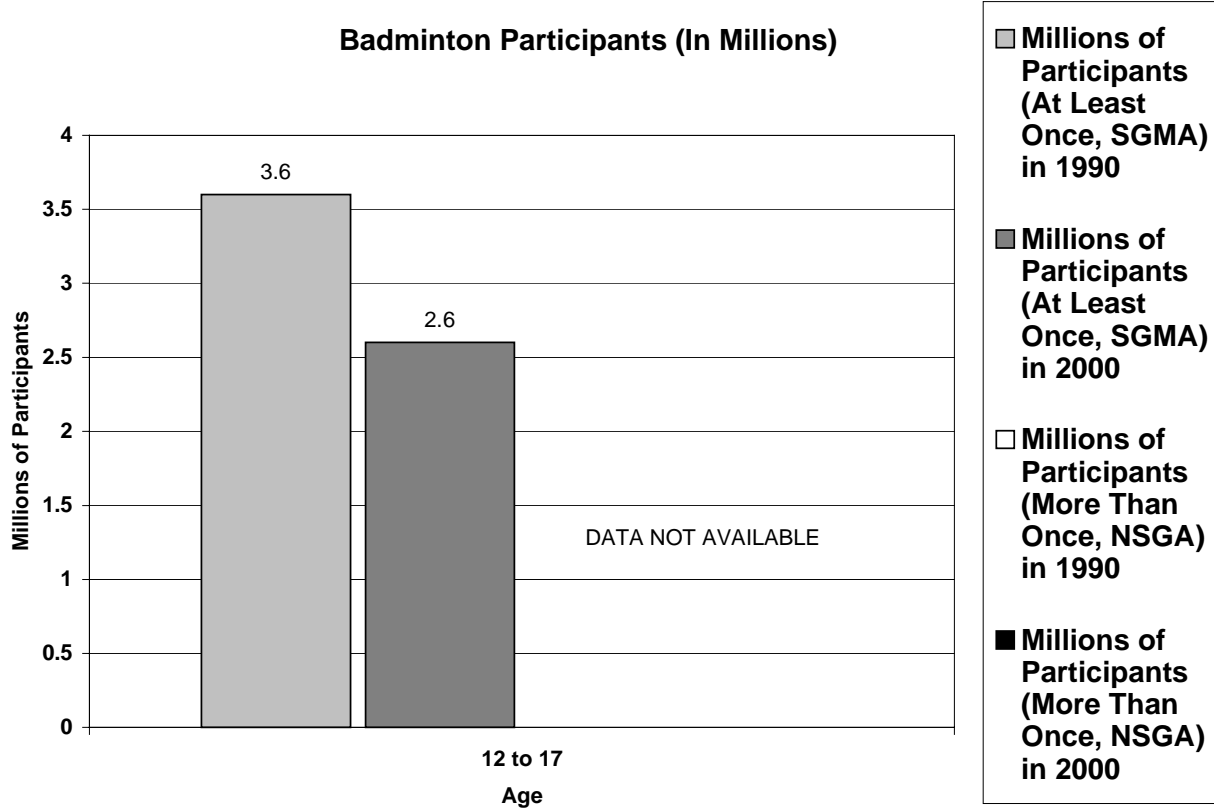
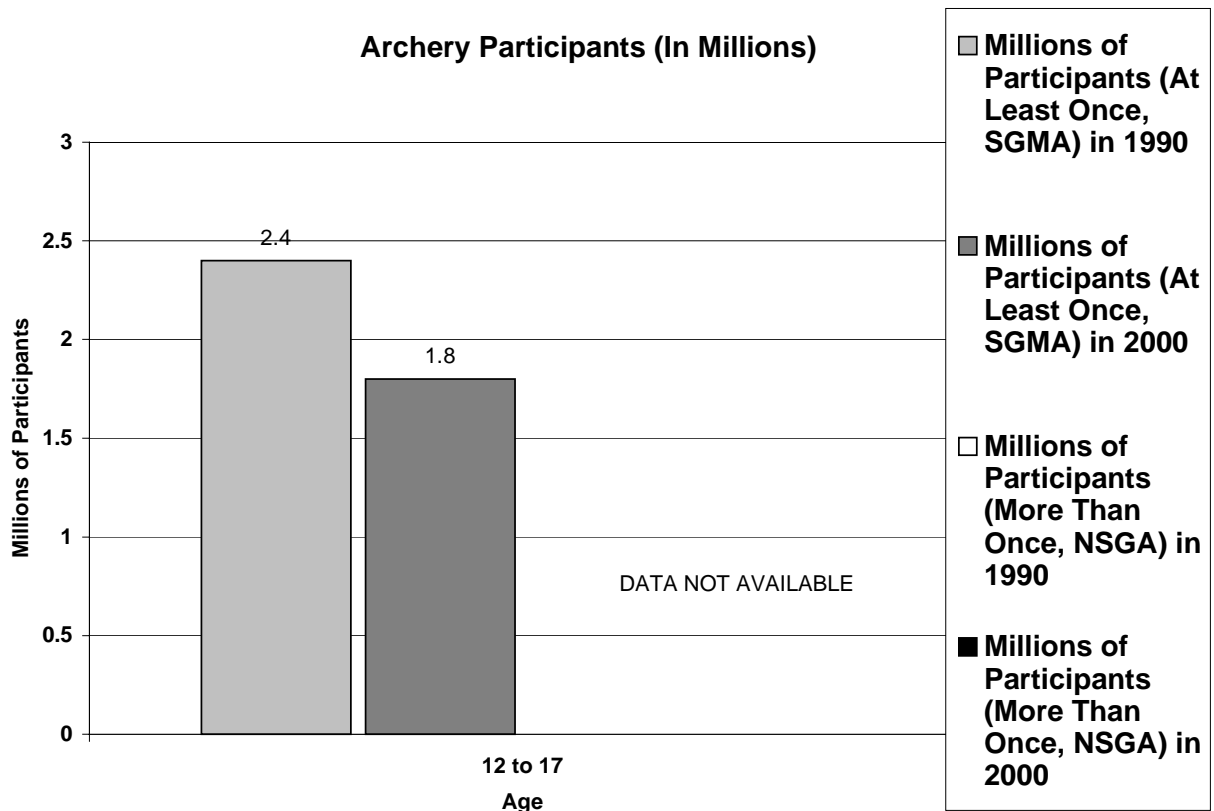
The series of graphs presented in this chapter show data gathered and reanalyzed by Responsive Management from the Sporting Goods Manufacturer Association (SGMA) data (SGMA 2001). These data are presented for each sport as a series of four graphs. The first graph for each sport is the millions of participants in the sport in each age group. The second graph is the "market share" or percent of total participation accounted for by each age group. The third graph in the series for each sport is the "rate" of participation, or the percent of people within each age group who participate. The fourth graph in each sport is a comparison of millions of participants for SGMA and NSGA data, where available, for the 12-17 year age group.

It is fairly clear from much of the data that there is not a consistent drop in participation between 10 and 12 year olds for all sports, contrary to the suggestions of the State of Michigan (State of Michigan 1976a). The data presented here, at times, also conflict (State of Michigan 1976c; State of Michigan 1976b) with the findings from the National Sporting Goods Association (NSGA) (1997; 2002). The differences between the SGMA and NSGA findings are usually in magnitude, and that is explainable by the two different definitions of participation the studies used. SGMA counted a participant as anyone who had participated in the sport at least once. NSGA counted as a participant anyone who had participated more than once. Therefore, as expected, in most cases the numbers from NSGA are smaller than for SGMA as the former entity is more stringent in its definition of a participant. Directional differences between SGMA and NSGA are probably the natural variation associated with sampling error. This can be an especially powerful factor in sports data where participation is very low. Sampling issues may also explain the differences between SGMA and NSGA findings and those found in the research by the State of Michigan (1976a; 1976b; 1976c).

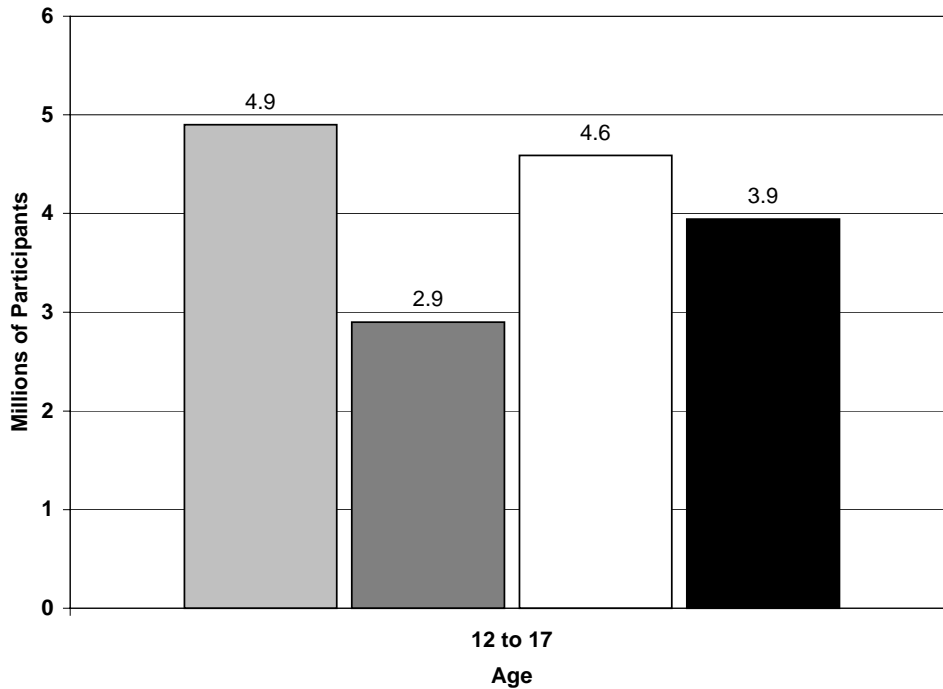
The differences in data may be due to changes in behaviors over time or they may have to do with errors due to sampling methodology. The method of "panel" sampling used by both SGMA and NSGA (1997; 2002; 2001) may be the root of the different results. The panel sampling used by SGMA and NSGA identifies individuals who meet certain criteria (e.g.,

purchasing behavior, Web browsing behavior) and then invites the individuals who meet the criteria to participate in a survey. Those who turn down the invitation are discarded from the potential sample. Those who accept the invitation are then kept in a database and are later contacted when they are needed to complete a survey (Personal Communication, NFO Research, June 7, 2002). Response rates for this type of research are very high because of this self-selection process, and the samples obtained are biased.

Results from studies using this type of panel sampling methodology have the potential for skew because they represent the opinions, attitudes, and behaviors of people who volunteer for the survey. This “double screening” method makes generalizations of the data to larger populations questionable. Research on the influence of skews in response rates show that nonresponders often have very different behaviors, attitudes, and opinions than those who respond (Green 1991). One can imagine that individuals who meet certain criteria (such as browsing certain Web pages or purchasing certain products) are not representative of the population to which the generalizations were meant.

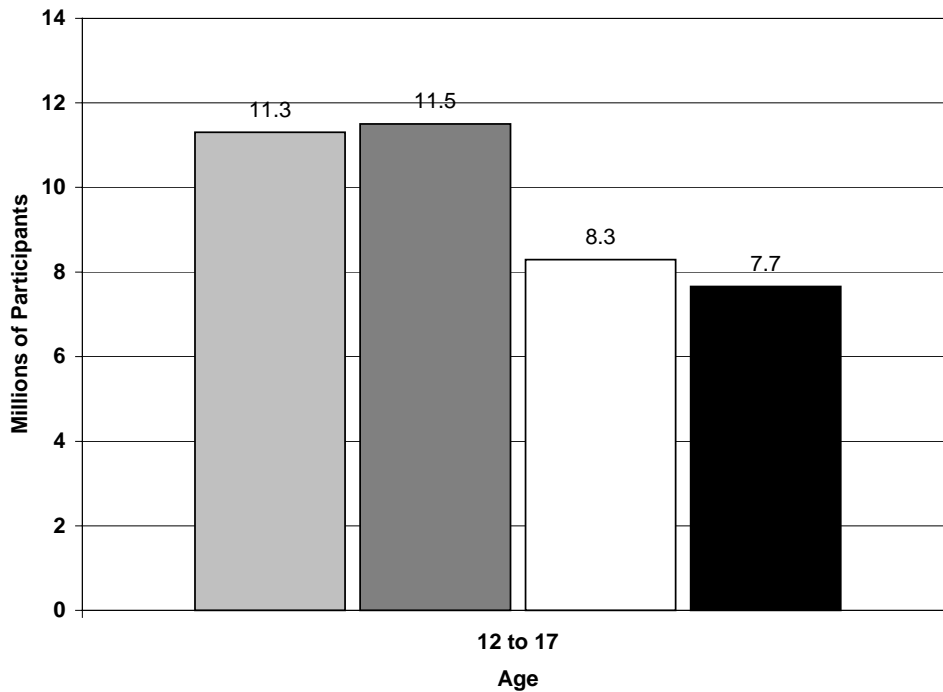


Baseball Participants (In Millions)



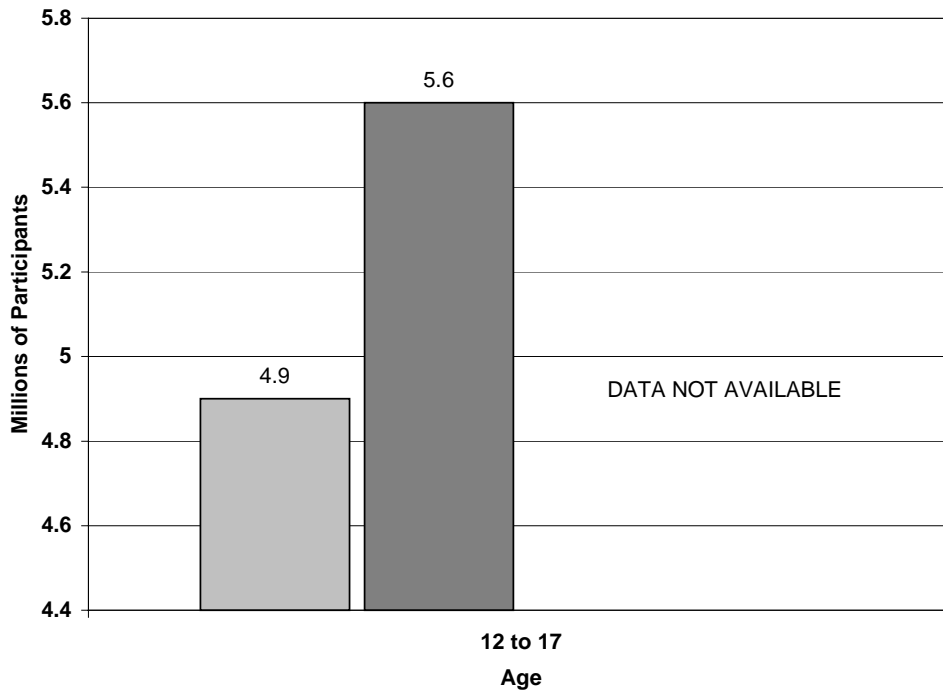
- Millions of Participants (At Least Once, SGMA) in 1990
- Millions of Participants (At Least Once, SGMA) in 2000
- Millions of Participants (More Than Once, NSGA) in 1990
- Millions of Participants (More Than Once, NSGA) in 2000

Basketball Participants (In Millions)



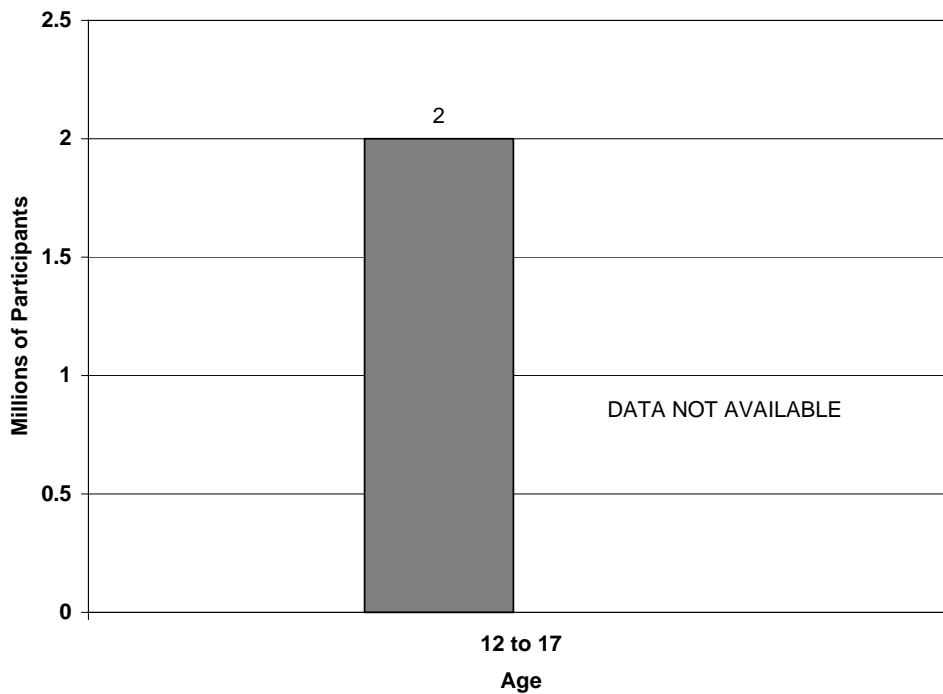
- Millions of Participants (At Least Once, SGMA) in 1990
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- Millions of Participants (More Than Once, NSGA) in 1990
- Millions of Participants (More Than Once, NSGA) in 2000

Billiards Participants (In Millions)



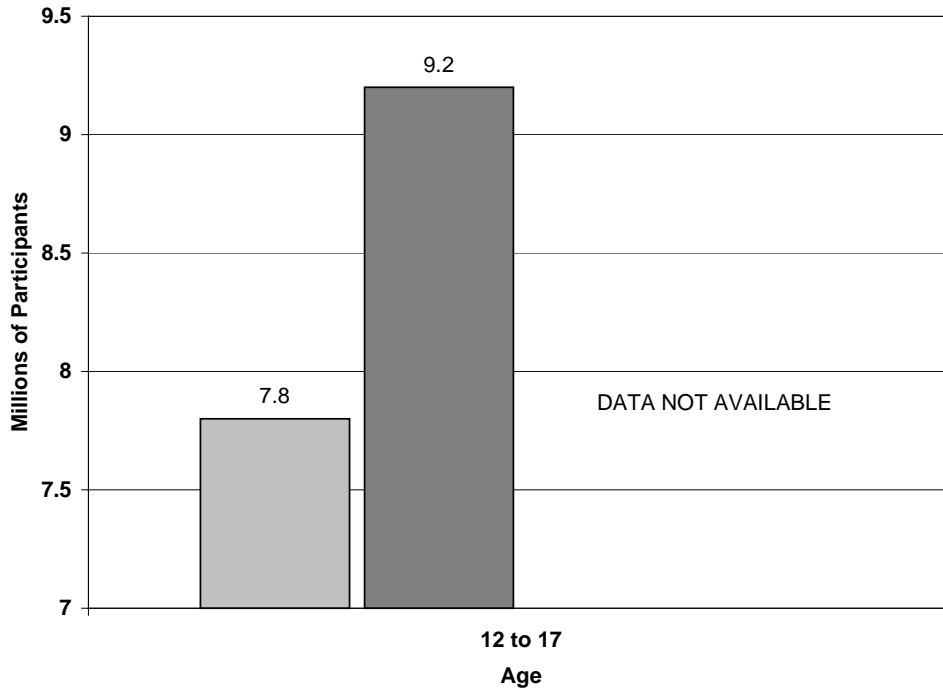
- Millions of Participants (At Least Once, SGMA) in 1990
- Millions of Participants (At Least Once, SGMA) in 2000
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- Millions of Participants (More Than Once, NSGA) in 2000

BMX Bicycling Participants (In Millions)



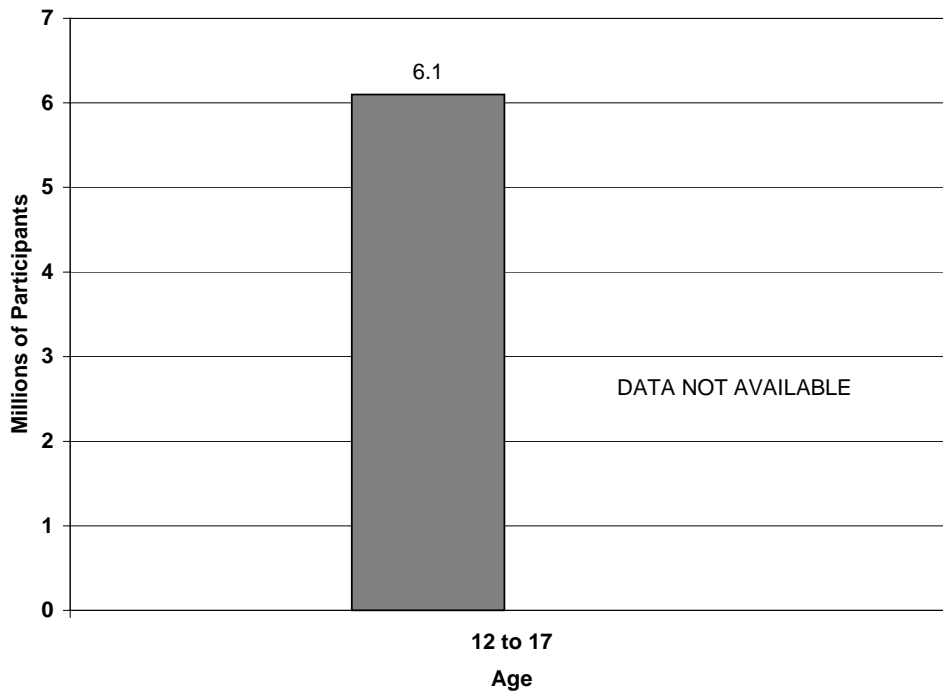
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Bowling Participants (In Millions)



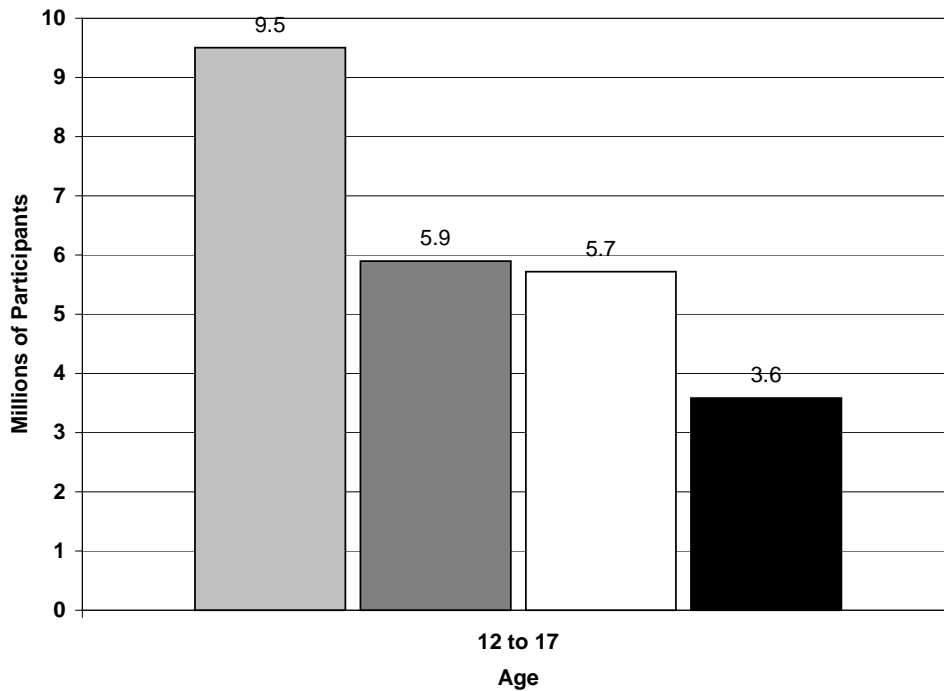
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Calisthenics Participants (In Millions)



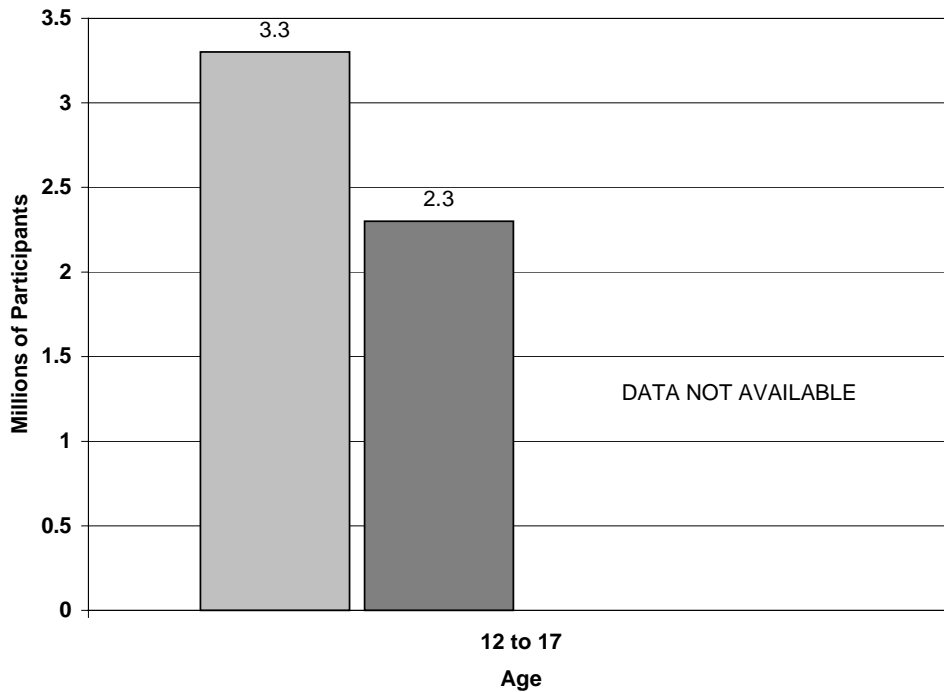
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Court or Grass Volleyball Participants (In Millions)



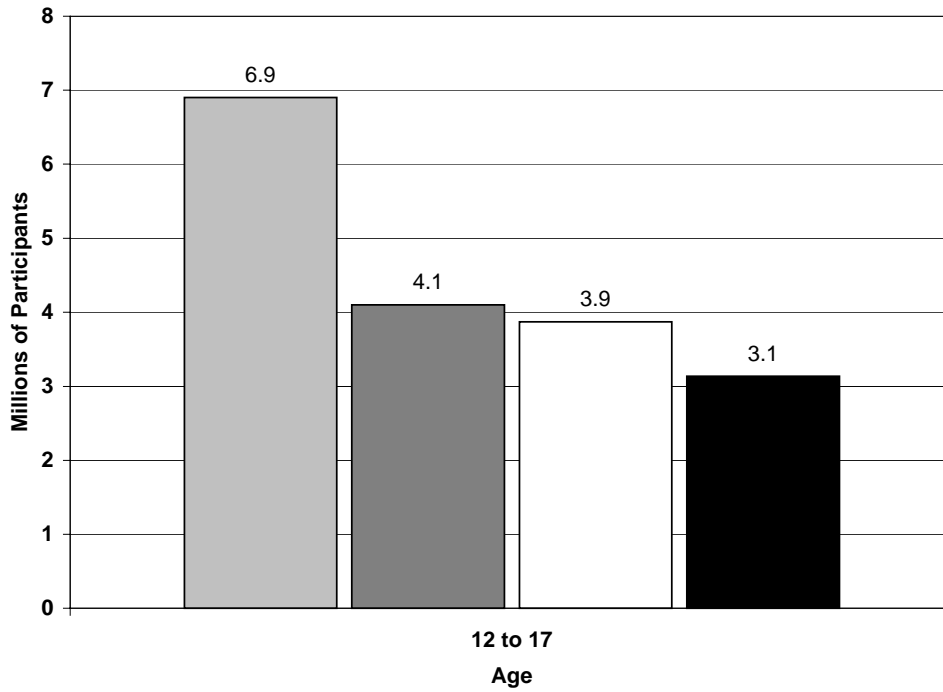
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- Millions of Participants (More Than Once, NSGA) in 1990
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Downhill Skiing Participants (In Millions)



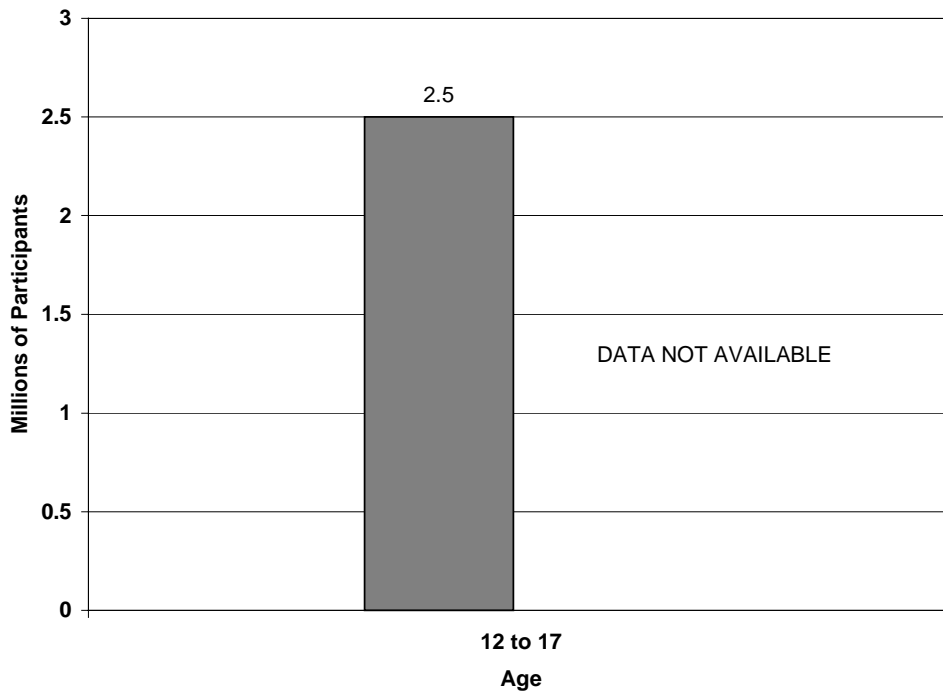
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Fast Pitch or Slow Pitch Softball Participants (In Millions)



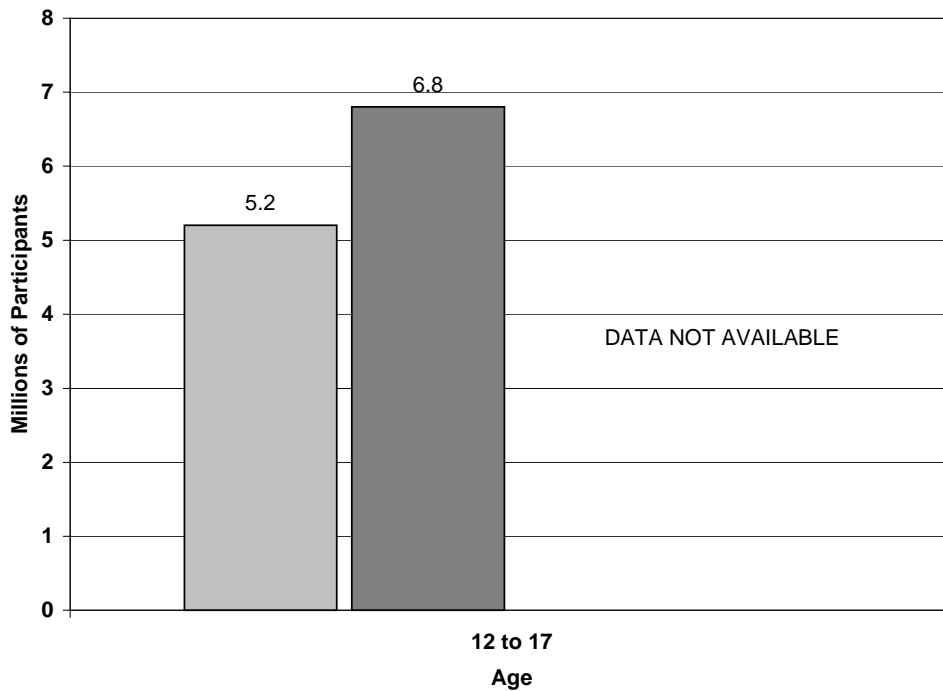
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Fitness Swimming Participants (In Millions)



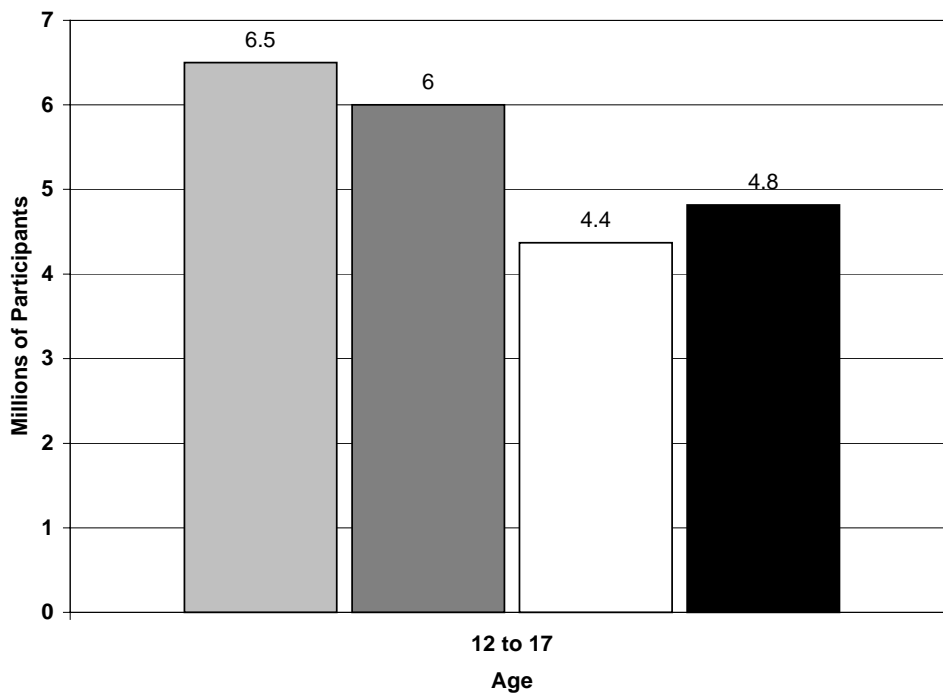
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Free Weights Participants (In Millions)



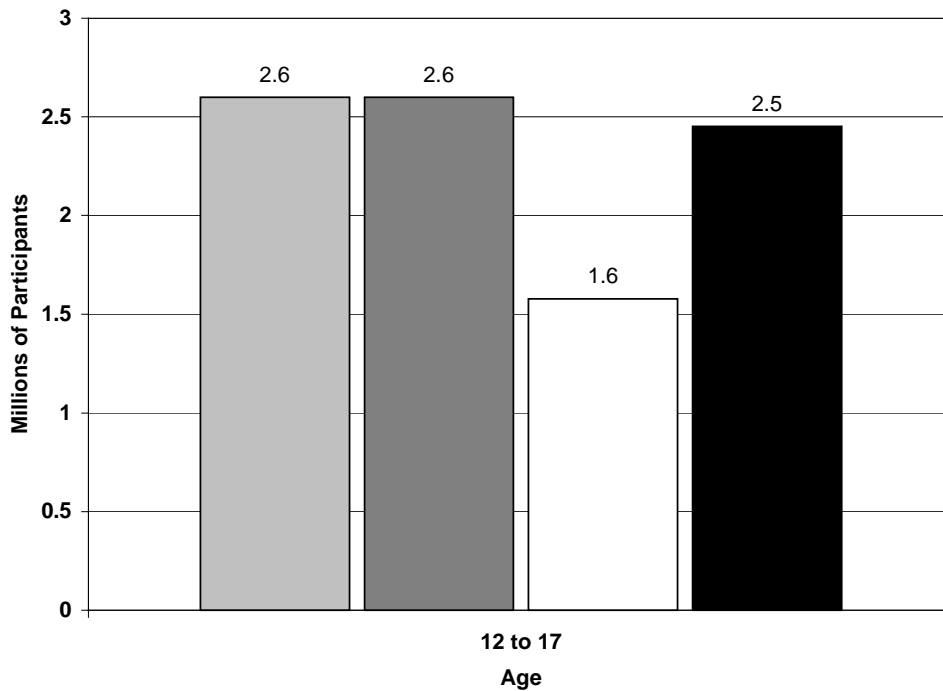
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Freshwater Fishing (Non-Fly) Participants (In Millions)



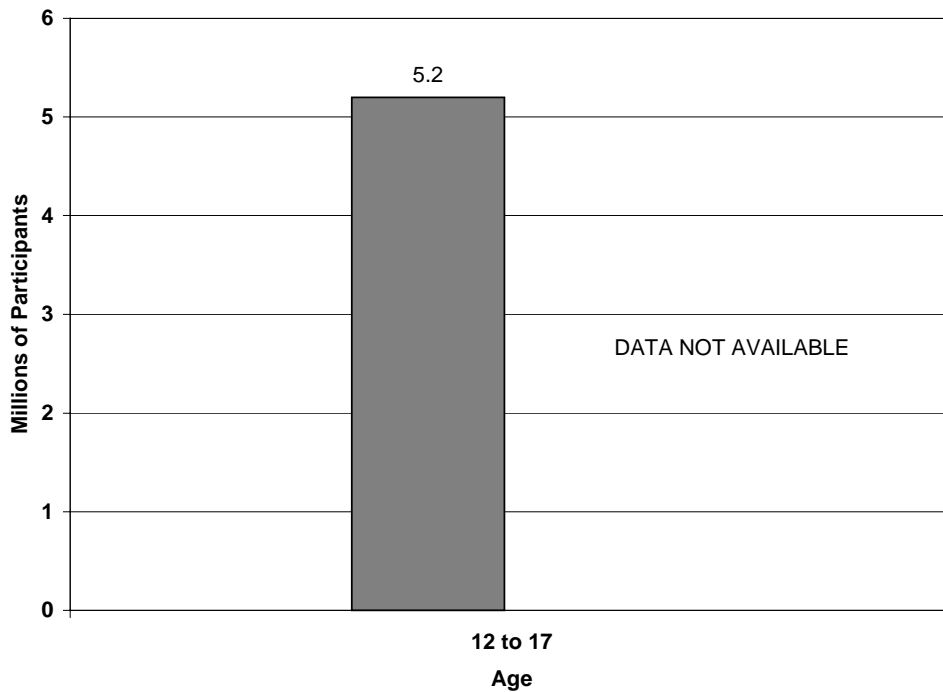
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Golf Participants (In Millions)



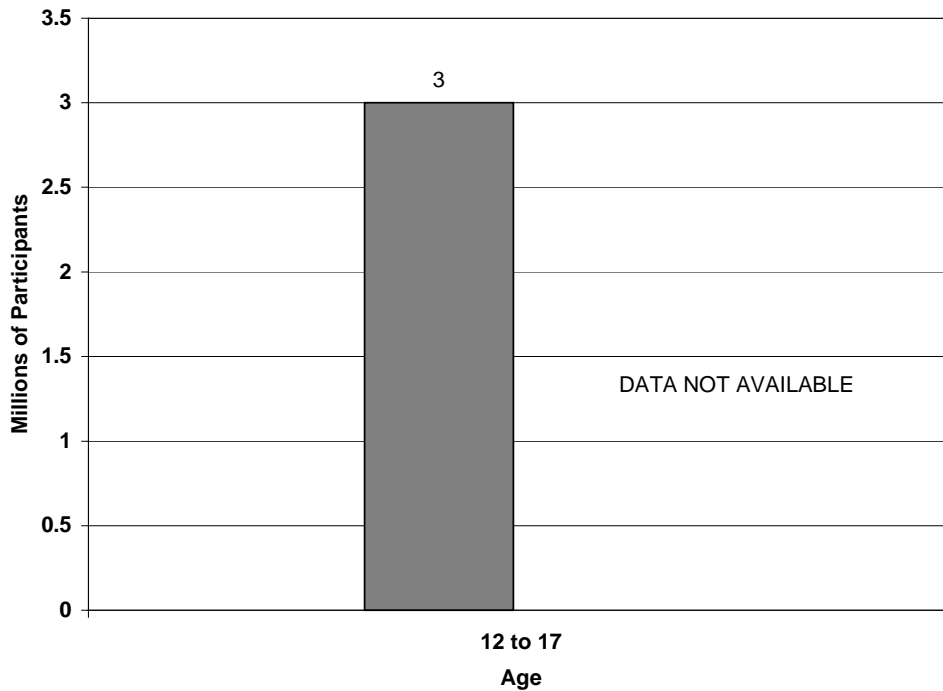
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Hiking Participants (In Millions)



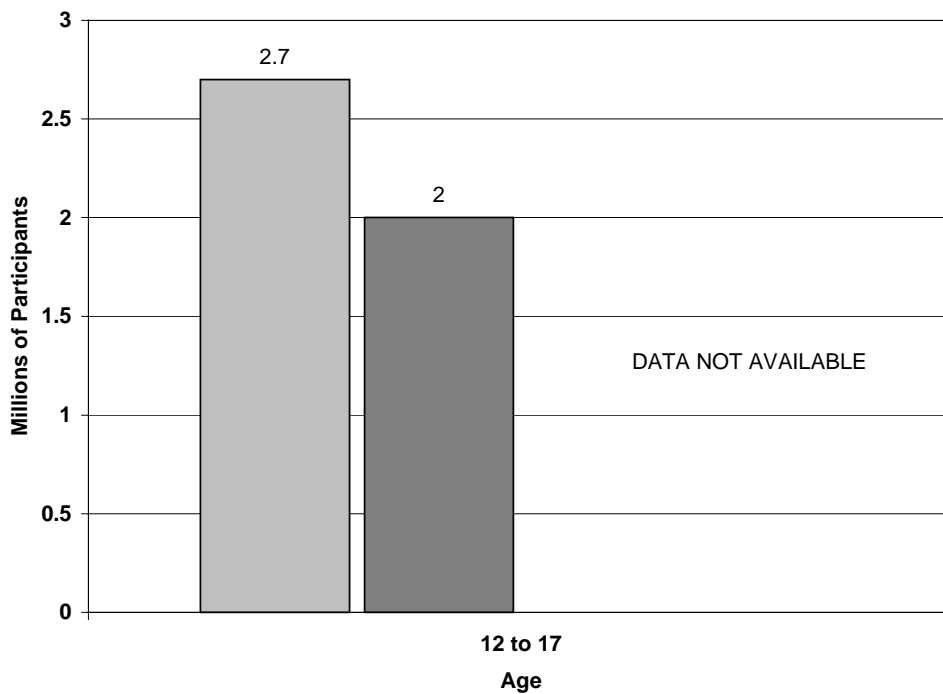
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Horseback Riding Participants (In Millions)



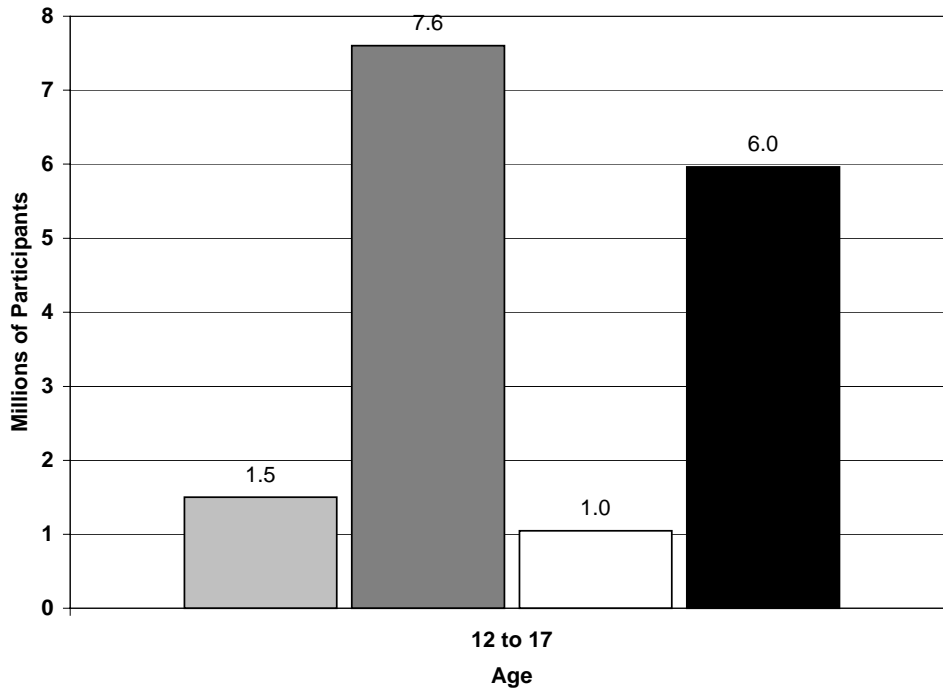
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- Millions of Participants (More Than Once, NSGA) in 1990
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Hunting (With Rifle or Shotgun) Participants (In Millions)



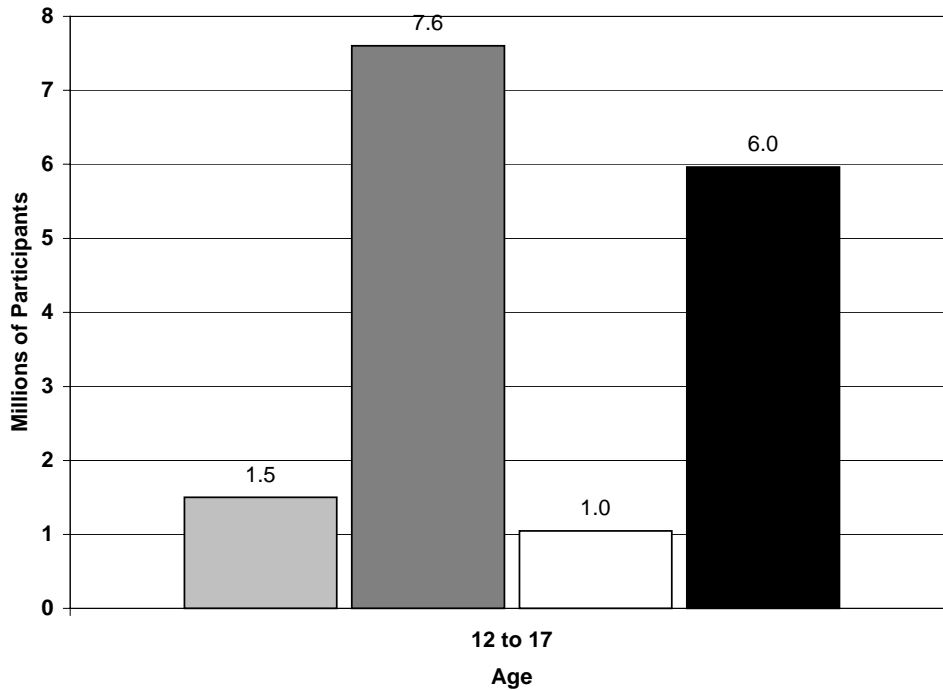
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Ice Skating Participants (In Millions)



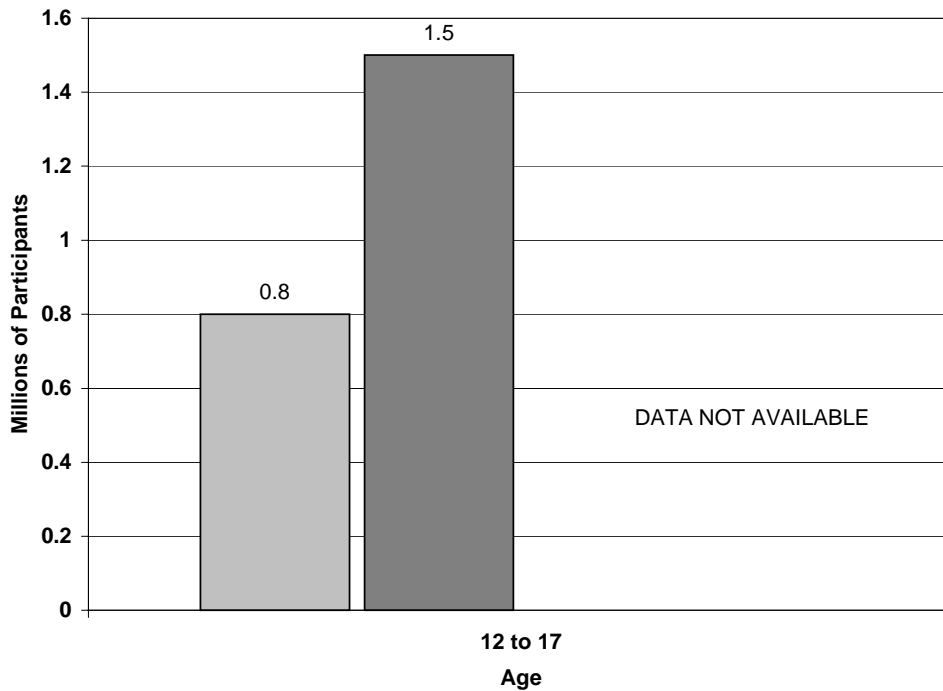
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Inline Skating Participants (In Millions)



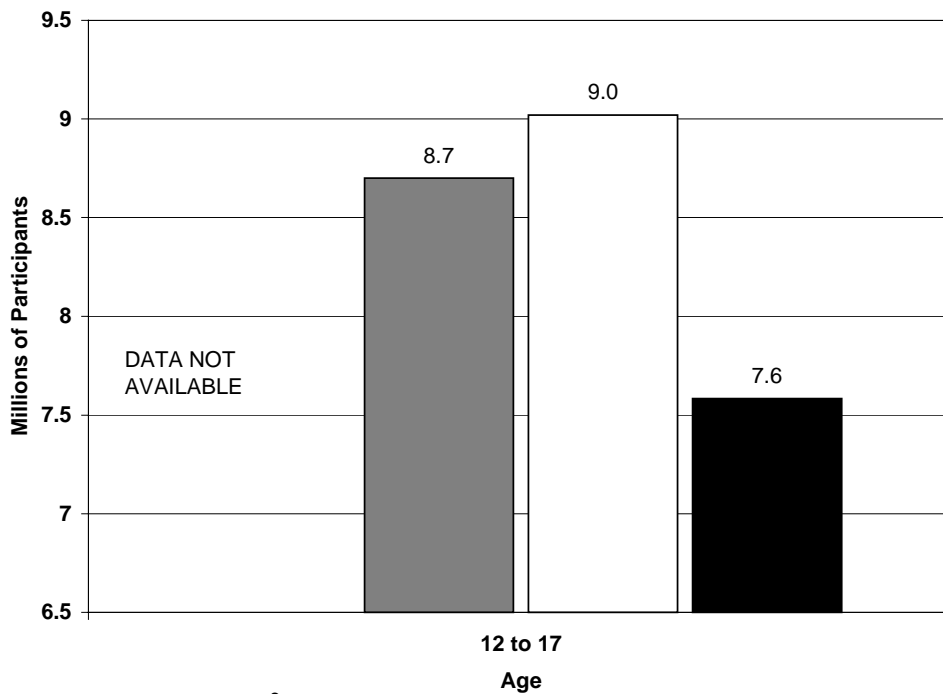
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Mountain Biking Participants (In Millions)



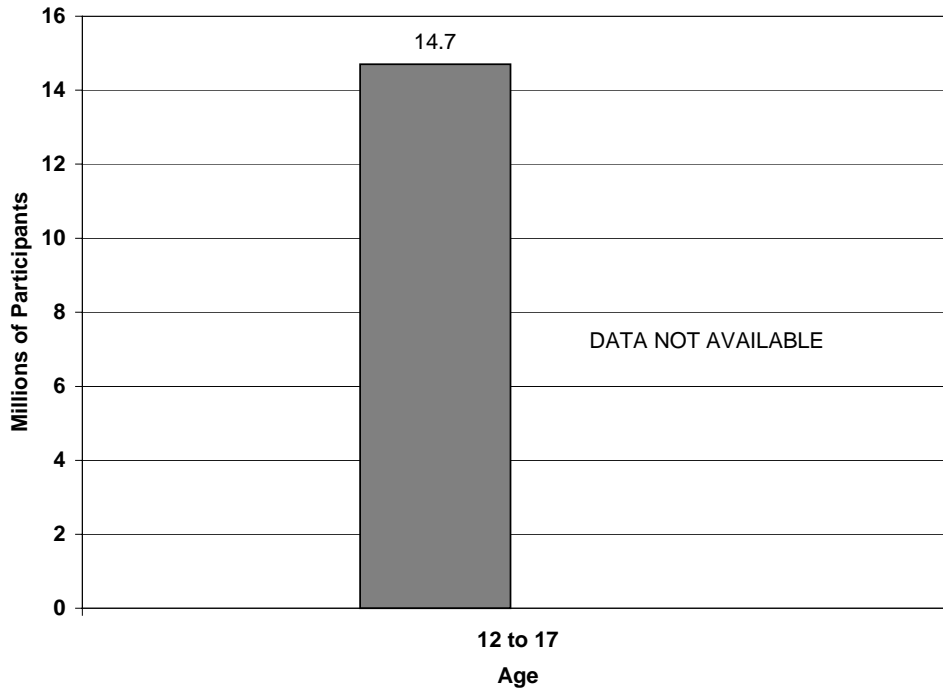
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Recreational Bicycling Participants (In Millions)



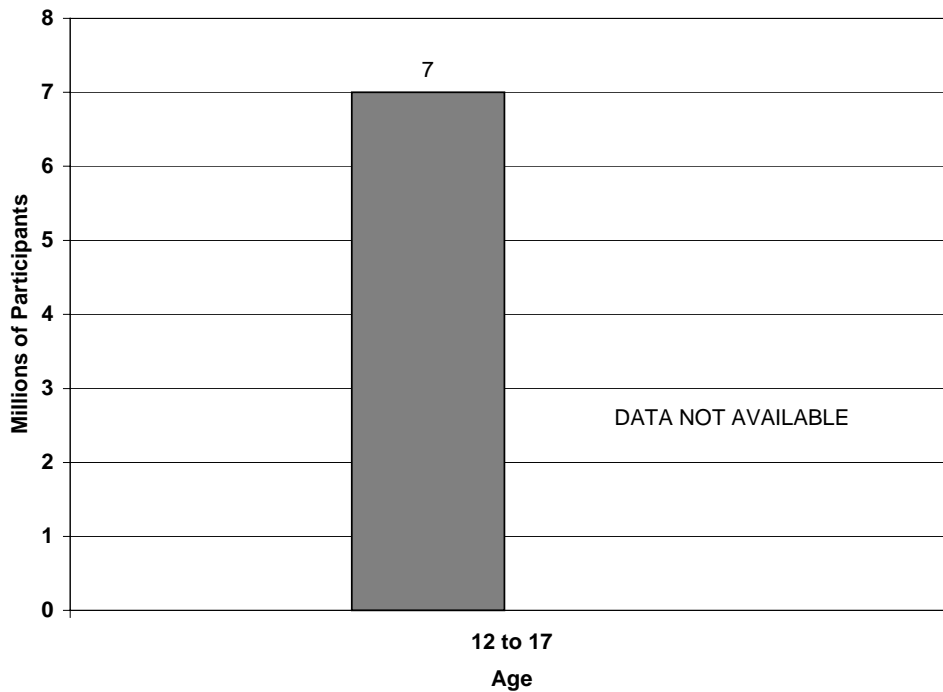
- Millions of Participants (At Least Once, SGMA) in 1990
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- Millions of Participants (More Than Once, NSGA) in 1990
- Millions of Participants (More Than Once, NSGA) in 2000

Recreational Swimming Participants (In Millions)



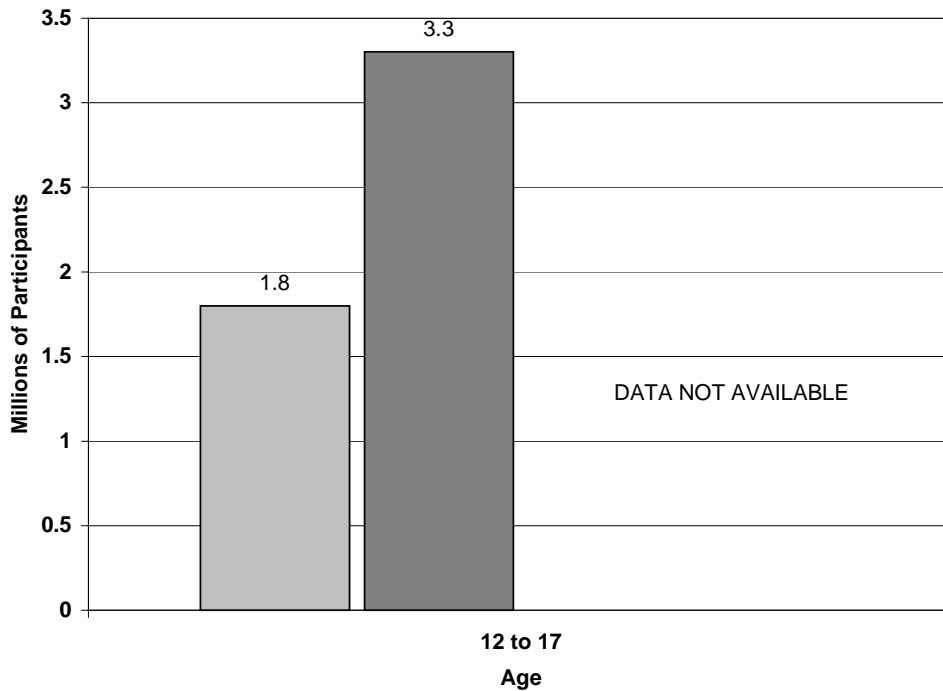
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- Millions of Participants (At Least Once, SGMA) in 2000
- Millions of Participants (More Than Once, NSGA) in 1990
- Millions of Participants (More Than Once, NSGA) in 2000

Recreational Walking Participants (In Millions)



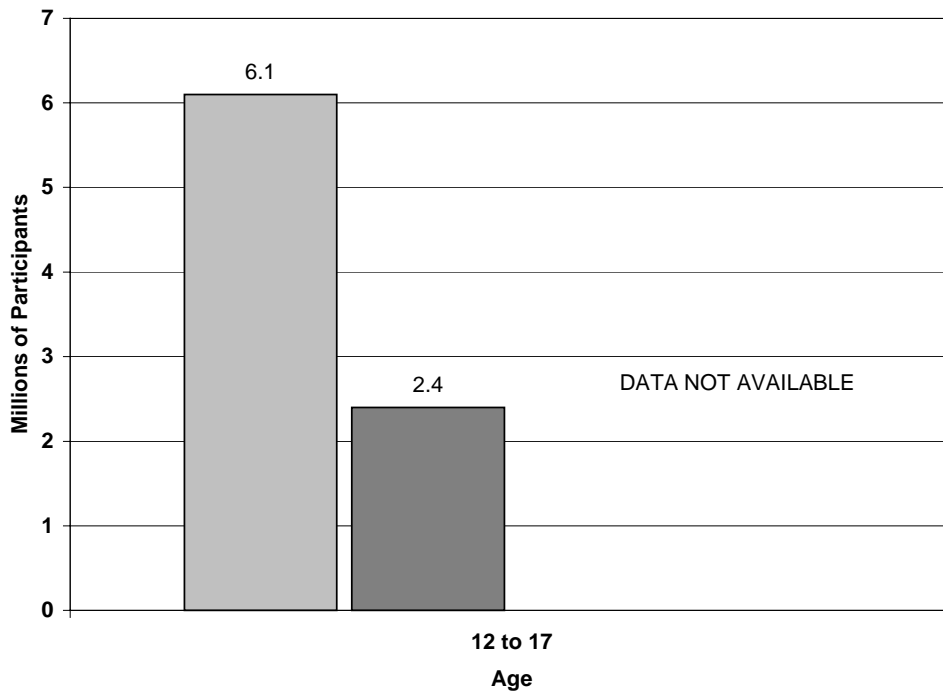
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Resistance Machine Exercise Participants (In Millions)



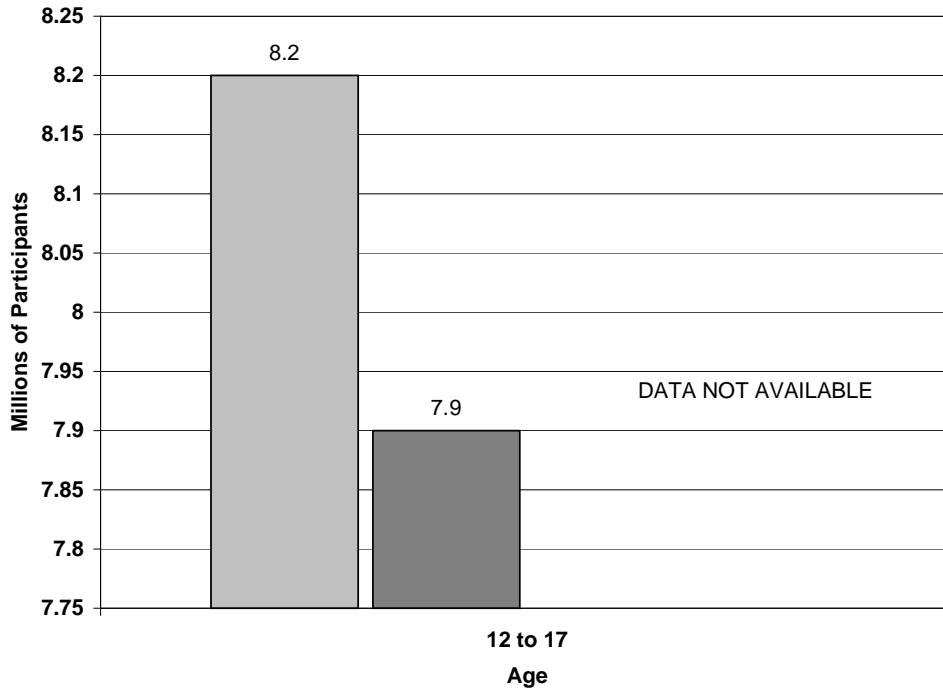
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- Millions of Participants (More Than Once, NSGA) in 1990
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Roller Skating Participants (In Millions)



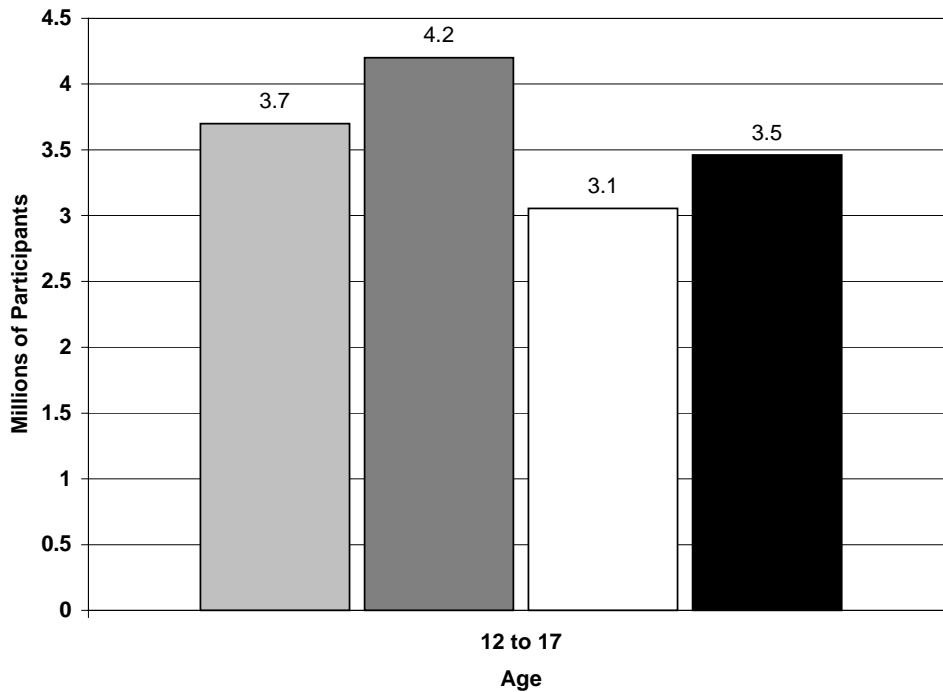
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- Millions of Participants (At Least Once, SGMA) in 2000
- Millions of Participants (More Than Once, NSGA) in 1990
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Running/Jogging Participants (In Millions)



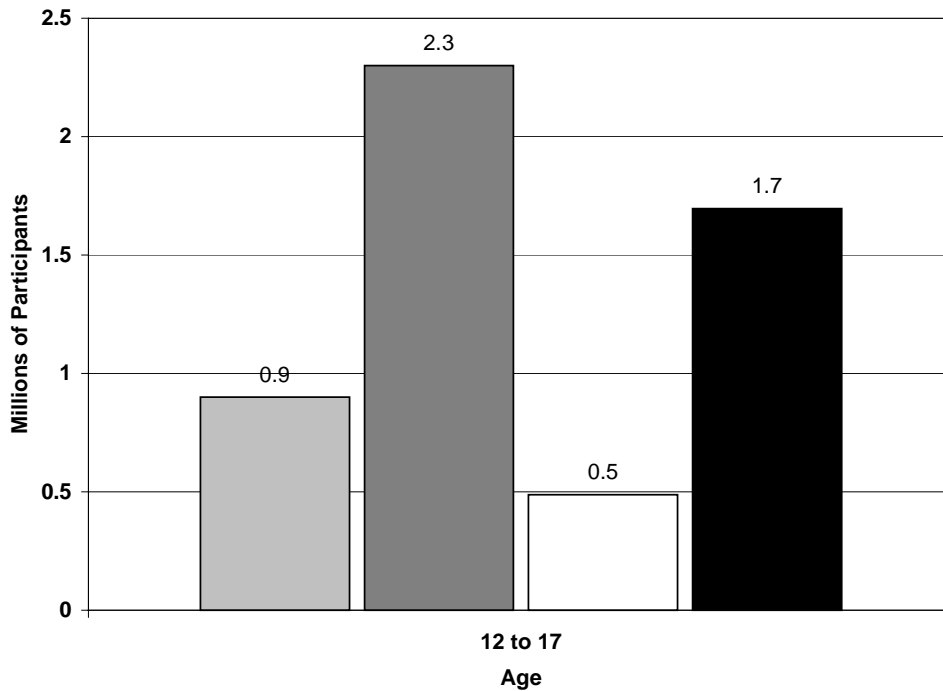
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- Millions of Participants (More Than Once, NSGA) in 1990
- Millions of Participants (More Than Once, NSGA) in 2000

Skateboarding Participants (In Millions)



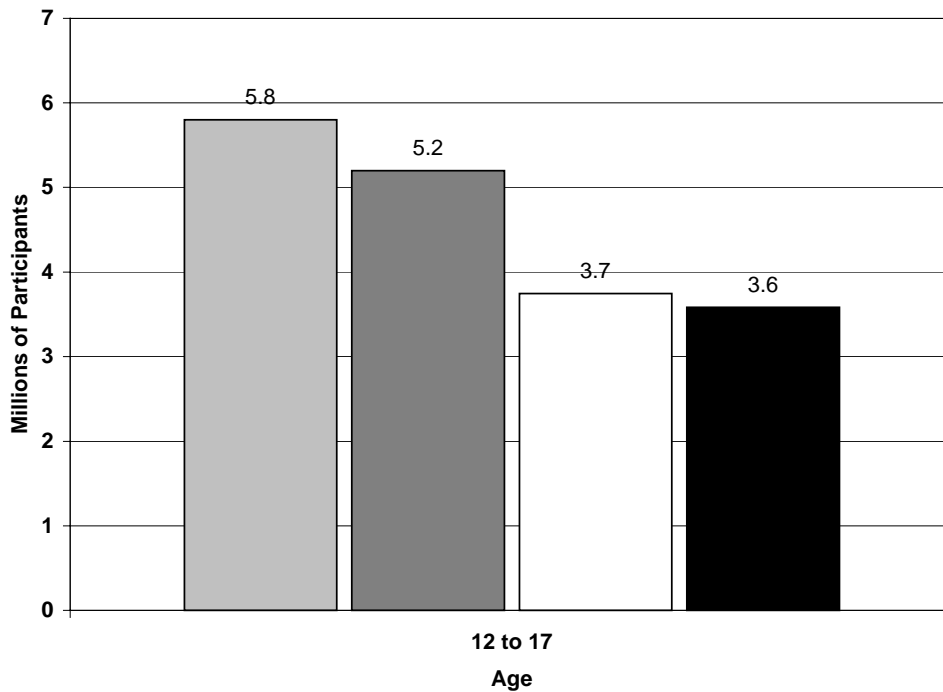
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Snowboarding Participants (In Millions)



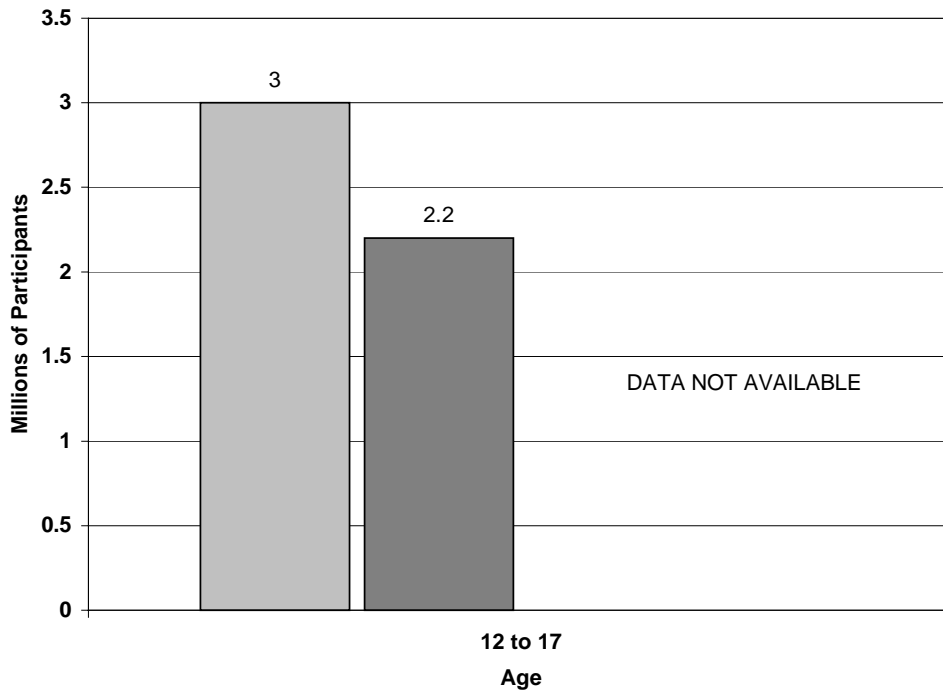
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- Millions of Participants (More Than Once, NSGA) in 1990
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Soccer Participants (In Millions)



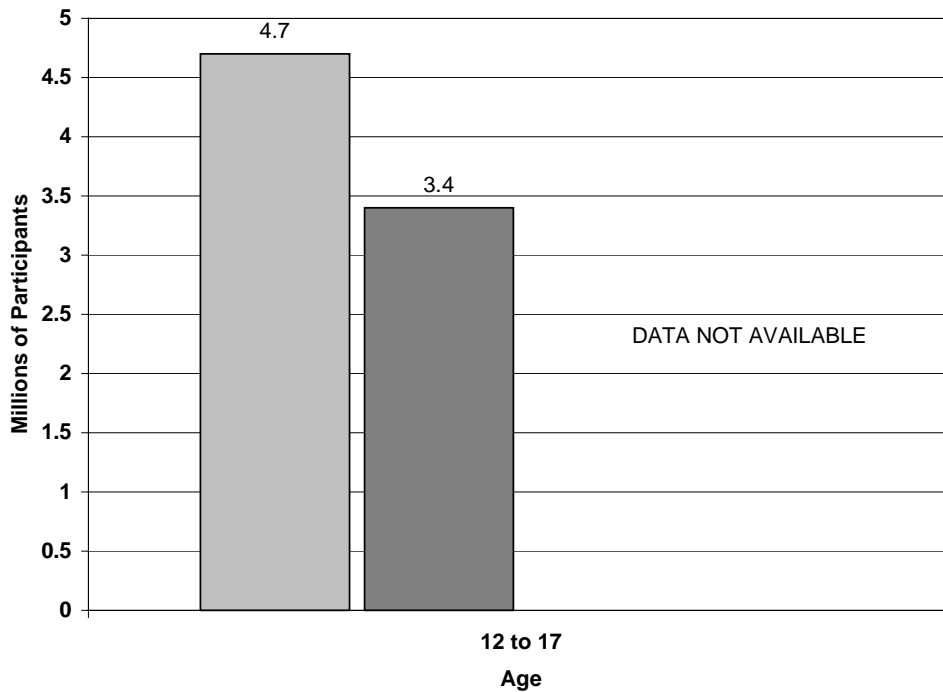
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Stationary Bicycling Participants (In Millions)



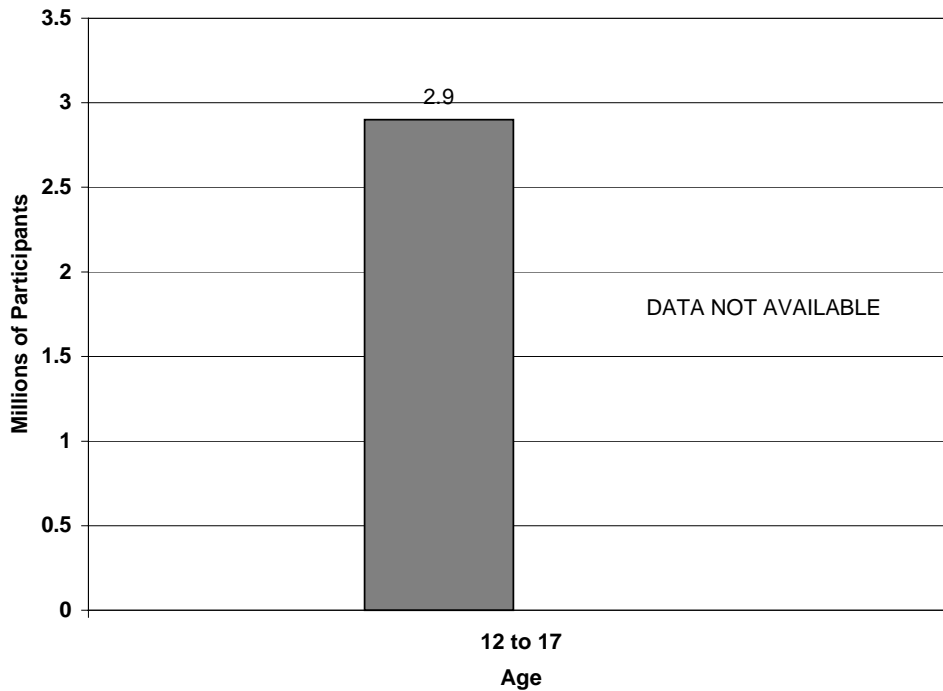
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- Millions of Participants (At Least Once, SGMA) in 2000
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- Millions of Participants (More Than Once, NSGA) in 2000

Table Tennis Participants (In Millions)



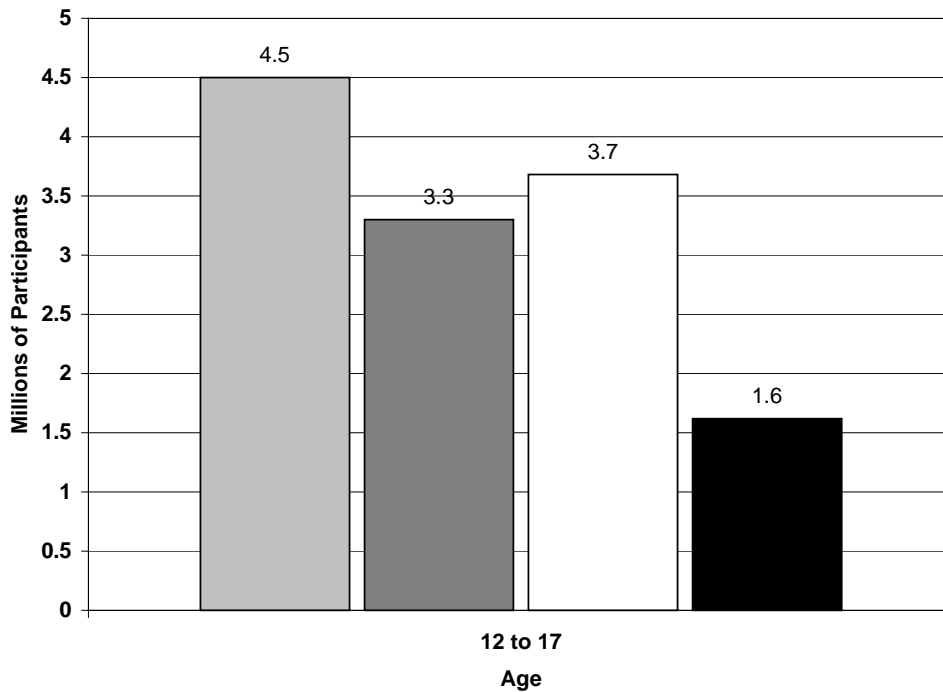
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- Millions of Participants (At Least Once, SGMA) in 2000
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Tackle Football Participants (In Millions)



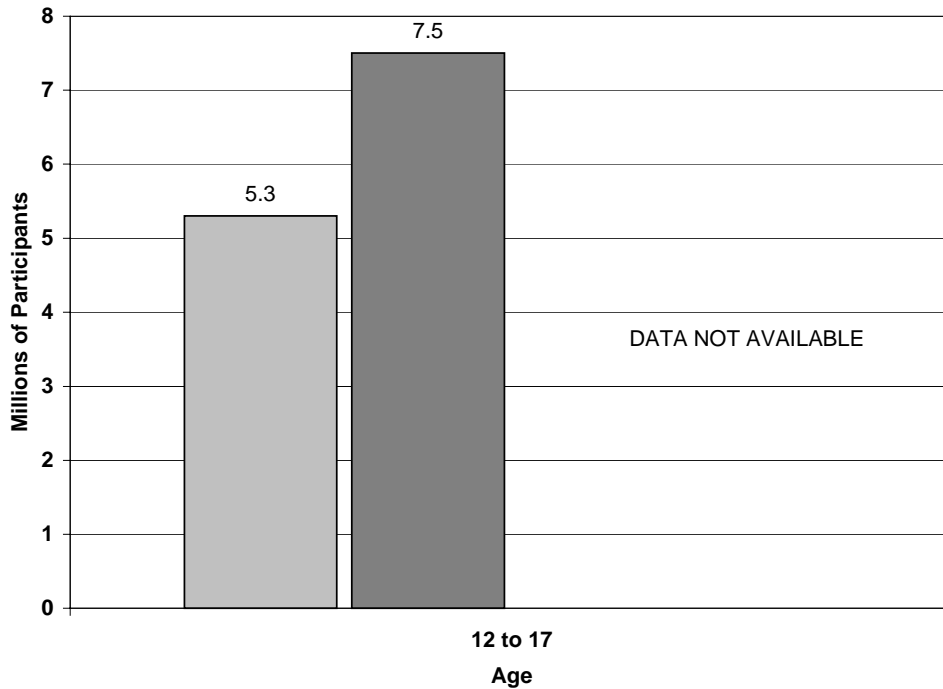
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Tennis Participants (In Millions)



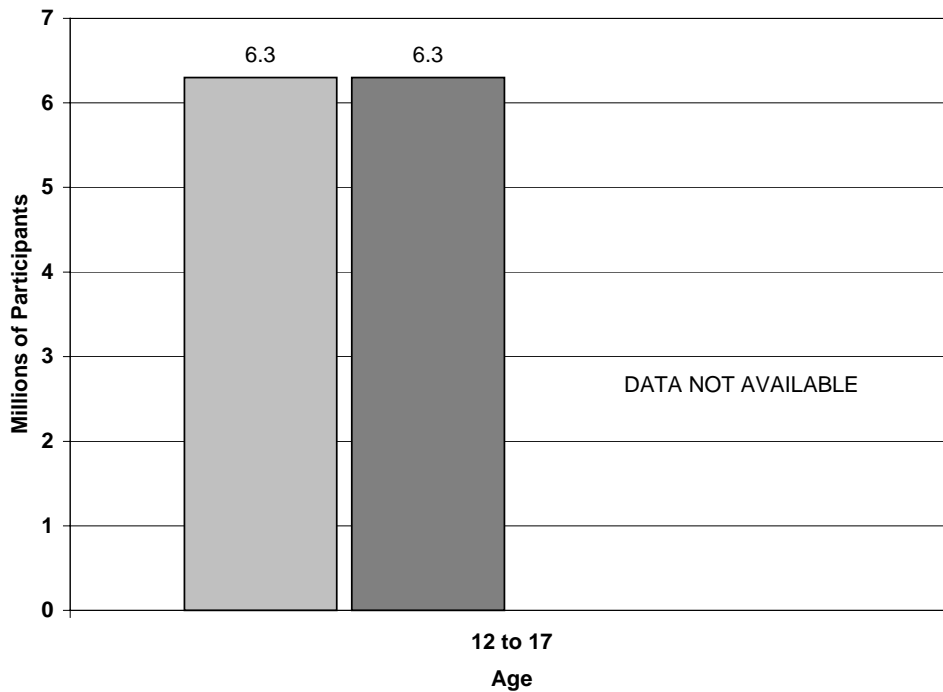
- Millions of Participants (At Least Once, SGMA) in 1990
- Millions of Participants (At Least Once, SGMA) in 2000
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- Millions of Participants (More Than Once, NSGA) in 2000

Tent Camping Participants (In Millions)



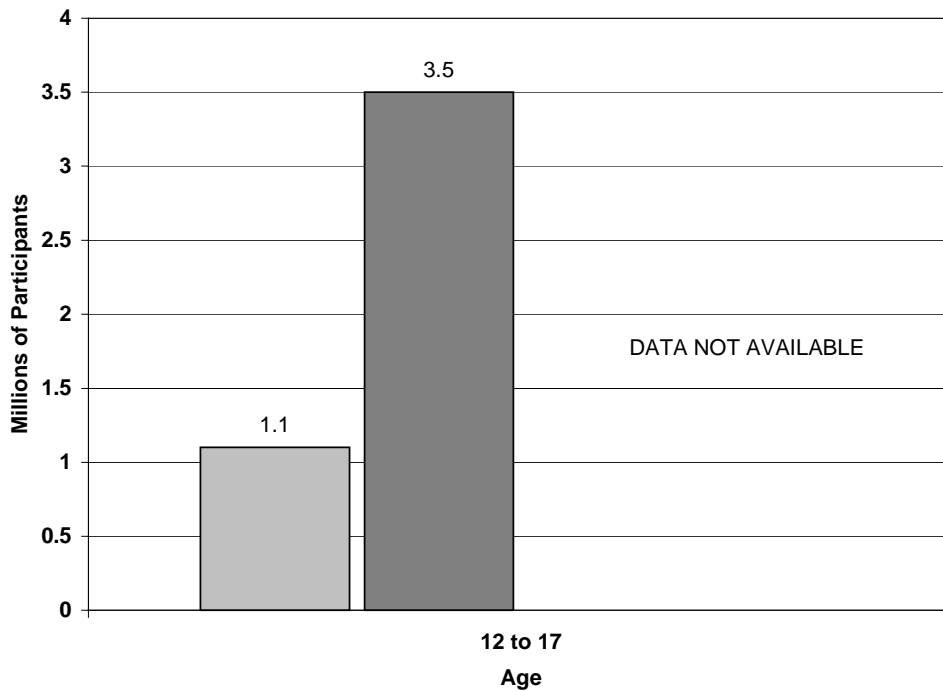
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- Millions of Participants (More Than Once, NSGA) in 2000

Touch Football Participants (In Millions)



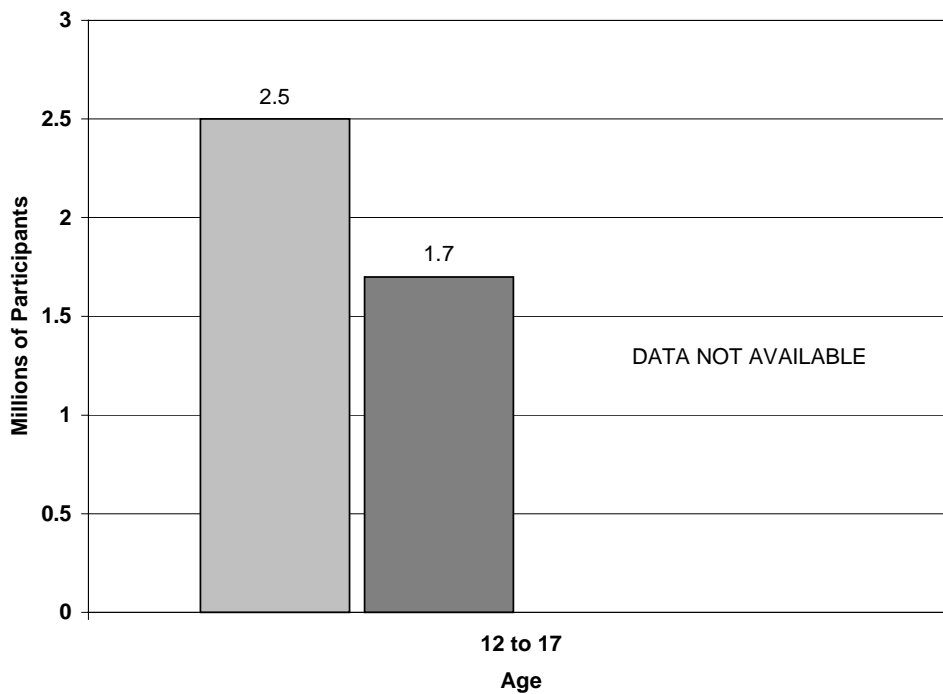
- Millions of Participants (At Least Once, SGMA) in 1990
- Millions of Participants (At Least Once, SGMA) in 2000
- Millions of Participants (More Than Once, NSGA) in 1990
- Millions of Participants (More Than Once, NSGA) in 2000

Treadmill Participants (In Millions)



- Millions of Participants (At Least Once, SGMA) in 1990
- Millions of Participants (At Least Once, SGMA) in 2000
- Millions of Participants (More Than Once, NSGA) in 1990
- Millions of Participants (More Than Once, NSGA) in 2000

Water Skiing Participants (In Millions)



- Millions of Participants (At Least Once, SGMA) in 1990
- Millions of Participants (At Least Once, SGMA) in 2000
- Millions of Participants (More Than Once, NSGA) in 1990
- Millions of Participants (More Than Once, NSGA) in 2000

Youth Participation in Hunting and Fishing

Research has shown that youth hunting and fishing participation has remained steady or declined over the past decade. Although hunting and fishing participation has remained steady between some years, it is important to note that participation has declined overall (SGMA 2001). For example, a study released by the SGMA in 2001 shows that the participation rate by youth 12-17 years old in freshwater fishing declined by 8% between 1990 and 2000. Hunting participation for the same age group declined by 26% between 1990 and 2000 (SGMA 2001).

Millions of Teens 12-17 years old who Participated at Least Once

Sport	1990	1993	1997	1999	2000	Change: '90-'00
Freshwater Fishing	6.5	6.9	6.4	6.6	6.0	-8%
Hunting	2.7	2.8	2.2	2.3	2.0	-26%
Tent Camping	5.3	5.4	6.4	7.1	7.5	+42%
Mountain Biking	0.8	1.1	1.2	1.7	1.5	+88%

Source: American Sports Data, Inc.

Freshwater Fishing: does not include fly fishing

Although the research shows that hunting and fishing appear to have declined, the SGMA study also showed that the participation rates of some outdoor recreational activities increased between 1990 and 2000 by youth aged 12-17. As seen in the previous table, tent camping increased by 42%, and mountain biking increased by 88%.

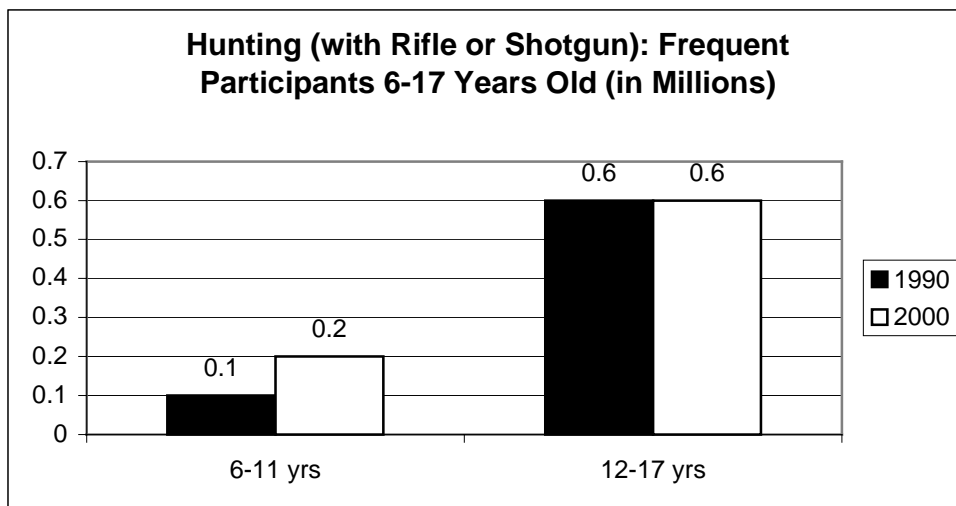
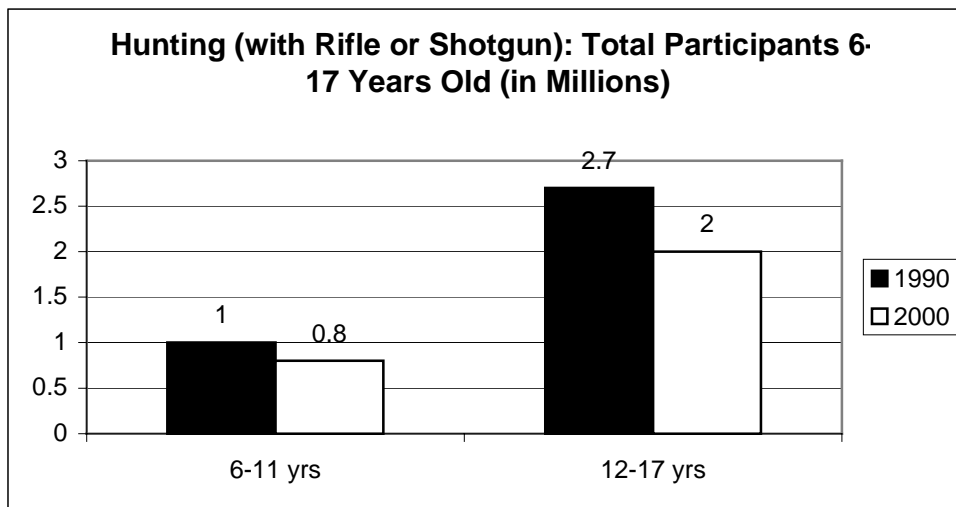
Youth Participation in Hunting

The National Survey of Fishing, Hunting and Wildlife-Associated Recreation found in 1980, there were 354,000 youth between the ages of 6 and 15 who hunted (U.S. Department of the Interior, Fish and Wildlife Service 1980). In 1985, that number dropped to 278,000 (U.S. Department of the Interior, Fish and Wildlife Service 1985). In 1991, there were 221,000 youth hunters 6-15 years old and another 188,000 hunters in the 16-17 year age group (U.S. Department of the Interior, Fish and Wildlife Service 1991). In 1996, there were 30,000 youth hunters 9 to 11 years old and 176,000 youth hunters 12 to 15 years old (U.S. Department of the Interior, Fish and Wildlife Service 1996). There were 169,000 youth hunters 16-17 years old in

1996 (U.S. Department of the Interior, Fish and Wildlife Service 1996). The number of hunters aged 6-8 years could not be calculated due to a small sample size.

On average 7-9% of all age groups between the ages of 16 and 54 hunted in 1996 (Brown 2000). Fewer young hunters are hunting and current hunters are continuing to hunt later in life. Kelly (1987) as reported by Brown (2000) found that between the 1970s and the mid-1980s, there was a 30% decline in the number of young hunters participating in the sport.

As seen in the previous table, hunting participation by youth 12-17 years old has decreased by 26% between 1990 and 2000 (SGMA 2001). This study also indicated that preteen youth hunting participation (6-11 year olds) has declined, from 1 million participants in 1990 to 0.8 million in 2000. Interestingly, the SGMA report found that the number of *frequent* hunters remained about the same and actually increased slightly for preteens 6-11 years old, as seen in the following graphs.



Responsive Management conducted a survey in 1997 for the U.S. Fish and Wildlife Service that asked youth 13-20 years old who had hunted or were interested in hunting if they expected their hunting activity to increase, decrease, or stay the same over the next 5 years. These self-specified projections do provide information on interest and commitment of youth to hunting. Over half (49%) said they expected their hunting activity to increase. Over a third (39%) said they expected their hunting activity to stay the same, and 19% said they expected their hunting activity to decline (Responsive Management 1997).

Youth Participation in Fishing

Fishing is a popular activity among youth. Kellert and Westervelt (1983) examined children's attitudes, beliefs, and behaviors concerning fish and wildlife. In a study of Connecticut schoolchildren, the authors noted:

Fishing was the third most frequently reported activity. Eighty-seven percent of the children said they had fished at some point in their life, and 85% fished in the past two years. Fishing was also the most popular wildlife-oriented activity in Pomerantz's study of 12-18 year-olds, and 78% of LaHart's 13-14 year-old sample went fishing the previous year. The 1980 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation reported fishing among only 30% of 6-15 year-olds in Connecticut. White males and rural children were significantly more likely to have gone fishing. Eleventh graders were least likely to have fished in the past two years, and the decline in fishing activity from 8th grade to 11th grade was quite pronounced. Pomerantz reported a similar difference in fishing among 7th and 12th graders. Children who fished had significantly higher wildlife knowledge scores and significantly lower negativistic scale scores than those who did not fish.

Westervelt and Llewellyn (1985) examined children's attitudes, beliefs, and behaviors concerning wildlife. The sample, which was drawn from over 15,000 5th and 6th grade respondents to a Wildlife Survey published nationally in *Weekly Reader* periodicals, reflected the demographic composition of that readership. The authors noted:

Among survey respondents, the most popular wildlife-oriented activity was fishing, reported by an impressive 76% of the sample. Demographically, boys and children living in rural areas were the most likely to participate in this activity as well as many others. Young people living in the Northcentral and Rocky Mountain states reported the most fishing, and they also had the highest level of hunting participation and having a father who hunts.

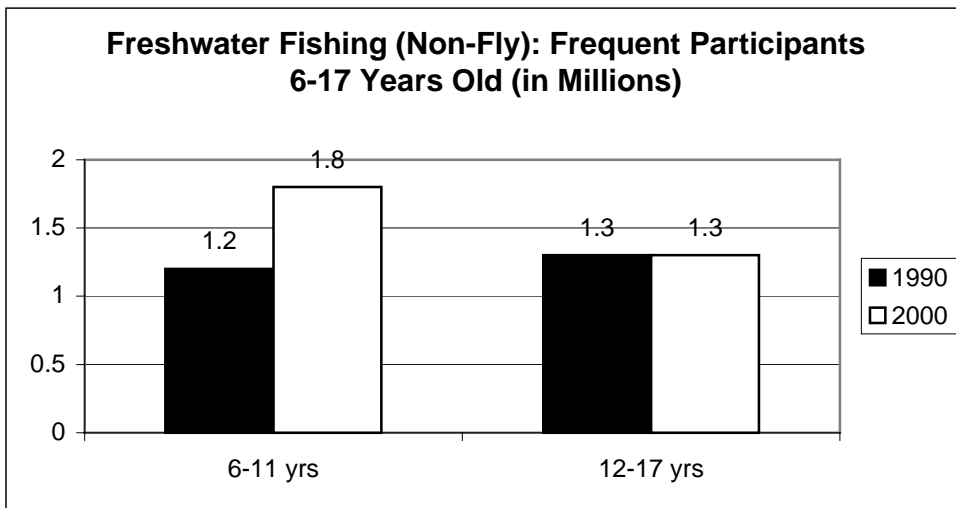
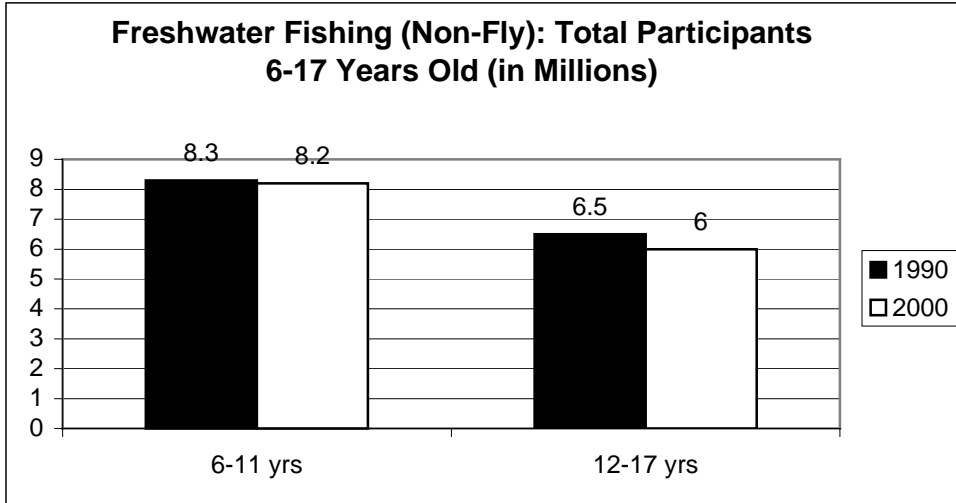
The National Survey of Fishing, Hunting, and Wildlife-Associated Recreation conducted in 1980 showed that 10.2 million youth (6-15) fished (U.S. Department of the Interior, Fish and Wildlife Service 1980). In 1985, 10.8 million youth (6-15) fished and in 1991, 12.3 million youth (6-15) fished (U.S. Department of the Interior, Fish and Wildlife Service 1985; 1991). In

1996, 13.3 million youth fished (6-15) fished (U.S. Department of the Interior, Fish and Wildlife Service 1996).

Responsive Management (2001a) found that in South Carolina, fishing was a nearly universal activity among youth. Ninety-one percent of South Carolina youth had fished sometime in their life, and 62% of South Carolina youth had fished in the previous 12 months (Responsive Management 2001a). Additionally, 53% of South Carolina youth said they would fish more often if they could (Responsive Management 2001a). Fishing (saltwater and freshwater combined) was reported as the second most popular outdoor recreational activity in which youth had participated during the previous 12 months, behind biking. However, when broken down by age, the most popular outdoor recreational activity in South Carolina for youth in grades 9-12 was fishing (Responsive Management 2001a). This study shed some light on participation rates by age:

- Eighty-five percent of youth have fished by the 4th grade.
- Among youth who had fished in the previous 12 months, more youth in the lower grades reported having fished in the previous 12 months.
- Anglers in grades 1-4 fished an average of 8 days per year; anglers in grades 5-8 fished an average of 12 days per year, and anglers in grades 9-12 fished an average of 15 days per year.
- Youth in grades 1-4 were the most enthusiastic about fishing, with 55% reporting liking fishing “a lot,” compared to 48% in grades 5-8 and 41% in grades 9-12 who liked fishing “a lot.” Youth in the higher-grade levels were significantly more reserved in their ratings of liking fishing.
- A greater proportion of youth in grades 1-4 indicated they fished “to catch fish.” As age increased, “to catch fish” became an increasingly unimportant reason for fishing.
- In general, those reasons to fish that had a more naturalistic connotation of “being close to nature” and “to relax” were especially important to higher grade-level youth.

As previously discussed, a study released by the SGMA showed that freshwater fishing among youth 12-17 years old has decreased by 8% between 1990 and 2000 (SGMA 2001). Freshwater fishing participation by youth 6-11 years old also decreased, but by a smaller percentage, from 8.3 million participants in 1990 to 8.2 million participants in 2000 (SGMA 2001).



Summary/Implications

Many issues have been discussed that suggest the reasons for sport participation and for sport attrition in general and in hunting and fishing in particular. One of the larger contextual issues is that sports are a learning environment for children during a critical period when learning is both necessary for its own sake and for the sake of the confidence and social orientation it provides.

Research indicates that children want to learn skills and have fun. Theories suggest that learning builds confidence and the demonstration of ability relative to others leads to self-knowledge. Children are seeking knowledge of themselves in terms of how good they are relative to others, what is appropriate to their peers, their family and their society. Hunting and fishing may or may not have diminished in importance in our general culture during the 1990s, but they can certainly provide a culture of confidence and important skill feedback to children by providing the social support and training that children need to continue participating in any sport.

It is true that children may reassess their abilities when they become old enough to differentiate effort and ability, and that may lead to attrition from the sport. However, that should not prevent hunting and fishing venues/instructors from providing environments rich in training, social support, and the opportunity for comparative information.

All of these things are important to children. It would appear that the factors to consider in attempting to increase hunting and fishing participation would be best aimed at changing things that are changeable. It is uncertain if dropout does happen between 10 and 12 years of age. It is also possible that hunting and fishing are less important to youth because those sports are not as important to society, to parents, or to peers. Whether these issues are causes of attrition or not, they are factors that are highly resistant to change. It appears that change should target “smaller influences” (such as slight alterations to social/environmental factors) with greater impacts rather than big changes, such as changing the rules of the sport. The smaller influences might involve the provision of surrogate social support in the forms of clubs that accentuate skills, maximize fun, and maximize peer comparisons and interactions. Peer involvement becomes vital with age and supplants information from parents and coaches as children develop.

The following issues may have the greatest importance in the decisions that children make about remaining in sports or dropping out of sports, including hunting and fishing. Children start to drop out at the same age, and the following issues grow in importance to them:

- The differences between ability and effort,
- The importance of their peers as a point of reference, and
- Their place in the culture of: their family, their sport, and/or their peers.

These, and other issues come about in an environment where, socially, few participate in hunting and fishing, so there are few peers as a point of reference; there are few chances to assess personal abilities; there are cultural mores present that are antithetical to gun use; and there is little parental and/or other social support for participation.

Chapter 3: Cognitive Development in Children and How Children Relate to the Natural Environment

Youth relate to the natural environment in different ways through predictable stages of cognitive development. Information on wildlife and the natural environment is not equally useful at all ages; what is salient or ignored, and how a child responds, is expected to vary with age and developmental abilities (Kahn and Kellert 2002). By understanding youths' attitudes, perceptions, and approaches to the natural world, fish and wildlife professionals can develop more effective programs that target youth interest and participation in hunting and fishing.

This chapter begins with a general overview of cognitive development in children and includes a review of research on youth attitudes toward animals and the natural environment. This chapter also discusses the relationship between participation in outdoor activities and youths' knowledge of the natural world. The chapter concludes with ways in which fish and wildlife professionals can utilize information on children's attitudes, behaviors and knowledge of wildlife to foster a stronger identification with the natural world. This, in turn, can be applied to programs aiming to foster interest and participation in hunting and fishing among the nation's youth.

Cognitive Development in Children and Attitudes Toward Wildlife and the Natural Environment

A logical starting point in considering the potential impact of contact with nature in childhood development is to distinguish among kinds of experience children have with natural systems and processes (Kahn and Kellert 2002). Young people's experience of nature, broadly speaking, can be classified in three ways: direct, indirect and "vicarious" experience (Kahn and Kellert 2002). Direct experience involves actual physical contact with natural settings and nonhuman species; indirect experience involves actual physical contact but in far more restricted, programmed, and managed contexts; while vicarious experience occurs in the absence of actual physical contact with the world (Kahn and Kellert 2002).

The taxonomy of cognition developed by Bloom and colleagues (Bloom et al. 1956; Maker 1982 in Kahn and Kellert 2002) can be usefully employed to explore the possible impact of varying forms of experience of nature in children's intellectual development (Kahn and Kellert 2002). This taxonomy identifies six states of cognitive maturation, moving from simple to complex levels of hierarchical and presumably sequential intellectual and problem-solving capacity (Kahn and Kellert 2002):

Knowledge: Understanding facts and terms and applying this knowledge to the articulation and presentation of ideas, developing broad classificatory categories and systems, and recognizing causal relationships.

Comprehension: Interpreting and paraphrasing information and ideas and extrapolating these understandings to other contexts and circumstances.

Application: Applying knowledge of general concepts, ideas, and principles to various situations and circumstances.

Analysis: Examining and breaking down knowledge into elements and categories and discerning underlying structural and organizational relationships.

Synthesis: Integrating and collating parts or elements into patterned, organized, and structural wholes and identifying and generating understandings of relationships and interdependencies.

Evaluation: Rendering judgments about the functional significance and efficacy of varying elements and functions based on careful examination of evidence and impacts.

Evidence suggests that experiential contact with nature can exert a significant impact on cognitive development, especially during the middle childhood and early adolescence (Kahn and Kellert 2002). For example, the Comprehension phase broadly entails the translation, interpretation, and extrapolation of facts and ideas (Kahn and Kellert 2002). Kahn and Kellert (2002:124) state:

In developing this capacity, the child systematically and relationally collates factual understanding with empirical evidence. Encounters with the natural world, both real and imagined, provide a readily accessible context for this assimilation, analysis, and comprehension. The world that the child encounters includes such phenomena as snow falling at only certain temperatures; trees growing in particular climactic conditions but not in other conditions; ducks and geese being found in certain habitats but not in other habitats.... The child confronts, in effect, nearly limitless contexts and opportunities in nature for developing and practicing the act of comprehension.... A process of intellectual competence spirals upward through a matrix of direct, indirect, and vicarious experiences of nature, strengthening the cognitive muscle we call mind and developing and reinforcing the child's capacities for empirical observation, analytical examination, and evidentiary demonstration.

Krathwohl and Masia (1964) as cited in Kahn and Kellert (2002), developed a taxonomy of affective maturation that can be used to identify children's affective and values-related development in middle childhood and adolescence. Five stages of emotional development have been identified by this formulation:

Receiving: Being aware and sensitive to facts and situations involving attentiveness and willingness to receive information.

Responding: Reacting and gaining satisfaction from receiving information and responding to situations.

Valuing: Attributing worth or importance to information and situations that reflect clear and consistent preferences and commitments.

Organizing: Internalizing and organizing preferences and assumptions of worth and importance into consistent patterns and sets of values and beliefs.

Characterization by a value or value complex: Holding general patterns or sets of beliefs and values that constitute a coherent and consistent worldview or philosophy of life.

Finally, there is the consideration of the relation of values of nature to childhood development (Kahn and Kellert 2002). Kellert (1983) developed a typology of attitudes toward animals based on extensive open-ended and closed-ended personal interviews with Americans nationwide. This scale is also useful in describing outdoor recreation satisfactions for youth. Research suggests these nine values differentially emerge at varying ages or stages, somewhat analogous to Bloom et al.'s levels of cognitive and affective development previously described (Lickona 1991; Maker 1982; Piaget 1969 in Kahn and Kellert 2002). Following are the nine attitudes toward animals that Kellert identified: naturalistic, ecologicistic, humanistic, moralistic, scientific, aesthetic, utilitarian, dominionistic, and negativistic.

<u>TERM</u>	<u>DEFINITION</u>
NATURALISTIC:	PRIMARY INTEREST AND AFFECTION FOR WILDLIFE AND THE OUTDOORS.
ECOLOGISTIC:	PRIMARY CONCERN FOR THE ENVIRONMENT AS A SYSTEM, FOR INTERRELATIONSHIPS BETWEEN WILDLIFE SPECIES AND NATURAL HABITATS.
HUMANISTIC:	PRIMARY INTEREST AND STRONG AFFECTION FOR INDIVIDUAL ANIMALS, PRINCIPALLY PETS. REGARDING WILDLIFE, FOCUS ON LARGE ATTRACTIVE ANIMALS WITH STRONG ANTHROPOMORPHIC ASSOCIATIONS.
MORALISTIC:	PRIMARY CONCERN FOR THE RIGHT AND WRONG TREATMENT OF ANIMALS, WITH STRONG OPPOSITION TO EXPLOITATION OR CRUELTY TOWARD ANIMALS.
SCIENTISTIC:	PRIMARY INTEREST IN THE PHYSICAL ATTRIBUTES AND BIOLOGICAL FUNCTIONING OF ANIMALS.
AESTHETIC:	PRIMARY INTEREST IN THE ARTISTIC AND SYMBOLIC CHARACTERISTICS OF ANIMALS.
UTILITARIAN:	PRIMARY CONCERN FOR THE PRACTICAL AND MATERIAL VALUE OF ANIMALS OR THE ANIMAL'S HABITAT.
DOMINIONISTIC:	PRIMARY INTEREST IN THE MASTERY AND CONTROL OF ANIMALS, TYPICALLY IN SPORTING SITUATIONS.
*NEGATIVISTIC:	PRIMARY ORIENTATION IN ACTIVE AVOIDANCE OF ANIMALS DUE TO DISLIKE OR FEAR.

*HYPOTHETICALLY, THE NEGATIVISTIC ATTITUDE CAN BE DIVIDED INTO TWO ATTITUDE TYPES: A

NEUTRALISTIC ATTITUDE REFLECTING A PASSIVE AVOIDANCE OF ANIMALS DUE TO INDIFFERENCE OR LACK OF INTEREST AND A NEGATIVISTIC ATTITUDE REFLECTING ACTIVE AVOIDANCE OF ANIMALS. IN THIS RESEARCH, ONLY ONE ENCOMPASSING ATTITUDE HAS BEEN CONSIDERED.

In a study of 22 schools in Connecticut, Kellert and Westervelt (1983) found that the most common attitude among all children was the humanistic attitude. The authors note, "In general, strong, emotional attachment to individual animals and a tendency toward anthropomorphism were the most typical perceptions of animals among the children studied." The second and third most frequent attitudes were the naturalistic and negativistic. The moralistic attitude ranked fourth and the utilitarian attitude was fifth in overall frequency of occurrence. The dominionistic attitude was relatively uncommon, ranking sixth in frequency of occurrence. The least frequently occurring attitudes were the ecologicistic and scientific. The aesthetic attitude was not tested due to the difficulty in developing an adequate scale in which to evaluate it. Kellert (1984:7) notes, "In the national study of adults, the humanistic attitude was also the most frequent perspective of animals, and the negativistic and moralistic attitudes were similarly popular. The most striking difference in attitudes toward animals among children and adults was the widely varying occurrence of the naturalistic and utilitarian perspectives. The naturalistic attitude was much more common among children, while a utilitarian view of animals was far more typical of adults."

Further, Kellert and Westervelt (1983) found that there was a greater factual knowledge, awareness, and concern for wildlife among male children. Female children were more inclined to oppose subordination and dominance of animals, and females showed evidence of a greater emotional concern for large, attractive, primarily domestic animals. African-American children expressed a greater willingness to subordinate animals, especially in the context of improving human material well-being. African-American children also revealed less affection and general interest in animals, particularly wildlife, which correlates with the humanistic, naturalistic, and negativistic results for this group.

The highest negativistic scores were found among 2nd graders, non-whites, females, and urban children. The lowest negativistic scores were obtained from 8th and 11th graders, rural children, and males. Ecologicistic scores were highest among older children, males, and rural children compared to low scores of 2nd graders and non-whites. Second graders and non-whites had the highest utilitarian scores, while the lowest utilitarian scores occurred among 11th graders and females (Kellert and Westervelt 1983).

Children who learned about animals only in school or who visited zoos obtained relatively low knowledge scores. These two groups also had the highest negativistic scale scores. Kellert (1984) notes, "These activities, thus, appeared to exert little positive influence on children. Most zoological parks continue to fail to go beyond the superficial entertainment toward instilling greater appreciation among children, while most learning about animals in school appears to be so divorced from direct experience with animals and the natural environment that little basic knowledge results." Children who bird watched, belonged to animal-related clubs, and hunted were generally more appreciative, knowledgeable, and concerned about animals, suggesting the positive value of participatory contact between children and animals.

Following up on Kellert and Westervelt's (1983) study on Connecticut schoolchildren, Westervelt and Llewellyn (1985; 1986) studied on a national scale the attitudes, beliefs, and behaviors of 5th and 6th grade students toward wildlife. The researchers studied the humanistic,

moralistic, naturalistic, and negativistic attitudes based on Kellert and Westervelt's (1982; 1983) conclusions that these were by far the most common attitudes toward animals among children.

Overall, Westervelt and Llewellyn (1985) found that respondents expressed more sentimental affection for "loveable" kinds of wildlife than naturalistic interests. The children demonstrated limited knowledge about wildlife, and the majority disapproved of sport hunting, including rural residents, although attitudes were more favorable toward hunting for food.

Westervelt and Llewellyn (1985), like Kellert and Westervelt (1983), found the humanistic attitude to be the most common attitude toward animals among children. The humanistic scale had the highest percentage of scores falling in the high-scoring range, the highest overall mean scores, and the lowest standard deviation, all indicating the wide prevalence of this attitude. Ninety percent of the children disagreed with the statement "love is a feeling people should have only for other people, not for animals." The majority of children (56%) preferred "loveable animals" over "animals that live in the woods," "beautiful animals," and "useful animals." More children agreed (43%) than disagreed (31%) that "wild animals get lonely in the wilderness."

Westervelt and Llewellyn (1985) found high humanistic scores for all demographic groups. Females and urban residents scored very high on this attitude scale. Kellert and Westervelt (1983) also found young females to have particularly high humanistic scale scores. However, they did not find significant differences between urban and rural children for the humanistic attitude.

The moralistic attitude was found to be the second most prevalent attitude among all children studied; however, these findings pertained specifically to hunting. Seventy-nine percent of the children sampled disapproved of hunting for sport, 58% of which disapproved strongly. These results were similar to Kellert and Westervelt (1983) who found 81% of 11th graders opposed hunting for sport. Forty-two percent opposed hunting for food, while 46% supported this type of hunting. Females, urban residents, children living in Pacific Coast states, and those with the highest scores on the moralistic scale were most opposed.

The naturalistic attitude was third in popularity, indicating a moderate level of interest in wildlife among children. Boys and rural residents distinguished themselves as the most wildlife-oriented, while children living in the South were the least wildlife-oriented. Kellert and Westervelt (1983) also found that 11th grade males had the highest naturalistic scores of all demographic groups, but although rural children had consistently higher naturalistic scale scores than other population groups, the results were not statistically significant.

The least frequently expressed attitude was negativistic—the fear and avoidance of animals. This attitude had the lowest mean score, and very few children scored high. Nine percent of the children said they did not like animals near them, 53% disagreed (36% agreed) that most wild animals are dangerous, and 49% disagreed (42% agreed) that they were afraid to touch a snake (Westervelt and Llewellyn 1986).

Westervelt and Llewellyn (1985) compared their national findings with the findings of Kellert (1976; 1978b; 1978c; 1979; 1980a, 1980b; 1996 and Kellert and Berry 1980) and found that sentimental affection for loveable kinds of animals was the most prevalent attitude among both children and adults, although children's humanistic orientation was even greater than that of adults. Adults were slightly more tolerant of hunting for meat (42% of children disagreed that hunting for meat was acceptable, 14% of adults disagreed), but both groups were strongly against hunting for sport (80% of adults disapproved of hunting for a trophy, 79% of children disapproved of sport hunting). The authors (Westervelt and Llewellyn 1985) wrote:

Regarding the attitudes toward sport hunting, the stage of transition appears to be during the three years prior to the 5th grade (ages 8 to 10) when opinions become negative and remain so into adulthood. Later, in the three years following the 5th grade (ages 11 to 13), attitudes about hunting for food become more positive, and they remain that way through adulthood.

Knowledge was positively associated with naturalistic interest. Although a causal relationship between knowledge and attitudes was not demonstrated, a negative correlation between interest and fear of animals suggests the value of dispelling fears about wildlife before attempting to foster among children an interest in learning more about wildlife (Westervelt and Llewellyn 1985).

In Westervelt and Llewellyn (1985), the sample that hunted closely resembled the group that fished—boys, rural residents, and those individuals living in the Rocky Mountains and Northcentral states (the regions used in this study were: Pacific, Rocky Mountain, Northcentral, South, and Northeast). Fishing, hunting, and the expressed ability to identify more than 30 kinds of birds were related in identical ways to all four attitudes and knowledge (humanistic, moralistic, naturalistic, and negativistic). They were positively associated with knowledge and appreciation of wildlife, and negatively associated with sentimental affection for individual animals, fear of wild animals, and opposition to hunting. Casual bird watching was the only behavior that was positively related to all four attitudes. No other behavior was positively related to the humanistic attitude.

Children who did not participate in a wildlife-oriented activity had higher humanistic scores than did other behavioral groups. Casual bird watchers, however, had relatively high humanistic scores. Bird identifiers had the lowest humanistic scores. The moralistic attitude (expressed as opposition to hunting) was more characteristic of respondents who did not engage in a wildlife-related behavior. Again, casual bird watchers were the exception (Westervelt and Llewellyn 1985).

The study also found that most wildlife-oriented activity groups were oriented towards the naturalistic attitude. Bird identifiers, animal club members, and hunters had exceptionally high naturalistic scores. Children who watched wildlife television shows such as “Wild Kingdom,” Jacques Cousteau and National Geographic specials on animals had high naturalistic scores. Children not participating in a wildlife-related activity expressed far more fear of wild animals than did wildlife-activity participants. Bird identifiers had the least fear of animals of all behavior and activity groups. Bird identifiers demonstrated the most factual knowledge of wildlife. Frequent watchers of wildlife television shows also had high levels of knowledge of animals. Children who had not watched a wildlife television show were the least knowledgeable group (Westervelt and Llewellyn 1985).

The following table shows the relationships between wildlife-related behaviors, attitudes, and knowledge (Westervelt and Llewellyn 1985). Fishing, hunting, and the expressed ability to identify more than 30 kinds of birds were related in identical ways to all four attitudes and knowledge (Westervelt and Llewellyn 1985). Birdwatching was the only behavior that was positively related to all four attitudes (its negative relationship with the negativistic attitude reflecting a positive orientation to wildlife). No other behavior was positively related to the humanistic attitude (see following table).

Relationships Between Wildlife-Related Behaviors, Attitudes, and Knowledge

	Humanistic	Moralistic	Naturalistic	Negativistic	Knowledge
Fishing	Negative	Negative	Positive	Negative	Positive
Hunting	Negative	Negative	Positive	Negative	Positive
Can identify >30 kinds of birds	Negative	Negative	Positive	Negative	Positive
Bird watching	Positive	Positive	Positive	Negative	
Frequently watching wildlife TV shows	Negative	0	Positive	Negative	Positive
Dad goes hunting	Negative	Negative	Positive	Negative	0
Belonging to animal club	Negative	0	Positive	Negative	0
Keeping live animals in classroom	0	0	Positive	0	Positive
Doing class experiments about animals	0	0	0	Negative	Positive
Zoo visits	0	Positive	0	0	0
Using bird watching book	0	0	0	0	0
School trips to learn about animals	0	0	0	0	0

0=No significant relationship

Westervelt and Llewellyn (1985)

Perhaps the most interesting finding regarding children and the outdoors is that there are varying stages in the evolution of children's perceptions of animals. Kellert and Westervelt's (1983) research of schoolchildren supports the idea that there are varying stages in the evolution of children's perceptions of animals. A major increase in the emotional concern and affection for animals characterizes the period from 2nd to 5th grade. An increase in the factual and cognitive understanding of animals is evident between 5th and 8th grade. The years between the 8th and 11th grade are characterized by a major expansion in ethical and ecological concern for animals and the natural environment.

Kellert (1984) notes that each of these three periods appears to offer varying educational opportunities. The transition from 2nd to 5th grade suggests that educational efforts focus on emphasizing concern for the environment and the natural world. Between 5th and 8th grade, possibilities exist for developing factual understanding of animals, an assertion consistent with the findings of Horvat (1974), Dyar (1975), and Giles (1959). In fact, most researchers agree

that the 7th and 8th grades are the best time to teach children facts about the out-of-doors. Finally, the most appropriate time to foster ethical concern for animals and an understanding of ecology appears to be between the 8th and 11th grades. Kellert (1984) based his conclusions on the following findings:

- Significant age differences were observed on every scale with the exception of the humanistic. Younger children consistently placed the needs of people over animals and expressed minimal concern for the rights and protection of animals.
- Younger children expressed far less interest in animals, particularly wildlife.
- The most profound shift between the 5th and 8th grades was a major increase in factual knowledge.
- 11th graders were far more ecologicistic, moralistic, and naturalistic toward animals than were 8th graders.
- The basic changes among children between the 8th and 11th grade involved major increases in ethical concern for animals, a growing appreciation of wildlife, and an ability to deal with abstract concepts such as ecosystems and biological diversity.

The North American Association for Environmental Education (1999) recommended specific guidelines for differing grade levels based upon sound educational theory. For example, in grades kindergarten to 4th, water sources are taught; in 5th to 8th grades, water treatment is introduced; and in 9th to 12th grades, specific investigations into water quality are initiated. Other environmental education curricula also take this gradual approach to building on learning abilities and development.

Pomerantz (1986) recognized that the first step in developing a systematic and successful approach to fish and wildlife education was to learn about children's cognitive development and apply that information to children's acquisition of knowledge about wildlife and the natural environment. Pomerantz (1986) compared children's perceptions of the natural world with the stages of cognitive and moral development in children. Pomerantz (1977; 1985) found strong evidence in support of various developmental and cognitive stages in children's perceptions of wildlife and the natural world, based on developmental theory and educational practices by Jean Piaget (1929), moral development by Kohlberg (1963) and Kohlberg and Gilligan (1971), synthesis work by Rejeski (1982) to understand the development of children's perceptions of the environment and research on children's knowledge, attitudes and behaviors toward animals by Pomerantz (1977; 1985), Kellert and Westervelt (1983) and Westervelt and Llewellyn (1985). In general, the evidence points to a gradual progression of children's attitudes toward animals from an egocentric to an appreciative perspective as the age of the child increases.



Pomerantz (1986) notes that Rejeski (1982) used Piaget's theory of cognitive development to understand the development of children's perceptions of the environment:

Rejeski outlined three stages of cognitive development in the acquisition of environmental knowledge and understanding of ecological concepts. In the first stage, literalism, which centered around ages 6 to 7, the child was interested in his

immediate environment and had little ability to see himself/herself removed from his physical surroundings. The tree, along with its inhabitants, their homes, and their behavior was an especially important symbol of nature during this stage. Ages 9 to 10 brought the second stage, organization, where children classified and systemically reduced the complexity of the world through natural laws. Nature was seen as an enclosed space, i.e., a pond, forest, or mountain, and children became aware that human intervention might produce deleterious effects on the environment. This is the stage that begins to provide a basis for the land ethic. At age 13 to 14, the moralism stage, children begin to understand the basic ecosystem concepts and explored the link between humans and their natural environment. A sense of moralism is established at this time.

Fishing and Developmental Stages in Youth: A Case Study

A study conducted by Responsive Management on the attitudes and opinions of South Carolina youth 8-18 years old toward aquatic resources and recreational fishing supports the findings by Kellert and others on how developmental stages in children affect how they view nature and wildlife (see table on next page). In the South Carolina study, younger youth enjoyed fishing for the act of catching a fish, while older youth enjoyed fishing as a means to relax and be with friends (Responsive Management 2001a). This corresponds with the previously discussed work by Kellert et al. which shows that younger children are much more egocentric in their perception of the outdoors, while older children are more moralistic, ecologicistic and naturalistic. Although Responsive Management (2001a) found that the interest in increasing factual knowledge about fishing increased as age increased, children in the younger age cohorts still expressed a high level of interest in learning facts about fishing, which differs from Kellert's findings. However, this may be due to a number of things, including increased environmental education in schools and an increased use of the Internet by children of all ages, causing children to be exposed to a wider variety of topics than they otherwise might be through direct experience.

Fishing and Developmental Stages in Youth in South Carolina		
Grades 1-4	Grades 5-8	Grades 9-12
<p><i>Relate to the world in very concrete ways. Egocentric in their perception of the outdoors, placing the needs of people over animals; however, from grades 1-4 there is a marked increase in emotional concern for animals (Kellert and Westervelt 1983).</i></p>	<p><i>Receptive to learning facts about the natural world including biological characteristics and physical parameters. Increase in the factual and cognitive understanding of animals (Kellert and Westervelt 1983).</i></p>	<p><i>More ecologicistic, moralistic, and naturalistic than other grade cohorts. Major expansion in the ethical treatment of animals. Ability to deal with abstract concepts such as ecosystems and biological diversity (Kellert and Westervelt 1983).</i></p>
<p>“To have fun,” was the most popular motivation for why youth go fishing for all grade cohort levels.</p> <p>★ 48% of grades 1-4 ★ 48% of grades 5-8 ★ 40% of grades 9-12</p>		
<p>As grade level increased, the proportion of youth who fished to relax increased. As youth grow older, fishing tends to be enjoyed more for psychological-social and naturalistic reasons. “Being close to nature,” “to relax,” and fishing “to be with friends” were all motivations of older youth.</p> <p style="text-align: right;"></p>		
<p>Younger youth enjoyed fishing more when physical, concrete rewards were associated with the experience. A “hands-on” approach to fishing for young youth produces the highest levels of satisfaction. “Being able to catch fish,” “getting to keep the fish they caught,” and receiving a certificate for attending a fishing event all increased young youth’s satisfaction with their fishing experiences.</p>	<p>As grade level increased, “to catch fish” became an ever increasingly <i>unimportant</i> reason to fish.</p> <p>Increasingly larger percentages of children in the upper grade levels indicated that receiving a certificate would not make any difference.</p> <p style="text-align: left;"></p>	
<p>Differing from Kellert’s findings, many young youth had a desire to improve their factual and cognitive knowledge about fishing. Young youth reported that “learning how to fish safely” would make a fishing event better. Also young youth as well as youth in grades 5-8 had a desire to learn “how to identify fish” and “facts about fish.”</p>	<p>Youth in grades 5-8 exhibited a desire to learn facts about the natural world by “learning how to identify fish” and learning “facts about fish.”</p> <p>Also, although older youth utilized the Internet at a higher rate than did youth in grades 5-8, youth in the middle grade cohort continued to exhibit a high interest in learning about the natural world including biological facts. Youth in grades 5-8 used the Internet considerably more than did other youth to find information on <i>aquatic animals, aquatic habitats, and fishing.</i></p>	
<p>Youth in grades 1-8 were attracted to fishing by the opportunity to learn fishing skills. Interest in fishing increased <i>outside</i> of school by learning <i>fishing skills.</i></p>	<p>Youth in grades 5-8 exhibited an increased desire to improve their skill level as well as their factual and cognitive levels. Learning “how to fish better” would be a positive component to a fishing event or class for this grade cohort.</p>	

Social, Behavioral, and Demographic Factors that Influence Youths' Perception of the Natural Environment

Kellert and Westervelt (1983) reviewed some of the social, behavioral and demographic factors that have been suggested as affecting youths' perceptions of animals and the natural world. The results are important enough to warrant review here:

Relatively few efforts have considered the development of young people's attitudes toward wildlife. The few findings that are available seem to indicate an association between young people's attitudes toward animals and age (Badaracco 1973; Johnson 1974; Morris and Morris 1965; Pomerantz 1977; Sanders 1974), ethnic background (Giles 1959; Horvat 1974; LaHart 1978; Washington 1976), sex (Badaracco 1973; Baird and Tolman 1982; Morris and Morris 1965; Pomerantz 1977; Rohlfing 1980; Sanders 1974, Shaw 1974), area of residence (Pomerantz 1977; Sanders 1974), knowledge of animals (LaHart 1978; Pomerantz 1977; Shaw 1961), symbolic perceptions of animals (Badaracco 1973; Bart 1972; Johnson 1974; LaHart 1974, Morris and Morris 1965; 1996; Morris 1967), participation in animal-related activities (Baird 1982; LaHart 1978; Pomerantz 1977; Sanders 1974), instruction in animal-related courses (Baird 1982; Kress 1975), television (LaHart 1978; Pomerantz 1977; Washington 1976), parents and movies (Pomerantz 1977).

Unfortunately, it is difficult to arrive at a comprehensive understanding of how these different variables influence young and growing children's perceptions of animals because of the variations in the size and characteristics of sample populations in these studies, their use of widely varying methodologies and the diversity of research focus.

Age

Insufficient data exist on the development of attitudes toward wildlife from childhood to adulthood because most research has focused on high school students or very young children. Systematic investigations of a wide age range have been carried out by Badaracco (1973) and Johnson (1974). When Badaracco examined grades one through twelve for preference in aspects of the natural environment, reptiles and insects dropped significantly in preference among older children. Age was also a crucial variable in Johnson's study on attitudes toward wolves. Children under ten years of age were the most negative toward the wolf, and views of people over thirty most closely resembled those of the under ten age group.

Regarding concern for animal welfare problems, 8th graders appeared to care more than 12th graders (Pomerantz 1974).

A more extensive understanding of how environmental attitudes develop in children has been reported by Dyar (1975). In her attempt to identify an age group when environmental education might be most influential, she relied on

political socialization literature, building on the notion of critical developmental periods in life. She chose to study 7th grade students because, according to the political socialization literature, most political learning occurs at the pre-high school level (Hess 1967), political interest peaks in the 7th or 8th grades and becomes firmly established around that time (Easton 1970), and political attitudes about 'community' remain fairly constant from age 14 to high school (Adelson and O'Neill 1966).

In terms of attitudes toward the environment and animals, evidence exists to support Dyar's (1975) notion of a critical period around the junior high school years. An increase in the stability of environmental attitudes as children grow older has been reported by Horvat (1974) who found that environmental orientations of 8th graders were more stable and internally consistent than those of 5th graders. Giles (1959: 497) reported that most dramatic increases in conservation knowledge scores occurred between grades seven and nine, and concluded, "Conservation can be most efficiently and effectively taught in grades seven, eight and nine. If one grade is to be considered, grade seven appears to present the greatest opportunities." Concerning attitudes toward wildlife, LaHart (1978: 74) reported, "Attitudes toward consumptive and non-consumptive uses of wildlife appear to be well formed by the time young people reach 8th grade. This implies that programs designed to increase tolerance toward consumptive uses of wildlife should probably be directed at young children." Pomerantz (1977), however, found no significant difference between 7th through 12th graders on the basis of interest in learning about wildlife, anthropomorphic feelings toward animals and participation in a majority of wildlife-oriented activities.

A speculative and theoretical model of how these attitudes develop over the course of one's lifetime has been proposed by Morris and Morris (1965). According to Morris and Morris, there are seven stages of animal reactivity which progress from the 'infantile' phase, when big animals represent parent substitutes, to the 'senile' phase, when there is an intense interest in species struggling for survival. Between childhood and young adulthood, children react more strongly to smaller animals, which are symbolic of infant figures. The 'objective pre-adult' phase follows, when bug hunting, microscopes and aquaria are the subjects of animal interest, and, when the young adult phase arrives, interest in animals is typically supplanted by a concentration on human relations. Although this theory is highly speculative, the research efforts previously described support the basis of Morris' model, that is, these seem to be progressive chronological stages in the development of children's attitudes toward the natural environment.

Sex

Most research suggests young females tend to express greater anti-hunting

sentiment than do young males (Pomerantz 1977; 1980; 1984). Female children also appear to be more sympathetic toward animals (Baird and Tolman 1982), more concerned about animal welfare problems (Sanders 1974) and more anthropomorphic and aesthetically oriented to animals (Pomerantz 1977). A difference between sexes on specific animal preferences was one of Badaracco's (1973) most striking results. Mammals and birds consistently were popular with both sexes but girls in grades one through twelve consistently ranked fish, reptiles, and biting and stinging invertebrates much lower than did boys. Morris and Morris (1965) also found that boys and girls between four and ten years of age dislike spiders equally as much, but as they approached their teens there was a dramatic increase in the girls' and not the boys' negative attitudes toward spiders.

Area of Residence

In our study of adult attitudes toward animals (Kellert and Berry 1980), persons raised in rural areas expressed stronger utilitarian sentiments toward animals, while those raised in cities of at least one million people were more likely to be moralistic. Pomerantz (1977) provides some supporting evidence for this effect in children. As population size increase in her study of 7th through 12th graders, a decrease occurred in the number of hunters, and an increase in the opposition to hunting. Sanders (1974), however, reported that inner city children expressed the least concern for animal welfare problems, and children from the suburbs expressed the most concern.

Ethnic Background

In a variety of source-related recreational activities (e.g., camping, hiking, hunting), except for fishing, participation by young urban Blacks was "noticeably absent" according to Washington (1976) and understanding of wildlife was gained primarily from television shows. Additionally, knowledge of wildlife and the environment has been consistently found to be lower among young Blacks than Whites (LaHart 1978; Giles 1959) and Horvat (1974) reported a lack of concern for environmental problems in urban Black students. One reason, according to Washington, why "wildlife is little more than a vestigial component in the lives of many urban Blacks" (Washington 1976) is the lack of opportunity for meaningful wildlife-related experiences during childhood.

Knowledge of Animals

According to LaHart (1978), a relationship exists between what young people know and feel about wildlife, but the association is not a particularly strong one. Knowledgeable 8th graders were more likely to recognize the importance of lower forms of animal life and preserving endangered species, to have greater tolerance for predators and to oppose the outlawing of hunting. As

previously reported, LaHart also found that 8th graders who engaged in non-consumptive wildlife activities were more knowledgeable about animals than consumptive users. Pomerantz (1977), however, reported the opposite effect. Among secondary school students she studied, more hunters than non-hunters had high knowledge scores, and more non-hunters and hunters had high knowledge scores than anti-hunters.

LaHart (1978) obtained some interesting results on attitudes [that were apparently] not related to knowledge. For instance, both high and low knowledge groups responded similarly to questions about the emotional capacities of animals and the health conditions of wild animals compared to pets. LaHart concluded that, despite varying levels of knowledge about wildlife, young people maintain anthropomorphic attitudes and have little understanding of the laws of natural selection.

Several investigators have demonstrated that males are more knowledgeable about animals than are females (Kress 1975; Pomerantz 1977; Shaw 1961), and whites, children with parents who have a college education, and rural children (Pomerantz 1977) receive comparatively higher scores on knowledge of animal tests.

Symbolic Perceptions of Animals

Morris and Morris (1966) identified 20 anthropomorphic characteristics to account for the popularity of animals like the panda, one of which was size. In childhood, he suggests, large-sized animals are preferred because they “fit the role of the omnipotent parent,” whereas older children are more attracted to smaller animals, like pets, because they fulfill the role of infant figures.

Participation in Animal-Oriented Activities

LaHart (1978: 73-74) found that “[participation in] animal[-related] activities impact attitudes as much as knowledge...” Similar results were obtained by Baird (1982: 12) who reported, “If one were to try to change attitudes, education without an experiential component might not be very effective.

Pomerantz (1977) found young hunters were more active than young non-hunters and anti-hunters in a wide variety of wildlife-oriented activities. Males outnumbered females in hunting, fishing, and catching insects, and more females than males went horseback riding and visited zoos. Differences were also found between rural and urban children, with those from rural areas participating in more animal-related activities.

George (1967) maintains that membership in conservation clubs and nature camp experiences are strongly associated with conservation attitude changes in high school students. Concerning domestic animals, owning a pet appears to

exert a positive influence on animal welfare concerns among high school students (Bart 1972)...and to ease young people's anxieties about other animals and nature (Levinson 1969).

Activities that seem to be helpful to high school students in scoring well on wildlife knowledge tests include biology courses (Cauley and Groves 1974; Giles 1959; Shaw 1961), general science courses (Giles 1959; Shaw 1961), fishing (Giles 1959; Shaw 1961), hunting (Giles 1959; Pomerantz 1977), trapping (Giles 1959), and camping (Cauley and Groves 1974; Giles 1959).

Other Influences

Information is available, however, on the effects of teachers' instruction methods, television, parents, and movies. Direct instruction methods in which children examined the anatomical and behavioral characteristics of live spiders and snakes promoted positive attitudes toward these animals in nine- to twelve-year-olds (Kress 1975). Indirect instruction methods such as slides, movies, and lectures about the anatomy and behaviors of spiders and snakes did not have as profound an influence. Also, the positive attitudes achieved through the direct instruction method generalized to other species of spiders and snakes, and were stable up to six months after instruction.

Television also appears to have a significant effect on how wildlife attitudes are developed. Pomerantz (1977) found that 87% of secondary schoolchildren felt that television influenced their interest in wildlife. According to Washington (1976), Black students who live in metropolitan areas consider wildlife television programs to be the most important factor contributing to their appreciation of wildlife. LaHart (1978) also determined that watching wildlife programs was more important to wildlife knowledge than were hunting or fishing. Finally, parents and movies were chosen as major influences on attitudes toward wildlife by 75% of the children in Pomerantz's (1977) study.

Participation in Outdoor Activities and Knowledge of the Natural Environment

The previous section showed that participation in animal-related activities can influence youths' knowledge of the natural environment. A closer look at the effect of participation in outdoor activities on knowledge is presented here. Independent studies have shown that children who fish, hunt, and birdwatch have much more knowledge of the environment and a much deeper ecological understanding than children who do not participate in these activities. Kellert reported that children who learned about fish and wildlife in classrooms or zoos had the least real knowledge about animals and a poorer ecological perspective than other children. Kellert concluded that learning about animals in schools should be supplemented with direct encounters with animals and natural habitats to impart a deeper understanding of fish and wildlife.

A key finding of the Westervelt and Llewellyn studies (1985; 1986) was the important role played by fish and wildlife-oriented activities in the development of knowledge. For example, it was found that in general, activities exerted stronger influences over knowledge than attitudes did. Active behaviors that required direct involvement with live animals, such as fishing, hunting, and identifying birds, frequently had stronger and more consistent relationships with both attitudes and knowledge than did indirect wildlife-related behaviors such as various school activities and going to the zoo. The obvious implication is that new educational opportunities for direct contact and active involvement with wildlife will have far greater payoffs than continuing to rely on traditional sources of non-interactive contact (Westervelt and Llewellyn 1986).

LaHart and Barnes (1978b) studied the influences of knowledge and animal-related activities on consumptive and non-consumptive resource orientations of 8th graders in Broward County, Florida. They concluded:

While knowledge appears to have some association with resource orientations, knowledge alone is not a particularly important variable. In fact, the results indicate that the frequency of animal activities is more highly associated with consumptive and non-consumptive resource orientations than knowledge.

This association of frequency of animal activity with resource orientation has two implications for educational strategies. First, programs designed to increase knowledge about wildlife and endangered and threatened species may or may not result in attitude changes. The programs clearly must include strong affective components and not simply provide information. Secondly, programs that involve field trips and other types of outdoor activities are as important as cognitive knowledge; experience with the resource counts.

These findings support LaHart (1978) who found that participation in animal-related activities among 8th graders showed the highest association with knowledge of any of the variables he examined. As LaHart (1978) concludes, "Animal activities impact attitudes as much as knowledge, and this supports encouraging wildlife-oriented activities like camping, bird watching, and hunting and fishing as a means of educating young people."

LaHart (1978) concluded that "animal activities impact attitudes as much as knowledge, and this supports encouraging wildlife-oriented activities like camping, bird watching, and hunting and fishing as a means of educating young people." "Reverence and respect are hard to teach," notes environmental educator Dr. Cheryl Riley. "They must follow from seeing, doing and understanding by becoming involved. We cannot expect the voters of tomorrow to support conservation measures if they are not active users of our natural resources."

Educational Implications of Youths' Perceptions of the Natural Environment

When developing programs that target youth, wildlife professionals should consider the various stages of youth cognitive development and learning so that programs can be developed most effectively. For example, focus groups conducted by Responsive Management showed that

young anglers have as wide a spectrum of satisfactions, motivations, values, and socio-cultural needs as their adult counterparts (Bissell and Duda 1995; Duda et al. 1995a; 1999). A wide variation in the needs of youth anglers and hunters exists, and programs should reflect the variation. Several studies suggest ways to target youth of various ages, and these are presented on the following pages.

Responsive Management (1999) found that, for elementary school children who are very egocentric in their perception of the natural world, programs may be more effective if they are focused on hands-on activities. "Allowing children of this age to keep the fish they catch or giving them fishing equipment may be an effective way of increasing their enjoyment of fishing" (Responsive Management 1999).

In addition, children in grades 5-8 are developing their ethical ideas about the environment and have an increased interest in learning facts about the environment. Children in grades 5-8 could be presented with catch and release programs, scientific facts, statistics, animal identification, and skill issues (Responsive Management 1999).

The needs of high school youth revolve around social activities and the lack of involvement in outdoor recreation due to increased pressures on teenagers' time (Kahn and Kellert 2002). In addition, studies have shown that teenagers have a strong inclination for places that depend on the urban infrastructure, but at the same time, they have an appreciation for the natural environment (Kahn and Kellert 2002). Adolescents, compared to younger and older groups, have a lower preference for natural settings and greater appreciation of certain kinds of developed areas. The latter tend to be places that suggest activity and action (Kahn and Kellert, eds. 2002). Several studies have asked adolescents to indicate their favorite places. These have shown remarkable consistency across many countries. In her study in Sunshine, Australia, Owen (1994) found that teenagers preferred more developed, less natural places. When she asked 101 teens (ages 13 through 19, though mostly 14 and 15 year olds) to name three outdoor places they valued within the community, the most frequently selected places were "developed parks" (38%) where they typically went for recreational activities including football, soccer and tennis. The next most often selected were "places at home" such as their own friend's backyard (17%), and "commercial areas" (17%) including the corner stores, downtown pedestrian shopping areas and mall parking lots. Almost all the youths (91%) indicated that they bring others to the place or go because others are there (63%) (Kahn and Kellert 2002).

The Responsive Management study of youth and fishing in South Carolina suggested that programs targeting high school youth focus on the retention of anglers through the promotion of outdoor recreation activities that target already existing social structures such as school, church groups, or other clubs. Older youth need to feel confident that programs targeting their age group have been tailored specifically for their age group and have advanced from those activities targeted toward "younger" age groups. Increased skill issues, specializations, and fishing contests may be effective ways to differentiate between "younger" youth programs and older, high school age youth (Responsive Management 1999).

Programs that make use of peer demonstrations are likely to appeal to all youth but may be especially appealing to older age groups, where the importance of socializing with peers has been made evident. One way that may make demonstrations more effective is to incorporate the students into them (DeMichele unpublished). When students can listen to an instructor's corrective feedback, they can get powerful learning information even by watching an unskilled performance (Hebert & Landin 1994). There are several advantages to peer demonstrators. At any one time, there should be a smaller number of students actually practicing, so there is an

opportunity to give them more attention and better feedback while they do the drill. This is helpful because feedback is very important in the early stages of learning. This method maximizes the active participants' feedback, while the rest of the small group participants are learning by watching their group leader and by hearing the instructor's corrective feedback. This also allows the instructor to observe and vary the pace of the demonstrator switching, and the pace and difficulty of the skill presentation to correspond with class behavior (DeMichele unpublished).

Pomerantz (1985) recognized that it is not possible for all children to get to recreation areas for participatory wildlife-related activities all of the time or even some of the time, "and for children to learn about wildlife and the environment, the schoolroom remains the one constant and most available source of information." Pomerantz (1985) examined the effectiveness of the *Ranger Rick* magazine in promoting environmental and wildlife concern. She found that children who read *Ranger Rick* had significantly higher positive conservation attitudes than those who did not. And although the magazine has been criticized by some for the story-like, potentially anthropomorphic nature of some of its features, the results did not support this claim. *Ranger Rick* readers, as well as the control group of short-term *Ranger Rick* readers, had significantly higher knowledge scores than did children who did not read it, indicating that, "the use of the magazine over a limited period of time in a classroom setting does increase children's knowledge of the natural world." Pomerantz (1985) concludes that the magazine is important because "children can be reached both at home and in school; and for many, it may be their only exposure to the outdoors. The magazine cannot replace hands-on experience with the natural world, but it can serve to open a child's mind to a world otherwise unknown." Pomerantz (1985) concluded that when information about wildlife was presented in a popular, more colorful manner than a traditional textbook on the same topic, a magazine like *Ranger Rick* could have a greater impact on children's acquisition of information.

Responsive Management (1999) conducted focus groups with elementary, middle, and high school youth in South Carolina. The focus groups supported the idea of varied educational schema for different grade-level youth. The Responsive Management study concluded, "...the educational content of angler education for younger grades should focus on basic fishing skills, fishing equipment, and include catching and keeping fish. Middle school students are more interested in naturalistic aspects of fishing and skill issues. High school students have greater socialization needs in fishing and greatly increased skill issues" (Responsive Management 1999).

Based on their findings and those by Kellert and Westervelt (1983), Westervelt and Llewellyn (1985) suggested specific ways in which educators and natural resource managers can utilize information on children's attitudes, behaviors and knowledge of wildlife in order to foster an identification with the natural world, which are presented below. Westervelt and Llewellyn (1985) concluded that wildlife education efforts are likely to have positive impacts if they utilize children's existing orientations toward animals. The authors also concluded that programs should concentrate harder on developing conceptual understandings in younger children of the interrelatedness of life-forms; programs should increase the number and quality of opportunities for very specific forms of wildlife interactions, as well as important indirect sources upon which increasing numbers of urban children rely (Westervelt and Llewellyn 1985):

- **Utilize Humanistic Trends**

In general, it can be concluded that the perceptions of the children in this study toward wildlife were extremely diverse. The wildlife orientations of any one group of children were as different as those of adults, and demographic factors--particularly gender and urban/rural difference--had equally profound effects over their opinions, knowledge, and behaviors. The predominance of the humanistic attitude toward animals in American society exerts considerable influence over the views of these young people but there was also a remarkably large group of children who were strongly oriented toward wildlife in a naturalistic way.

The popularity of the humanistic attitude in the children in this study signifies a major challenge to wildlife professionals. The humanistic orientation exerted a powerful and pervasive influence that knew no regional boundaries and seemed to be unaffected by how knowledgeable the children were about wildlife. Previous research has identified the pervasiveness of this attitude among adults (Kellert 1978a; 1978b; 1978c; 1979). Management activities may need to take into account a growing humanistic orientation that emphasizes the importance of individual animals and attractive species. If there is indeed a trend toward increased humanization, as the research suggests, this challenge to wildlife programs will become even more real as society becomes more urbanized and more young people and females assume policy-making positions.

There are several ways to view the humanistic trend in a positive sense. Creative teaching strategies can be developed that use this basic humanistic orientation toward animals to stimulate interest in wildlife and help young people identify with the natural world. Supplemented with objective information about how wildlife, people, and the environment relate to each other, a broader base of knowledge can be instilled--one that emphasizes sound ecological principles without challenging strongly held humanistic perceptions. Children under 12 relate to animals and the world, in general, in very egocentric, anthropomorphic ways (Blanchard 1982; Bowd 1982; Piaget 1929; Sharefkin 1974). In order for them to understand a related concept such as ecological interdependence, therefore, it should be related to what they feel, objects they see, or phenomena they directly experience. In this way, anthropomorphic understandings of why animals behave the way they do should be utilized to achieve these broader conceptual understandings of the environment.

Using this positive humanistic approach, the learning process can also get started at ages earlier than do most environmental education programs about conservation, pollution, and ecology. Unfortunately, involvement in environmental education programs is currently lowest in the early elementary grades and highest in grades 11 and 12 (Childress 1978) when orientations toward wildlife are already well established. Whereas environmental education typically occurs in high school biology or geology classes (Childress 1978), it also can take place earlier in a variety of other contexts. Because elementary school curricula are rigorously structured around the development of basic skills, wildlife education materials that can be integrated into traditional subject areas may have

more lasting impact than half-hour presentations, films, or supplementary education packets. As Hamilton (1982:248-251) states, "Students can learn to calculate wildlife populations from data in math class as well as they can learn to add or multiply apples and baseballs. In the process, they will indirectly learn some of the realities of wildlife population dynamics. Writing poems or songs about a favorite animal or tree can accomplish the requirements of a language arts or music class while subtly teaching appreciation and understanding of the resource."

- **Hunting: The Value of a Historical Perspective**

Like the prevalence of the humanistic sentiment, widespread concern about sport hunting among young people in this survey also signifies a very real challenge that needs to be recognized. There are two important factors to consider in meeting this challenge--young people clearly distinguish between hunting for food and hunting for sport, and, whereas opinions about food hunting may become more positive as they mature, their negative attitudes about sport hunting are established before they reach their teens. In an analysis of research on public attitudes toward hunting (Kellert and Westervelt 1983), it was concluded, "The American public is slowly shedding some of its traditional support of hunting activities." The current findings suggest the pace may quicken in the near future.

Balanced and objective information will become more valuable to education programs that address hunting. To avoid endangering the effectiveness of a wildlife education program with controversy over hunting, a learning atmosphere can be created with gathering information on the number of Americans who enjoy hunting, the main reasons they hunt, and how and why these numbers and reasons have changed in American history. Students can then reach their own conclusions based on the objective facts they gathered.

Future studies on children's attitudes toward hunting might consider using non-categorical scaling techniques such as the psychophysical magnitude scales used effectively by Bammel (1982) to measure hunting attitude of adults. The value of these magnitude scales is that the rater creates them, they produce ratios, have inherent validity, and parametric statistics are appropriate. The present authors also strongly recommend that hunting be carefully defined for respondents under the age of 15 to increase the accuracy of the numbers of young hunters and to examine the reasons behind the noted differences in children's opinions about hunting for food and sport.

- **Fuel Naturalistic Interests at Younger Ages**

Although naturalistic appreciation for wildlife was not as common as humanistic sentiments, there were a sizeable number of children in this study who clearly preferred wild animals over pets, derived great enjoyment from being near wildlife outdoors and engaged in activities that required direct involvement with

wildlife. If we assume adults are less wildlife-oriented because of a recent societal trend and not because of a maturational phenomenon, chances are that naturalistic interests will become more common and the demand to satisfy them will intensify. Keeping in mind the characteristics of the children in this survey, that future may look even more likely in light of earlier evidence that wildlife interests increase as children grow older (Kellert 1983). The opposing influence of expanding urbanization, however, will make it important for wildlife programs to reach more and more children. As this growing group of urban children come to rely more heavily on indirect sources of wildlife contact, such as wildlife television shows, books, schools, and zoos, the accuracy and objectivity of the information they receive will become more crucial. Some of the more valuable opportunities that urban areas can provide, in terms of influencing wildlife knowledge and attitudes, are identifying birds, belonging to an animal club, watching wildlife television shows, and bird watching. As Shaw and Mangun (1984) have noted, agencies interested in stimulating opportunities for non-consumptive wildlife activities would do well to put more emphasis on urban-based initiatives.

The inverse relationships found throughout the study between the naturalistic and negativistic attitudes suggest a need to allay children's fears of animals before an interest in wildlife can develop. Three demographic groups--females, urban residents and those living in the South--demonstrated consistently low naturalistic and high negativistic scores, indicating a need for more wildlife education programs targeted at these specific populations.

- **Develop Conceptual Understandings at Younger Ages**

Before drawing gloomy conclusions about the equally low knowledge levels of both young and adult Americans, we must consider the Connecticut study's report of a large gain in knowledge level after the grade levels examined here, that is between the 5th and the 8th grades. Naturalistic interests also increased later on between the 8th and 11th grades. Further study of older children might yield somewhat different results with more positive implications for the future.

Conclusions about the knowledge results should also consider the type of knowledge that was measured, that is, factual knowledge about very specific characteristics of particular animals. There is evidence that conceptual knowledge is more positively related to positive environmental attitudes than factual knowledge (Richmond and Morgan 1977). This would suggest that young people who appreciate the concept of interdependence may have more positive beliefs about wildlife than those who know how animals are classified or that trout eat flies, for example. Without undermining the importance of teaching facts, perhaps greater benefits would be gained from developing basic concepts at ages earlier than most environmental education programs currently begin. This

process could start in the early elementary grades using the humanistic orientations discussed before in this chapter.

Introduced in an appropriate manner and supported with accurate background information, education materials on predator-prey relationships could be integrated into elementary school curricula and serve as the basis for ecological concept development. Despite teachers' uncertainties, young children from kindergarten to the 3rd grade are able to accept the concept of predation (Powell and Powell 1982). The wildlife preference results of the present study indicate that animals such as the eagle, owl, and bear could help to encourage the development of this concept.

- **Increase Opportunities for Direct Contact With Wildlife**

Another key finding of this study was the important role played by wildlife-oriented activities in the development of knowledge. For example, we found that, in general, activities exerted stronger influences over knowledge than attitudes did. Active behaviors that required direct involvement with live animals, such as fishing, hunting and identifying birds, frequently has stronger and more consistent relationships with both attitudes and knowledge than did indirect wildlife-related behaviors such as various school activities and going to the zoo. The obvious implication is that new educational opportunities for direct contact and active involvement with wildlife will have far greater payoffs than continuing to rely on traditional sources of non-interactive contact. However, the value of particular indirect activities such as watching wildlife televisions shows and belonging to animals clubs was also clearly demonstrated and deserves further investigation. Feeding wildlife has been reported elsewhere as a popular activity of children (LaHart 1978; Piaget 1929) and should also be examined in future studies of this kind.

For resource managers, the activity results should be particularly insightful because childhood participation in wildlife activities is a significant determinant of adult participation (Sofranko and Nolan 1972; Yoesting and Burkhead 1973). Certainly, opportunities for fishing, as the most popular wildlife activity of American youth, will be in great demand in the future. The demographic profile of wildlife-oriented recreationists can be expected to shift if fishing remains as popular with urban and suburban youth, young female bird watchers continue to outnumber males, and anti-sport hunting sentiment among rural youth is maintained at its present level. For the immediate future, public lands will feel the impact of young Americans' growing interest in wildlife. From 1983-84, schoolchildren actively pursuing the study of ecology and environmental relationships (U.S. Fish and Wildlife Service 1984). Thus, resource managers can prepare for the approaching change in profile of wildlife enthusiasts--in number, demographic composition and form of recreation sought after.

Chapter 4: Youth Hunter and Angler Demographics

This chapter presents an overview of the demographic characteristics of youth hunters and anglers in the United States, including gender, household type, residence, ethnicity, and role of the family.

Youth Hunter Demographics

Gender

Although both male and female youth (6-15) participate in hunting, hunting is a predominantly male activity, as demonstrated by several National Surveys of Fishing, Hunting, and Wildlife-Associated Recreation. In 1980, 93% of 6-15 year-old hunters were male, and 7% were female; in 1985, 91% of 6-15 year-old hunters were male, and 9% were female; in 1990, 89% of 6-15 year-old hunters were male, and 11% were female; and finally, in 1995, 88% of 6-15 year-old hunters were male, and 12% were female (U.S. Department of the Interior, Fish and Wildlife Service 1980, 1985, 1991, and 1996).

In a recent study conducted by the Sporting Goods Manufacturer's Association on teen participation in sports, 87.5% of youth hunters in 2000 were male, while 12.5% were female (SGMA 2001). This gender split holds true across age groups. Specifically, the same study showed that among hunters ages 6-11, 93% were male and 7% were female, and among hunters ages 12-17, 81% were male and 19% were female (SGMA 2001).

In a study conducted by Responsive Management for A Wisconsin Alliance for Resources and the Environment in 1995 on youth aged 16-17, Wisconsin males (47%) were more likely than were Wisconsin females (6%) to have hunted in the previous 2 years (Responsive Management 1995b). The study also found that male family members were more likely to hunt than were female family members. All respondents were asked if anyone in their family hunts, and almost half (47%) said no, but 42% of the respondents said that their father hunts, 25% said brothers hunt, 7% said uncles hunt, 5% said a grandfather hunts, 3% said their mother hunts, 3% said sisters hunt, 1% said cousins hunt, and 1% said other individuals in the family hunt (Responsive Management 1995b).

Household Type

Some researchers have identified single-parent households and a changing family structure as having an adverse effect on hunting initiation and continuation (Hendee and Potter 1971 in Duda et al. 1998). Brown et. al. (2000) note:

The traditional nuclear family that was common in rural areas, and which facilitated the transmission of values of which hunting has long been a part, has been rapidly eroding... For hunting, male role models in two-parent families, especially fathers, have typically served as the providers of information and experience necessary to stimulate children's interest in hunting. With loss of the

male parent presence in the family through divorce, family interest and participation in hunting are likely to diminish, as is the chance for transmission of hunting values. Furthermore, remarriage poses its own set of problems in relation to hunting. Children of hunting descent with a new nonhunting stepparent may have their hunting interest opposed by the stepparent and/or insufficiently nurtured by the natural parent who hunts.

However, in major trends analyses by Heberlein and Thomson (1991), mother-headed households had no effect on hunting participation for males or females (Heberlein and Thomson in Duda et al. 1998).

Residence

The National Surveys of Fishing, Hunting, and Wildlife-Associated Recreation found that in 1985, 38% of youth hunters (6-15) lived in urban areas, while 62% lived in rural areas; in 1990, 41% of youth hunters (6-15) lived in urban areas, while 59% lived in rural areas; and finally, in 1995, 41% of youth (6-15) hunters were from urban areas, while 59% were from rural areas (U.S. Department of the Interior, Fish and Wildlife Service 1985, 1991, and 1996).

Traditionally hunting has been closely tied to the rural community (Duda et al. 1998). Brown et al. speculated that increased urbanization is the single greatest demographic factor related to decreasing hunting participation. "Because hunting is primarily a non-metropolitan activity passed down from fathers to sons, it is difficult to imagine hunting growing in popularity" (Brown et al. 2000). Noting that hunting traditionally draws participants from rural areas where traditions are passed down from generation to generation and a community value exists for hunting, the movement of rural residents to urban areas as well as the encroachment of urbanization into rural areas are resulting in fewer hunters. Rural residents who move to urban areas, though they themselves may have been introduced to hunting by a parent, do not continue to initiate their children into the sport (Brown et al. 2000). In addition, in today's society there exists an ever-increasing demand on a person's time. Those who hunt find that other activities compete for time and the opportunities that must exist for the hunting tradition to be passed down to the next generation.

Ethnicity

The white/non-white breakdown of youth hunting participants has remained remarkably consistent. The National Surveys of Fishing, Hunting and Wildlife-Associated Recreation found that in 1980, 97% of youth (6-15) hunters were white; in 1985, 95% of youth (6-15) hunters were white; in 1990, 97% of youth (6-15) hunters were white; and in 1996, 96% of youth (6-15) hunters were white (U.S. Department of the Interior, Fish and Wildlife Service 1980, 1985, 1991, and 1996).

Youth Angler Demographics

Overall

Fishing is a widespread activity that crosses all demographic characteristics. Nearly all Americans will fish or have fished at some time in their lives, and that experience is typically within the context of a family activity (Duda et al. 1998). In general, however, the majority of fishing is done by white males.

Gender

Although fishing is widespread across the population, more than two-thirds of freshwater anglers of all ages are male (Duda et al. 1998). Indeed, the National Surveys of Fishing, Hunting, and Wildlife-Associated Recreation found the following breakdown of youth anglers (6-15): in 1980, 67% were male and 33% were female; in 1985, 67% were male and 33% were female; in 1991, 63% were male and 37% were female; and in 1995, 63% were male and 37% were female (U.S. Department of the Interior, Fish and Wildlife Service 1980, 1985, 1991, and 1996).

Along with the gender differences in participation in fishing, there are important gender differences regarding attitudes towards and satisfaction with fishing (Duda et al. 1998, Responsive Management 2001a; 2001b). These differences start during childhood and continue through adulthood. In a study of youth fishing participation in South Carolina, Responsive Management (2001a) found that significantly more male youth than female youth had gone fishing in their life, had fished within the previous 12 months, had fished more recently, and had fished more days per year. The majority of male youth in South Carolina (55%) liked fishing “a lot,” whereas the majority of female youth (54%) liked fishing only “a little” (Responsive Management 2001a).

Fishing is a ubiquitous activity for most Americans. As stated above, most U.S. adult residents have fished at some point in their life. However, although they have fished, women typically fish less often as children and, therefore, do not continue to participate at the same rate as do men later in life (Responsive Management 1999a). Boys are significantly more likely than girls to have fished before the age of 16, and many women may not be fully initiated into fishing until they are adults (Responsive Management 1999a). This is a critical issue because of the relationship between fishing participation as a child and fishing participation and fishing loyalty as an adult (Responsive Management 1999a). The lower fishing rate among females suggests that a) their degree of specialization will be lower, b) as adults, they will fish less often than males, and c) their drop-out rate will be higher than males’ drop-out rate (Responsive Management 1999a).

There are important implications for fishing participation based on different initiations of male and female children. The most salient question is “Why do young girls fish at significantly lower rates than their male counterparts?” Responsive Management observed in a series of focus groups for the study “Future of Fishing” that traditional white, rural families often feel that fishing is for young boys and is not a “prim and proper” activity for young girls (Responsive Management 1998). Some parents in these groups wanted their young girls to be more “glamorous” and to attain a beauty queen image, and they indicated that fishing does not

contribute to this image (Responsive Management 1998). This belief was expressed several times in these focus groups, especially among rural residents. Finally, there is evidence of a social bias against young girl's fishing. For example, while the Boy Scouts of America has a fishing badge, the Girl Scouts of America does not (Responsive Management 1999a).

Role of the Family

Much research indicates that fishing is a recreational activity centered on and about the American family. Most anglers are initiated within the context of the family; a large percentage of Americans who have fished once did so with another family member; and most anglers prefer to fish with a family member or friend (Duda et al. 1998). This social aspect of fishing is probably more important than catching large numbers of fish or trophy-size fish and may be as important as the naturalistic values of fishing. In all likelihood, fishing is best understood as a combination of relaxation, social, and naturalistic values. The social and naturalistic values appear to be quite consistent across other demographic factors and seem to be the only values that can be taken as generalizations. The social aspects of fishing, especially the bonding of children with parents or grandparents (as well as bonding with close friends), are extremely important factors in satisfaction with fishing (Responsive Management 1999a, Duda et al. 1998).

Household Type

Although some research has speculated that an increasing divorce rate and children growing up with single mothers have contributed to a decline in youth fishing (Brown 1987), research indicates that there are no statistically significant differences between fishing participation among children who grew up in a single-parent household and fishing participation among those who grew up in a dual-parent household. Americans who were raised in a single-parent household are just as likely to be active anglers as those raised in dual-parent households (Responsive Management 1995; Dann 1993; Duda et al. 1998).

Fishing Participation and the Single-Parent Household

- **Study:** Telephone survey of 2,085 American adults conducted by Responsive Management in 1995. *Factors Related to Hunting and Fishing Participation: Phase IV Quantitative Analysis*. Report to the U.S. Department of Interior, Fish and Wildlife Service, Division of Federal Aid, Grant Agreement 14-48-0009-92-1252. 88pp.
- **Finding:** No significant difference between participation in fishing in previous 2 years among those who grew up in a single-parent household and those who grew up in a dual-parent household ($p=0.30820$).
- **Study:** Mail survey of 1,391 Michigan fishing license holders conducted by Dann (1993). "Youth recruitment into fishing: the influence of familial, social, and environmental factors and implications for education intervention strategies to develop aquatic stewardship." Ph.D. dissertation submitted to Michigan State University. 363pp.
- **Finding:** No significant difference between participation in fishing among those who grew up in a single-parent household and those who grew up in a dual-parent household.

According to Duda et al. 1998:

The single-parent household issue is interesting because it makes certain assumptions. The first assumption is that women do not take their children fishing. But research shows otherwise. Females do take their children fishing. Furthermore, more women are fishing these days, not [fewer]. While fishing participation among the U.S. male population remained stable over the last decade, participation in fishing among the female population has increased. The second assumption is that the increase in single-parent households is occurring at equal rates across demographic groups. However, the U.S. Bureau of the Census data show that children growing up in the city are more likely to grow up in a single-parent household than those growing up in suburban or rural areas. For example, in the inner city in 1995, 39% of all households with children were single-parent households. But in the more rural areas, 23% of all households with children were single-parent households. Couple this with the fact that rural residents are more likely to fish than people from large cities, and it is clear that the increase in single-parent households is occurring among a segment of the population that is less likely to fish anyway. The third assumption is that children in single-parent, female-headed households never see their father or otherwise completely lack a social support system which provides them the opportunity to fish. Of course, there are those children that are unfortunate in that they never get to see their father. But in many cases, although Dad may not live in the same house, he certainly is not entirely out of the picture. In many divorced households, Dad picks up the kids on Saturday morning and goes off to the soccer field or to the lake to fish. And finally, in other female-headed households, grandfathers, uncles and neighbors often step into the role of taking the kids fishing. Although it is true that certain broad demographic changes impact

fishing participation, research up to this point has not shown that single-parent households is one of them.

Residence

Fishing participation varied with the type of residential area. The National Surveys of Fishing, Hunting, and Wildlife-Associated Recreation found the following urban/rural breakdown among youth (6-15) anglers: in 1985, 57% of youth anglers were urban and 43% were rural; in 1990, 61% were urban and 39% were rural; and in 1995, 61% were urban and 39% were rural (U.S. Department of the Interior, Fish and Wildlife Service 1985, 1991, and 1996).

Ethnicity

The National Surveys of Fishing, Hunting and Wildlife-Associated Recreation found that in 1980, 93% of youth (6-15) anglers were white; in 1985, 92% of youth (6-15) anglers were white; in 1990, 92% of youth (6-15) anglers were white; and in 1996, 91% of youth (6-15) anglers were white (U.S. Department of the Interior, Fish and Wildlife Service 1980, 1985, 1991, and 1996).

Chapter 5: Youth Opinions on and Interest in Hunting and Fishing

Youth Opinions on Hunting

Kellert and Westervelt (1983) studied children's attitudes toward animals in 22 primary and secondary schools in Connecticut and found varying degrees of support among youth regarding hunting for food, for fun, and for trophies. In general, children approved of hunting for food (60% overall approved), but a majority disapproved of "hunting for fun" (84% overall disapproved) as well as "hunting big wild animals in Africa and putting their horns on the wall" (83% overall disapproved). Specifically, 9% strongly approved; 51% approved, but not strongly; 18% disapproved, but not strongly; and 13% strongly disapproved of hunting animals for food. Additionally, 5% strongly approved; 6% approved, but not strongly; 37% disapproved, but not strongly; and 47% strongly disapproved of "hunting animals for fun," while 4% strongly approved; 5% approved, but not strongly; 36% disapproved, but not strongly; and 47% strongly disapproved of "hunting big wild animals in Africa and putting their horns on the wall."

Kellert and Westervelt (1983) found major differences in opinions on hunting among 2nd, 5th, 8th, and 11th graders. In general, 2nd graders were more likely than those children in higher grades to approve of hunting (Kellert and Westervelt 1983). The researchers also detected differences between males and females. Males were more likely to approve of hunting for food than were females. For example, 71% of males approved of hunting for food compared to 49% of females (Kellert and Westervelt 1983).

Westervelt and Llewellyn (1985) studied 5th and 6th graders' opinions on hunting as part of a nationwide study on youth and wildlife. The study found that 46% agreed (11% strongly agreed and 35% agreed) and 42% disagreed (23% strongly disagreed and 19% disagreed) that hunting wild animals for food is okay. In addition, 79% disagreed (58% strongly disagreed and 21% disagreed) and 15% agreed (5% strongly agreed and 10% agreed) that hunting wild animals for sport is okay. The authors noted, "While it was instructive to learn that most of the young respondents were opposed to sport hunting, perhaps most relevant was the fact that they differentiated between hunting for food and hunting for sport" (Westervelt and Llewellyn 1985:15). The greatest opposition to hunting in Westervelt and Llewellyn's study came from females, urban residents, and children living in the Pacific Coast states. When making comparisons between children's attitudes toward hunting in this study and the national study conducted by Kellert and Westervelt (1983) using similar questions, the researchers noted that anti-hunting sentiment was less evident in adults. Based on these and other studies, the authors shed light on the evolution of attitudes toward hunting:

Regarding attitudes toward sport hunting, the stage of transition appears to be during the three years prior to the 5th grade (ages 8-10), when opinions become negative and remain so into young adulthood. Later, in the three years following the 5th grade (11-13), attitudes about hunting for food become more positive, and they remained that way through adulthood (Westervelt and Llewellyn 1985:29).

A survey conducted by the Missouri Department of Conservation on knowledge possessed by Missouri 5th graders about deer found that 58% disagreed that deer hunting was "okay" (42% agreed) (Glover et al. 1987).

A study conducted by Responsive Management (1995b) on Wisconsin youths' (16-17 years old) attitudes toward hunting found similar results to Kellert and Westervelt's (1983) and Westervelt and Llewellyn's (1985). In the Wisconsin study, 76% of Wisconsin resident youth approved of legal hunting, while 18% did not approve of legal hunting (Responsive Management 1995b). More youth (84%) agreed that hunting should continue to be a legal activity than the percentage of youth who actually approved of legal hunting (76%). An overwhelming majority (90%) of Wisconsin youth agreed that people should have the freedom to choose to hunt if they want to (Responsive Management 1995b).

In that study, most Wisconsin youth (16-17 years old) approved of hunting to help manage animal populations (89%) and for meat (87%) (Responsive Management 1995b). A majority (67%) of Wisconsin youth approved of hunting for recreation, but less than a majority (27%) of Wisconsin youth approved of hunting for a trophy. Of those Wisconsin youth who did not strongly approve of legal hunting, 93% would be more likely to approve of hunting if they knew that it was important for some families as a source of food, and 82% would be more likely to approve of hunting if they knew that in the U.S. modern hunting has not caused any animal populations to become endangered species (Responsive Management 1995b). Smaller percentages, but still a majority of Wisconsin youth, would be more likely to approve of hunting if they knew that hunters help pay for wildlife conservation (78%), if they knew the Wisconsin Department of Natural Resources supports legal hunting (69%), and if they knew that hunting is safer than rollerblading (64%) (Responsive Management 1995b).

This study also found that 60% of Wisconsin youth agreed and 39% disagreed that hunting is generally a safe recreational activity (Responsive Management 1995b). In addition, Wisconsin male youth (88%) were more likely than females of the same age (65%) to approve of hunting (Responsive Management, 1995b).

Youth Interest in Hunting

In a nationwide study conducted by Responsive Management (1997) for the U.S. Fish and Wildlife Service, youth 13-20 years old were surveyed about their interest in hunting. The study found that 15% were very interested in hunting, 16% were somewhat interested in hunting, and 18% were a little interested in hunting; however, 52% stated that they had no interest in hunting (Responsive Management 1997). The 52% of all respondents who expressed no interest in hunting were asked the reasons for their lack of interest in hunting. Over half (52%) of the respondents with no interest in hunting said they love animals or don't like killing animals, 16% had no reason, 13% said that animals have a right to live, 8% said they have never been exposed to hunting, 16% gave other reasons, 4% said it is boring or not fun, 3% said they don't like guns, and less than 3% said that they are too busy with other activities, don't like it, have no one with which to hunt, live in the city or have no place to hunt, are vegetarians, have parents that won't allow them to hunt, and/or that their friends are against hunting (Responsive Management 1997).

The same study showed that 19% of the youth who did not hunt said peers would motivate them to hunt, followed by themselves (12%), father (6%), other family member (5%), or a hunter education course (5%) (Responsive Management 1997).

Youth who showed an interest in hunting came from homes where family members hunted. Most youth who showed an interest in hunting had a father who hunted (53%), a brother who hunted (25%), an uncle who hunted (17%), and/or a grandfather who hunted (12%).

One study conducted by the Ohio Division of Wildlife in 1993 on youth (12-17 years old) and hunting offers some information on young people's interest in and attitudes toward hunting (Miller 1993):

- 15% reported that they had hunted.
- The main reason that youth did not hunt more was no time (57%), followed by lack of someone to take them (14%).
- 34% of those who had never hunted responded that they would like to try hunting.
- 43% of those who had ever hunted and those wanting to try hunting had heard of the hunter education course; 52% said that they had never heard of the course, and the remainder had taken the course.
- 97% answered true and 3% answered false to the question, "I think that learning how to handle guns safely is very important, and I want to learn this before I go hunting."
- 27% said they might like to try hunting but didn't know anyone who hunts and can show them how; 73% answered false to this question.
- 53% answered true and 47% answered false to the question, "I would like to try hunting but I don't know how to get started or how to find out about the hunter education courses."

Responsive Management (1995b) found that 50% of 16-17 year old Wisconsin youth said that they would not be interested in hunting in the next 5 years, 47% said they would be interested, and 3% said they did not know. Males (74%) were more likely than females (21%) to say that they would be interested in hunting (Responsive Management 1995b).

In the Wisconsin study, respondents with an interest in hunting in the next 5 years were asked from whom they would feel most comfortable learning about hunting. The most frequent response was a parent (38%). Following parents were people who know about hunting (19%), teachers (11%), other family members (7%), friends of their family or neighbors (7%), other individuals (7%), and an organizational person like a scout leader (6%) (Responsive Management 1995b).

Youth Opinions on Fishing

Overall, youth view fishing as a much less controversial activity than hunting. Unlike hunting, where participation is often limited by ethical concerns for animals, fishing participation is more commonly limited or prevented by constraints such as lack of time or lack of a companion with whom to go fishing. Unlike hunting, no research has shown that there are any remarkable negative issues associated with fishing (summarized in Duda et al. 1998).

There are differences in attitudes toward fishing among age groups. In a study conducted on South Carolina youth, Responsive Management (2001a) found that positive opinions toward

fishing decreased as age increased. Youth in grades 1-4 were the most enthusiastic about fishing, with 55% reporting that they liked fishing “a lot,” compared to 48% in grades 5-8 and 41% in grades 9-12 who liked fishing “a lot.”

How “cool” fishing is perceived also changes as grade level increases, as the South Carolina study indicates. Fishing was viewed as being “cool” most often by youth in grades 1-4 (Responsive Management 2001a). Although majorities of youth of all grade cohorts thought fishing is either “a little cool” or “very cool,” the youngest youth, those in grades 1-4, reported fishing as being “cool” more than did any other grade cohort (Responsive Management 2001a). However, youth’s idea of fishing as a positive activity changes little after grade 4. Identical overall combined percentages of respondents in grades 5-8 and grades 9-12 reported fishing as “cool” (combined “a little cool” and “very cool”—79%) or “not cool at all” (16%) (Responsive Management 2001a). A significantly greater proportion of youth indicated that fishing was “very cool” in the lower grade levels (26% in grades 1-4, 18% in grades 5-8, and 19% in grades 9-12), and “not cool at all” in the upper grade levels (16% in grades 9-12, 16% in grades 5-8, and 8% in grades 1-4) (Responsive Management 2001a).

Youth Interest in Fishing

When questioned about their interest in fishing, 53% of youth in South Carolina 8-18 years old said that they would go fishing more often if they could (Responsive Management 1999). Although fishing is more popular among males, with 55% of male youth reporting liking fishing “a lot” compared to 54% of female youth liking fishing “a little,” large percentages of both male (57%) and female (47%) anglers in South Carolina wished that they could fish more often (Responsive Management 2001a).

Although interest in fishing by males and females was shown to be high, males were generally more enthusiastic about fishing in the South Carolina study (Responsive Management 2001a). When male and female youth were presented with different types of fishing and asked if they were interested in participating in each type of fishing, female youth, in general, showed less interest than male youth in all of the different types of fishing presented to them (Responsive Management 2001a).

The South Carolina study found that the most popular reason that youth of either gender go fishing was “to have fun,” reported by 45% of both male and female anglers (Responsive Management 2001a). Males and females gave a variety of reasons why they don’t fish more often. The most common reason reported for both male (41%) and female (35%) youth for not fishing more often was “not enough time” (Responsive Management 2001a). When asked specifically what caused respondents to not have enough time, “school” was the only reason given by a majority of male (65%) and female (74%) youth.

Respondents were read a list of different types of fishing and asked if they were interested in participating in any of them. The most popular type of fishing in which youth were interested was fishing from a boat (85%). Other types of fishing that had high percentages expressing interest were fishing from the bank of a lake or river (80%), fishing from a spot in the respondent’s area made for fishing (70%), bait fishing (67%), deep-sea fishing (59%), and fishing from the beach (53%). The only type of fishing for which a majority did not report an interest was fly fishing (32%) (Responsive Management 2001a).

Chapter 6: Youth Satisfaction with Hunting and Fishing

Youth Satisfaction with Hunting

Relatively little information is available regarding youth satisfaction with hunting. Langenau and Mellon (1980) found that Michigan hunters 12-18 years old reported that seeing game, getting out of doors, and the challenge and suspense of seeking game were the major components of hunting satisfaction. Although killing of game was ranked lower than these hunting satisfaction parameters, it was positively correlated with hunting satisfaction (Duda et al. 1998).

More information exists on youth attitudes toward hunter education programs. In a study conducted by Responsive Management (1997), "The Effects of Mandatory Basic Hunter Education and Advanced Hunter Training on Hunter Recruitment and Retention," youth 13-20 years old were asked questions regarding their opinions on hunting and hunter education programs. A majority of respondents (88%) felt that they would learn valuable things in a hunter education course, while only 11% felt a hunter education course would be a waste of time. Respondents were asked in what areas they want or need more information about hunting, and they could give more than one answer to this question. While (23%) did not know, 14% said they didn't need any information (not interested), 8% said handling of game, 8% said "other," 8% said other laws and regulations, 8% said handling of equipment, 7% said safety, 6% said hunting techniques, 5% said where to go, 5% said tracking game, 4% said shooting proficiency, 4% said season dates, 3% said bag limits, and less than 3% said bow hunting, deer hunting, and/or waterfowl hunting (Responsive Management 1997).

Most of the youth interested in hunting in the Responsive Management (1997) study felt they would sign up for a course less than 2 months in advance and most would be willing to drive 30 minutes or less one-way to take a hunter education course. Of the youth who were interested in hunting, 56% had never seen a hunter education course advertised. Although 31% would call their state fish and wildlife agency to find out about a hunter education course, 22% did not know whom to call, while the remainder said they would call various different organizations (Responsive Management 1997).

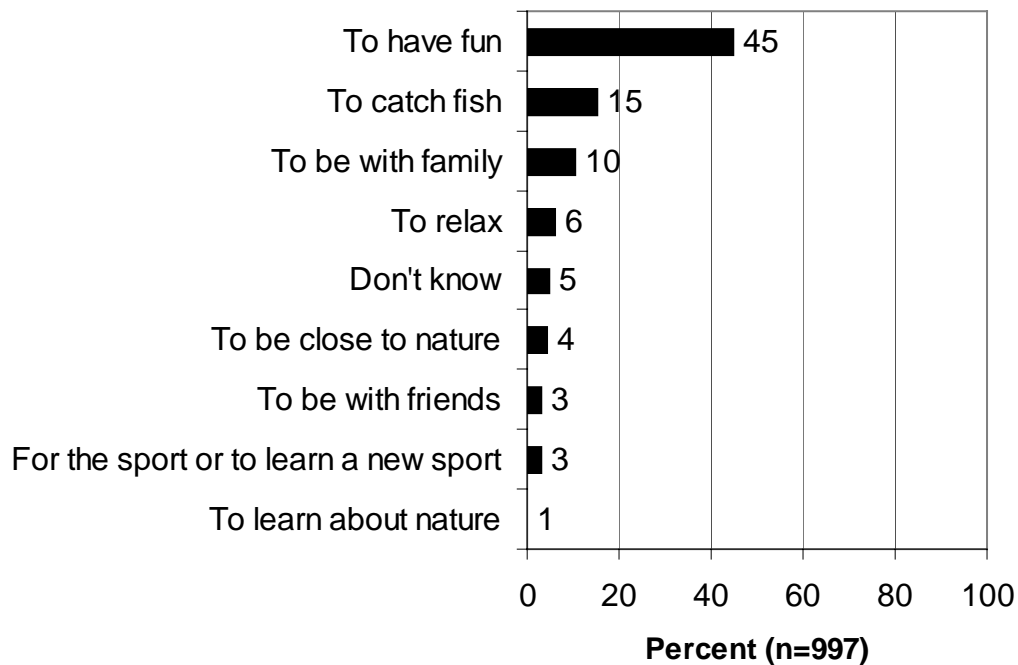
In the Responsive Management (1997) study, the youth were also questioned about their attitudes toward advanced hunter training. Mandatory courses did not appear to be an even minor reason why non-bowhunters and non-muzzleloaders did not participate in bowhunting or muzzleloading, respectively. The study found that a voluntary bowhunting education course would be most likely to motivate younger hunters to take up bowhunting. Overall, a majority of active hunters felt that they would learn valuable things in an advanced hunter training course (65%), although 30% thought it would be a waste of time. A majority of active hunters felt it was very important for an advanced hunter education course to have a hands-on or field component in addition to classroom learning. Respondents most commonly (41%) said that they would be willing to travel 15-30 minutes to take an advanced hunter education course. However, 45% of active hunters said that they had never seen a basic or advanced hunter education course advertised. A majority of active hunters (65%) stated that they would call their state fish and wildlife agency to find out about, or where to take, a hunter education course (Responsive Management 1997).

Youth Satisfaction with Fishing

In a study on youth fishing in South Carolina, Responsive Management (2001a) found that youth go fishing for a variety of reasons. The most popular reason for going fishing regardless of grade cohort was “to have fun,” as shown in the graph below. The study found significantly different distributions of reasons why males and females choose to go fishing. For male youth, fishing “to catch fish” (19% for males relative to 11% for females) and “to relax” (8% for males relative to 4% for females) were more important reasons to go fishing than they were for female youth to go fishing (Responsive Management 2001a). For female youth anglers, “to be with family,” was a more important reason to fish than it was for male youth anglers (15% for females relative to 6% for males).

In the South Carolina study, satisfaction with fishing varied by age/grade cohort just as children’s cognitive abilities change with age group. Younger youth, in grades 1-4, associated satisfaction with egocentric, hands-on activities such as catching fish or having fishing equipment. A greater proportion of youth in grades 1-4 (23% relative to 16% in grades 5-8 and 10% in grades 9-12) indicated that they fished “to catch fish” (Responsive Management 2001a). As age increased, “to catch fish” became a decreasingly important reason for fishing. In general, those reasons to fish that had a more naturalistic connotation of “being close to nature” and “to relax” were especially important to higher grade-level youth (Responsive Management 2001a).

**Main Reasons for Fishing
(all respondents)**



In a study on Georgia Kids' Fishing Event participants, Responsive Management (2001b) presented respondents with nine possible fishing motivations. The youth were asked if the fishing motivation was a very important reason, somewhat important reason, or not a reason at all why they fish. The main motivations for fishing among Kids' Fishing Event participants were all social/psychological in nature. To have fun (92%), to be with family (77%), to learn about nature (75%), for relaxation (61%), for the sport or to learn a sport (59%), and to be with friends (58%) were all reported to be very important fishing motivations by a majority of the youth surveyed (Responsive Management 2001b). In addition to asking the youth why they fished, youth who reported liking the Kid's Fishing Event were asked what they liked best about the event. The two most liked aspects of the event were catching a fish (41%) and the act of fishing (33%) (Responsive Management 2001b).

The study showed that a disproportionately higher percent of males indicated that they found it very important to catch a lot of fish, to learn a new sport, to catch a big fish, and to relax (Responsive Management 2001b). The study also found several significant relationships between grade level and the items that children found most important in the sport of fishing. As grade level increased, children became less interested in being with family, in catching a lot of fish, in learning about nature; they were more interested in relaxing, significantly more interested in having fun, and significantly more interested in being with friends (Responsive Management 2001b). Having fun and improving skills have been shown to be the most important motives of children in sports between the ages of 11 and 18 (Sapp & Haubenstricker 1978 in Responsive Management 2001b).

Dissatisfaction with fishing mostly had to do with comfort or safety issues (Responsive Management 1999; 2001a). Dissatisfaction and lack of participation in fishing for youth in grades 9-12 revolved mostly around the idea that fishing was no longer as important as other activities in teenagers' lives. Youth in grades 9-12 were especially reluctant to identify fishing as a primary activity in which they were interested (Responsive Management 1999). The attitude regarding competing activities for teenagers' time and the lack of importance of fishing for youth in grades 9-12 is exemplified in this quotation from an 11th grader recorded in a Responsive Management focus group:

"I've fished before, my daddy fishes, but I'm usually busy as a cheerleader after school. I went with my boyfriend last weekend. I just tagged along....I used to go a lot when I was little. I'd go with my grandmother. I haven't been in about 7 years. I used to go camping too. I don't have time for anything now. My brother goes everyday, he isn't involved with anything else....I don't fish a lot anymore. I've been camping about twice in my life. We had to catch fish and clean them, but I haven't done it since....I go with my daddy, but only once in a while. I just do it when I'm bored. I just don't think about it anymore....My boyfriend drags me along once in awhile, but I don't like it.....I don't like fish. My grandmother fishes, but I'm scared of worms."

Chapter 7: Youth Hunting and Fishing Desertion Factors

Desertion Factors for Hunting

Human dimensions studies have shown that attrition from hunting participation (i.e., participation in the field, not from the social world of hunting) is associated with aging (Decker, et. al 2001). Although the general population has aged with greater vitality and longevity over the past quarter-century, with some hunters remaining active longer, attrition from hunting is still marked in the older age cohorts (Decker et. al 2001).

The factors most related to hunting desertion among adults are generally social or psychological (Decker et. al 2001). Although availability of wildlife and habitat, health, cost, and logistics account for some of the decrease in hunting, those reasons are seldom associated with a high potential for hunting desertion (Enck et al. 1993 and Responsive Management 1995 in Decker et. al 2001). The factors that seem to underlie desertion are a lack of family support or other social support and lack of significant hunting apprenticeship experiences, which in itself reflects lack of social support for participation (Purdy, et al. 1989 in Decker et. al 2001).

In a study conducted on youth 16-17 years old in Wisconsin, Responsive Management found that 5% of non-hunters do not hunt and 8% of hunters do not hunt more because their parents won't let them hunt and are against hunting. Additionally, 15% of non-hunters did not hunt and 20% of hunters did not hunt more because they did not have anyone to go with. Eight percent of non-hunters did not hunt and 14% of hunters did not hunt more because hunting costs too much. Six percent of non-hunters did not hunt and 23% of hunters did not hunt more because they did not have any places to hunt. Forty-four percent of non-hunters did not hunt and 17% of hunters did not hunt more because they had not taken a required hunter education or hunter safety course. Thirty-nine percent of non-hunters did not hunt and 9% of hunters did not hunt more because they did not like guns. Twenty-one percent of non-hunters did not hunt and 3% of hunters did not hunt more because they were not interested in hunting. Five percent of non-hunters did not hunt and 32% of hunters did not hunt more because other interests took up too much time. Twenty-two percent of non-hunters did not hunt and 5% of hunters did not hunt more because they did not want to or did not like to kill animals. Eleven percent of non-hunters did not hunt and 10% of hunters did not hunt more because of other reasons (Responsive Management 1995b).

This study also found that 36% of non-hunters did not hunt because they did not know how to hunt. Fourteen percent of non-hunters did not hunt because none of their friends hunted. Six percent of non-hunters did not hunt because they thought hunting is wrong. Eleven percent of hunters did not hunt more because there were not enough animals to hunt. Three percent of hunters did not hunt more because they did not have time (Responsive Management 1995b).

Desertion Factors for Fishing

Marketing researchers have investigated facets of on-site behavior in comparing anglers and ex-anglers (Dann 1993). Lack of fishing success and contact with fish (handling fish, baiting the hook, cleaning the fish) were the least liked facets of fishing reported by "quitters" or ex-anglers (The NPD Group 1985, Harrington Market Research and AFTMA 1990 in Dann 1993).

A study conducted by Responsive Management (2001a) on youth 8-18 years old in South Carolina found that the most common reason reported for both male (41%) and female (35%) youth for not fishing more was “not enough time.” There is a marked drop off in fishing participation by the time youth reach high school. This may be attributable in part to the time-consuming nature of school and other activities. For example, when asked specifically what caused respondents to not have enough time, “school” was the only reason given by a majority of male (65%) and female (74%) youth (Responsive Management 2001a). Other restrictions on youth’s time included other sports or hobbies (33%), work obligations (19%), and family obligations (9%) (Responsive Management 2001a).

Gender may have a very important influence on socialization, participation in fishing, and enjoyment of fishing (Dann 1993). Using regression analysis, Dargitz (1988) found that gender was a significant predictor of children’s fishing frequency and enjoyment (Dann 1993). This is probably due to differences in gender role socialization, in which girls are less likely than boys to have the same freedom to go fishing wherever and whenever they desire (Dargitz 1988 in Dann 1993). Child development researchers report that early adolescence (ages 10 to 13) is one of the most sexist periods in the life span (Steinberg and Levine 1990 in Dann 1993). Adolescence is a time of increased insecurity about identity; thus a girl may be unlikely to participate or admit enjoying an activity (such as fishing) that is inconsistent with existing gender role stereotypes (Dann 1993). A youth’s gender affects consumer socialization by peers; females are more likely than males to discuss consumption with peers and to model themselves after peer consumer behaviors (Moschis 1987 in Dann 1993). In short, research suggests that female youths are more susceptible than males to peer influence (Moschis 1987 in Dann 1993). Recreation trends research indicates that women are less than half as likely as men to go fishing, and that this statistic is not likely to change in the future (Kelly 1987 in Dann 1993).

Chapter 8: Initiation, Retention, and Recruitment of Youth into Hunting and Fishing

Hunting

Initiation

Research indicates that initiation into hunting usually needs to occur before the age of 20, and preferably through the father, to instill a long-term love of the sport (Applegate 1977). Many studies have found that most hunters were initiated into the sport before the age of 20. For example, Peterle (1961) found that 90% of Ohioans who hunted began before their 18th birthday, and that two-thirds were initiated into the sport by their father or brother. Bevins et al. (1968) found in six northeastern states that if an individual had not learned to hunt by the age of 21, there was a low likelihood of hunting participation. Sofranko and Nolan (1972) also identified the importance of childhood initiation as a factor in later hunting participation rates. Klessig and Hale (1972) found that 92% of Wisconsin hunters began hunting before the age of 20. In Arizona, 65% of hunters hunted before the age of 20 (Davis 1967). Smith and Roberts (1976) found that 70% of waterfowl hunters had participated in waterfowl hunting prior to 18 years of age.

Youth most likely to hunt and youth with the most interest in hunting generally come from families with strong, close ties to hunting. In a national study conducted by Responsive Management for the U.S. Fish and Wildlife Service, 73% of youth who came from a family that hunted also hunted (Responsive Management 1997). Only 27% of youth who did not come from a family that hunted also hunted. The strongest indicator of the likelihood that a youth would hunt is having a father or brother who hunts. In a national study, 82% of youth who hunted had a father who hunted, and 80% of youth who hunted had a brother who hunted (Responsive Management 1997). In addition, most youth (60%) said that they learned how to hunt from their father, and substantial percentages said that they learned how to hunt from family members (26%) and peers (13%) (Responsive Management 1997).

In a study of 12-18 year old hunters in Michigan, Langenau and Mellon (1980) found that most young hunters were introduced to hunting through family tradition: 84% said that before they were old enough to have a license, they went along with someone else who was hunting, and 92% of the young hunters in the study hunted with family or relatives. In a study of hunter education program graduates in 40 states, Jackson (1992) found that 69% were introduced by their father or stepfather, and less than 1% by their mother, 3% by siblings, 4% by grandparents, 6% by other adults, 3% by themselves, 8% by friends, 2% by a spouse (or boyfriend or girlfriend), and 3% by another relative. When asked about the importance of a number of individuals on their development as a hunter, on a scale from 1 (low) to 5 (high), father ranked highest with an average rating of 3.77, followed by self (3.45), friends in own age group (3.14), other adults (3.03), hunter education courses (2.97), grandparents (2.35), siblings (2.18), media (2.07), mother (1.79), and spouse or boyfriend or girlfriend (1.5).

Applegate (1977) found that a high percentage of individuals who begin hunting with older companions remain active hunters. Applegate noted that initiation is based on the amount of exposure to hunting combined with how important hunting is to the individual's culture and social environment. There appears to be a strong relationship between early initiation into

hunting and the extent and longevity and commitment of individual's participation, according to Applegate (1977) and Applegate et al. (1984). In short, older initiates tend to drop out of hunting sooner than younger initiates.

Applegate found that an increasing proportion of hunters had taken up hunting later in life from 1951 to 1982. Of those individuals who began hunting from 1951 to 1961, 18% were 20 years old or older when they began hunting. Of those who began hunting from 1962 to 1972, 29% were 20 years old or older when they began hunting. Applegate (1982) speculated that the change was due to urbanization: he found that hunters from urban areas tended to begin hunting later in life.

Among Ohio hunters, the principle income earner's participation as a youth in traditional recreational activities was the best predictor of participation in hunting, followed by access to recreation areas (McClaskie et al. 1986). Schole et al. (1973) asked Colorado hunters what initiated their interest in hunting: 29% said a love of the outdoors, 22% said the influence of others, 22% said close proximity of areas for hunting, and 15% said an interest in guns.

Decker and Mattfield (1988) noted that commitment to hunting develops over a period of time, and that some individuals are still "trying out" hunting over a period of several years. Based on the work of Rogers and Shoemaker (1971), Cornell University researchers developed a model of the stages in the development of an individual's interest and involvement in hunting. The process begins with the awareness stage to interest to trial to continuation of hunting. From the interest to the continuation stage, inactivity and ultimately desertion can take place.

O'Leary et al. (1987), examining the 1983 Nationwide Recreation Survey to determine the relationship between the age of a first hunting experience and adult level of participation, found that over 83% of those who hunt began their involvement by 18 years of age, 69% by the time they were 15 years old, and 54% by the time they were 12 years old. O'Leary et al. (1987) also reported a significant association between days hunting and the age of the initial experience: overall, the younger the person was when he or she began the activity, the more participation was reported in a given year. The author's note, "It would appear from the Nationwide Recreation Survey data that persons who are not already hunting by the time they are 18 years of age are unlikely to pursue this sport during their adult life..." (O'Leary et al. 1987:230-231). The authors concluded:

The importance of age at first exposure to an activity may lie in being able to assign an individual to a developmental category of outdoor recreation socialization. Whatever primary social group has the greatest impact on an individual's activity choices at a particular time of life becomes an independent variable that influences participation (Field and O'Leary 1972). For example, an early age of introduction to certain outdoor activities suggests the likely presence of a family group accompanying the young child in the outdoors.

Hunting, however, is not a conventional family activity in which children accompany both parents, but rather...primarily a peer group activity participated in by males (Field and O'Leary 1972:5). Introduction to hunting also involves introduction to firearms. Due to the nature of the equipment used and the makeup of the social group typically engaged, we may speculate briefly about the hunting party that includes a young beginner. A child is not usually brought on a hunt to fill idle hours, but rather when a parent, close relative, or other responsible adult

is willing to act in the role of teacher and, not incidentally, transmitter of the hunting culture. It is perhaps not only this intimate interaction with an older hunting companion that causes hunting to persist into adult life, but also the unique implied rite of passage. As compared to those individuals recruited as teenagers or young adults by friends their own age, those individuals recruited within a 'window of initiation' (i.e., a range of impressionable early ages) by a parent or older relative appear to have a head start toward achieving higher levels of adult participation (O'Leary et al. 1987:231).

Decker et al. (1984:41-43) also identified the importance of the childhood initiation, or apprenticeship stage, and noted:

...what is important to the development of a youngster's interest in hunting is that the youngster be taken afield, not necessarily that s/he carry a firearm.... Perhaps in hunting, vicarious learning takes on another dimension: it may be necessary to ease the initiation into hunting of a youngster sensitive to the death of an animal.... By allowing a child to observe a parent enjoy all the elements of the hunt—the companionship, the autumn colors, the skill, the chase, the meal (and all the psychological rewards therein)—and to participate in most, the killing of game does not take place in a vacuum; a role model shows the way. The conflicts which the youngster may have concerning hunting are slowly resolved as he/she assimilated the attitudes, beliefs, and values of the hunting guardian without being psychologically burdened with responsibility for the kill.

Recruitment and Retention of Hunters

In an overview of extensive work conducted at Cornell University on factors affecting the recruitment and retention of hunters, Decker et al. (1992) noted that two key factors are the opportunity for apprenticeship experiences and the existence of strong social support, especially from family members. Decker et al. (1992:3-4) noted:

Most people are initiated to hunting through two primary mechanisms—family and friends (Brown et al. 1981, Applegate and Otto 1982, Decker et al. 1984, Purdy and Decker 1986). Few hunters begin on their own, i.e., without one or both of these social initiators. Those who are introduced to hunting by family usually begin as children and tend to remain active because they have strong and consistent familial support, usually including hunting apprenticeship experiences of several types except personally killing game. These persons can be thought of as traditional hunters for whom participation is a significant element of their cultural heritage (Decker et al. 1984, Decker and Mattfield 1988). Often these people have a rural background and have peer as well as familial reinforcement for hunting; as adults they are most likely to influence youngsters to adopt the activity and carry on the tradition (Purdy et al. 1989). Those who are introduced to hunting by friends usually try out or 'experiment' with hunting as young adults,

lack strong familial support, and are more likely to quit hunting after a few years, particularly if their peer group changes and individuals who introduced them to hunting are no longer regular social contacts. These persons tend to be more transient in their hunting participation because they lack the learned, strongly held personal identity with the activity and tend to have fewer, less consistent and weaker sources of social reinforcement for participation.

Applegate et al. (1984:61-65) investigated hunter recruitment based on results of the National Survey of Fishing, Hunting and Wildlife-Associated Recreation:

Recruitment was evaluated in two ways. First, there was little difference in rates of recruitment between the states when computed as a percentage of the active hunter population. Apparently recruitment measured in this form is relatively stable, which indicates that a very important determinant of the number of new hunters in any state is the number of active hunters in that state. However, when recruitment was measured as a percentage of the population of a given state, the differences between states were dramatic. Recruitment, in this sense, was found to be a function of the percent of active hunters in the state. Variables that were negatively correlated with recruitment were primarily related to the urban character of a state. The percent of the state living in SMSAs, total state population, and state population density were all negatively correlated with recruitment. A model of hunter recruitment containing three variables—percent of population in SMSAs (negatively correlated); percent of farm or forestland (positive); and cost of a license (negative)—accounted for about 81% of the variation in the dependent variable....

...Management variables such as monies spent by the state on wildlife management, the number of game birds stocked, and hunter success rates, had little relationship to hunter recruitment or desertion rates. The relationship between hunting license costs and recruitment was not strong. As a percent of active hunters, there was little variation in hunter recruitment rates between states. The percent of active hunters in a given state was highly correlated with recruitment expressed as a percentage of the general population.

Based on their extensive research, Applegate et al. (1984:67) recommended that:

Efforts to reduce juvenile mortality, that is, the number of newly recruited hunters who drop out, would be more profitable than efforts to recruit new hunters to sustain a state's hunter population. As hunter retention increases, the number of new recruits should show a corresponding increase, since recruitment is a relatively constant percentage of the active hunter population.

Langenau and Mellon (1980:76) offered insight into programs to increase hunter numbers based on a tailored approach to (1) young hunters who continue to hunt, (2) returning hunters, and (3) hunters recruited at later ages:

Hunters who begin at early ages might be encouraged to strengthen the traditional aspects of their hunting. The family nature of hunting should be emphasized for this group. Wildlife education programs might emphasize topics like game recipes, management of private lands for game, and other utilitarian aspects of wildlife. Regulations should be carefully reviewed to determine any conflicts with traditions. In turn, traditions should be studied to identify the need for new regulations such as party permits and giving preference to landowners.

To increase the number of hunters it would also be necessary to increase the size of the second group [returning hunters]: those individuals who stop hunting for a number of years and then return to the sport later in life. These individuals are influenced strongly by the process of urbanization, and because urban hunters probably are most likely to appreciate the nonconsumptive aspects of hunting, programs that emphasize these qualities of the hunt would be most effective. Wildlife education might be directed at the intellectual rather than utilitarian level. Facts about wildlife biology, rules of hunting, and principles of sportsmanship should be well received by this group. Regulations designed to increase the quality of hunting, such as limiting hunter numbers to divide resources among hunters, would be useful.

Procedures designed to retain potential quitters would probably also apply to the third group: those who begin hunting at older ages. The same technique might be used to increase the number of older individuals who begin hunting. In addition, this group may be extremely sensitive to hunting regulations that influence peer group interactions.

A program might be designed to improve the ethical standards of an individual who hunts. Again, different techniques would be required for each of the three groups. Continuing hunters might be exposed to a kind of value and cultural education in which the illegal and unethical traditions of family hunting lore would be carefully considered and reviewed by young people. Laws concerning road hunting, bag limits and poaching would require more enforcement and increased fines and removal of hunting privileges by the courts. Additional hunter education might also be considered as a court sentence.

In a comprehensive study on antecedents to hunting participation, Decker et al. (1984) identified a number of initiation and continuation parameters and developed a number of working hypotheses (1984:ii-iii):

Hunting Initiation: Tentative Findings and Interpretations:

- Two basic types of hunters were identified: (1) 'family-supported hunters'—(come from families where hunting was a leisure activity and began hunting at age 14 or earlier, often having a 'tag along' apprenticeship period prior to coming of age to hunt legally and (2) 'family-nonsupported hunters'—not exposed to hunting by a family member or did not begin hunting by age 14.

- Family-nonsupported hunters outnumber family-supported hunters by about 3:2. This is an important statistic from a program standpoint considering the less stable hunting participation of family-nonsupported hunters and the resulting desertion rates.
- Family-supported hunters indicated that a combination of family and recreational components were most important, whereas family-nonsupported hunters indicated recreation and social-fraternal components were most important (family was unimportant) during their initial hunting stage. (For some people, the initial hunting stage may be a 'tag along' period prior to being legally of age to carry a firearm afield.)
- Over two-thirds of family-supported hunters who had a pre hunting or 'tag along' stage gave the highest possible rating for their interest in small game hunting at that time, compared to one-third of those without a pre hunting stage and one-tenth of all family-nonsupported hunters.
- The diversity of components used to define hunting during the initiation stage is greater for family-supported hunters than for family-nonsupported hunters.
- Family-supported hunters had a higher interest in hunting than family-nonsupported hunters during their initial hunting stage.
- Females are much less likely than males to be introduced to hunting by parents and therefore women hunters are largely family-nonsupported.
- Individuals who cannot fully participate in deer hunting (i.e., family-supported hunters in a pre hunting stage) or whose hunting is very socially oriented (e.g., family-nonsupported women hunters) receive a variety of rewards associated with deer hunting in New York (e.g., reunion of friends and family, story-telling, special meals, etc.) that apparently are sufficient to generate high interest in deer hunting even though many [of those hunters] have low participation rates.
- Over one-third of the hunters interviewed reported some degree of negative feelings associated with killing game (we believe this to be an underestimate of the degree to which this occurs). This may have considerable importance for hunting continuation or desertion.

Working Hypotheses:

- Family-supported hunters, having a richer, more complex definition of hunting, are more likely to continue hunting beyond the initiation stage, because if one component should be eliminated, these individuals would be more likely to have remaining sufficient other reasons to hunt.
- Taking youngsters afield is important to their development of interest in hunting but it is not necessary that a firearm be carried for interest to be high. The pre hunting state (no firearm carried) was reported to be a time of high hunting interest, which carries over into the next stage when the youngster can hunt with a firearm.
- Big game (i.e., deer) hunting is special in a social-psychological context and is a socio-cultural event for many hunters and their families/friends.

- The unique combination of a person's values and goals/expectations results in that person's being primarily achievement-oriented or affiliative-oriented in his/her motivation to begin hunting.
- The unsuccessful, highly achievement-motivated new hunter may be more prone to unethical or illegal behaviors, because of the frustration and dissatisfaction resulting from lack of achievement.
- Boys 10 to 18 are the most achievement-oriented in their decision to start hunting.
- Women tend to be more affiliative-oriented than achievement-oriented in their decision to hunt.
- The greater the degree to which hunting is portrayed or perceived as an achievement-oriented activity, the more it will discourage female participation.

Hunting Continuation: Tentative Findings and Interpretations:

- Three types of principal motivations influence the decision to continue hunting after being initiated into the activity: achievement, affiliative, and appreciative.
- The importance of family, recreation, and fraternal components of hunting change over time.
- Among family-supported hunters, the family component is very important in preteens, is less important through the teens and early 20s, when the fraternal component gains in importance, and then increases in importance slightly from the late 30s on. The recreation component steadily rises in importance from preteens through the early 40s, then drops quickly to a moderate level, but nevertheless appears to be of primary importance in the middle-adulthood of family-supported hunters.
- Among family-nonsupported hunters, the fraternal component takes a sharp rise in importance in the early 20s and a sharp fall in the late 20s. The importance of the recreation component experiences a reciprocal decline and rise; generally, the recreation component is more important than the fraternal component for family-nonsupported hunters.
- Among family-supported hunters, from age 8-14, interest in small game hunting is greater than that in big game hunting, but from age 16 on the reverse is true, until the 50s, when interest is about equal. Participation in small game hunting is greater than that in big game hunting from age 8 to 14, similar from age 16 to 30, and thereafter participation in big game hunting is greater.
- Among family-nonsupported hunters, interest in both small game and big game hunting peaks in the early 30s, and thereafter declines gradually; at no age does interest in small game hunting exceed that in big game hunting. Family-nonsupported hunters have greater participation levels in big game than small game hunting, especially between the ages of 34 to 40.

Working Hypotheses:

- Hunters generally reach an appreciative orientation for hunting over time, typically starting from primarily an achievement or affiliative orientation; but not all hunters become primarily appreciative-oriented.
- There are three mechanisms whereby highly affiliative-oriented hunters, especially women, may develop a moderate to high interest in deer hunting, yet maintain a low interest in small game hunting:
 - 1) There are affiliative rewards associated with deer hunting not found in small game hunting that strongly appeal to affiliative-oriented hunters; (e.g., family gatherings, hunting camp, etc.);
 - 2) For the men who only hunt deer, if they are the object of the affiliative needs that motivate their spouses to hunt, then their spouses will also only hunt deer, and thus have interest only in deer hunting;
 - 3) Many men hunt both small and big game, but only encourage their spouses to go afield during deer season so an 'extra' deer tag is available.

Decker et al. (1984:vi-ix) put forth a variety of recommendations for influencing initiation and enhancing continuation:

Influencing Initiation:

- Individuals experiencing a pre-hunting stage (typically family-supported hunters) are more likely to initiate hunting when legally of age and to remain involved for a longer time than individuals deprived of pre-hunting experiences. Thus, programming to encourage a pre-hunting stage is of high priority; however, it should not be expected that lowering the legal hunting age would affect the likelihood that more individuals will be recruited into hunting.
- Family-supported hunters have such strong and diverse influences in their hunting activity, it seems unlikely that external programming is required with this group to increase initiation. They are part of a self-perpetuating system of incentives and rewards where little outside influence is required to feed the system. One exception to this laissez-faire approach toward family-supported hunters is in the encouragement of hunting as a family activity, rather than a 'man's sport,' and, for those families with a nonparticipating parent, by other attempts to broaden interest in hunting so that the activity could be seen by the nonparticipating parent as a more desirable use of the youngster's time.
- The characteristics of family-nonsupported hunters present a variety of opportunities for influencing their hunting activity. They differ fundamentally from family-supported hunters in that they have fewer reasons for initiation into hunting. Basically, increasing the breadth of reasons for hunting, or components of hunting as we have referred to them, will result in increasing the likelihood of both initiation and continuation. Recreation and fraternal affiliation were the most important

components for family-nonsupported hunters during initiation—broadening component diversity would likely increase the motivation to hunt. This might be accomplished by promoting the largely unrecognized (i.e., by our study group) economic and health aspects of hunting.

- Family-nonsupported hunters who are teenagers, especially younger teenagers (younger than 16 years old), may be effectively provided pre hunting experiences, such as that enjoyed by family-supported hunters, via innovative programs. In this situation, programs that provide pre hunting role models (in essence, surrogate parents) seem most on target. Youngsters are more likely to get involved if their first experiences are positive and expose them to the diversity of benefits that can be derived from hunting. Programs that create the pre hunting, apprenticeship stage and offer exposure to a full ‘benefits package’ may go a long way toward increasing initiation and ensuring continuation. Such programs would have to provide considerable ‘pre hunt youth/role model’ contact—contact that should be frequent and over a period of time. It will be necessary to enlist the help of and to work with hunting clubs (role models) and youth agencies such as 4-H.
- Potential hunters decide not to hunt for one or both of two kinds of reasons: affiliative reasons and reasons related to killing of game. Hunter training programs need to address these reasons to enhance recruitment into hunting.
- Means of decreasing affiliative desertion and of increasing initiation of affiliative hunters will also apply to potential hunters who decide not to hunt for affiliative reasons. It may be advisable to have clubs recruit members at hunter training courses so immediate affiliative links are facilitated.
- Hunter training courses should develop and use teaching aids which would ease an individual’s apprehension over killing game. To help the potential hunter overcome this apprehension, the ‘kill’ should be placed in the context of the entire hunting experience—planning, talking to friends, selection of equipment, pursuit of game, the kill (maybe), then dressing, storing, preparing and consuming game, as well as re-creating the event for friends. Also, discussion of ethical considerations related to meat consumption may help, i.e., a person is just as ‘responsible’ for the death of an animal whose meat the person has purchased in a store as he is for killing the animal personally.
- Only about one-half of the individuals we studied following the hunter training course and classified as potential hunters actually will hunt, implying that communications efforts might be wasted on these individuals. Although this audience has the advantages of not being opposed to hunting, being legally able to hunt (certified), and not having overtly discounted participation, their participation is highly improbable unless they are initiated for strongly affiliative reasons. And even then, participation rates are likely to be low. Furthermore, unless they are sustained by affiliative reasons, rapid desertion is likely unless some

powerful intervention program is in effect to facilitate broadening their reasons for hunting to include more than the fraternal/familial component as important aspects of hunting for them.

Enhancing Continuation:

- Among the ways continuation in hunting might be enhanced emerged the idea of increasing people's interest in small game hunting. A strategy for doing so is to promote the attractive aspects of small game hunting that are similar to those our subjects attributed to big game hunting. Big game hunting was portrayed as a socio-cultural event, having a variety of dimensions that resulted in people's having high interest in big game hunting even if their participation level was low. This socio-cultural event phenomenon made big game hunting especially attractive to affiliative hunters. If the perception of small game hunting could be modified so that it more closely approached that of big game, small game hunting interest might increase, resulting in more opportunity to meet the affiliative hunter's needs.
- A new hunter may have either achievement or affiliative motives (or a combination of these) for hunting. Highly achievement-oriented initiates may have a greater propensity for unethical hunting behavior if achievement needs are not adequately met by a degree of hunting success. And if the highly achievement-oriented hunter is repeatedly unsuccessful, to his/her satisfaction, this hunter will quit hunting. Programs to influence these hunters should have three dimensions: 1) Initially (via hunter training courses, etc.) try to ensure that new hunters have a realistic view of hunting success—be sure expectations reflect reality. 2) Provide opportunities or encourage hunters to avail themselves of existing opportunities to exercise or demonstrate their hunting skills, especially shooting. Possibly all new hunters should be encouraged to join an active sportsman's club or other organization where shooting sports are pursued. 3) Try to temper the achievement motivation of highly achievement-oriented hunters by stressing the affiliative and appreciative aspects of hunting.
- Hunters' interest and participation levels in big game and small game hunting change over time as they move from one stage of their hunting lives to another. Furthermore, the fundamental components in their definition of hunting also change, from stage to stage. Recognizing that the most frequent changes occur between initiation and age 30 (or about 10 to 15 years hunting experience) brings into perspective the difficulty in targeting communications or specific hunting opportunity programs for the below age 30 group. Nevertheless, some objectives of communications and management programs need to be consistent regardless of age, e.g., increase the diversity of components of hunting (family, fraternal, recreational, health, economic) for individuals, move hunters toward a predominately appreciative orientation, and diversify hunters' interest in types of hunting (big game and small game). After age 30, stages are

fewer and changes in stage structure are less conspicuous. Consequently, communications and management programming could be more consistent. As the population structure over the next two to three decades tends to have an increasingly larger percentage of middle-aged people (U.S. Census predictions), many hunter programming considerations will be required to deal more specifically with this group because it will comprise a greater segment of the hunter population.

- There is some evidence in support of structuring hunter education programs (e.g., hunter training courses) at two levels: for <16-year-olds and for >16-year-olds. This suggestion stems largely from data showing a dichotomy in primary hunting interest—<16-small game / >16-big game—and from basic understanding of differences in teaching approaches for these age groups.

Purdy et al. (1985) studied the hunting participation of individuals who graduated from a hunter training course in New York state in 1983 and found that 80% of graduates who were 15 years old or younger continued hunting 5 years later, compared to slightly more than half who took the course at older ages. Desertion after 5 years was nearly twice as likely for individuals who took the course at 16 years of age or older than for those who took the course at younger than 16 years of age (9% versus 5%). Purdy et al. (1989:13) noted:

The significant aspect of the relationship...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 who introduces them and how 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. (1986) 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.

Purdy et al. (1989:17) continue:

Other people, not magazines, TV shows, or other forms of communication, recruit new hunters. Previous research has shown that two 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.

A number of researchers have suggested the use of surrogate role models to initiate youngsters to hunting (Applegate and Otto 1982, Decker and Purdy 1986, Brown et al. 1987). For example, Brown et al. (1987:563) stated: "Meaningful opportunities need to be created for many youth to experience a hunting 'apprenticeship' under the tutelage of a surrogate adult role model (i.e., nonparent). Without the provision of such opportunities, the interest in hunting expressed by youth from family situations where interest cannot be reinforced may be forever lost.

Fishing

Initiation

Fishing initiation is largely a function of the family (Responsive Management 1995, 2001a, 2001b). Most anglers were introduced to fishing by their father and generally fished with their father as a youth, and most young children prefer to fish with their father. The issues of family surrounding fishing initiation are strong and pervasive, and any understanding of fishing activity must begin within the context of childhood memories and initiation (Responsive Management 1995, 2001a). "Programs that seek to augment initiation, particularly with young girls, should aim at complementing these natural processes by targeting fathers. Fathers are the most frequent and most highly desired points of contact for fishing experiences with all members of a family. Appeals to fathers should aim at including wives and daughters in the sport" (Responsive Management 2001a:20).

The American Fishing Tackle Manufacturers Association (AFTMA) (1990) found that, nationwide, 88% of freshwater anglers started fishing before they were 20 years old, and 57% started fishing before they were 10 years old. A subsequent AFTMA-sponsored (Harrington Market Research 1992) study found that almost 70% of all anglers began fishing before 9 years of age. The AFTMA performed a trends analyses over three studies to provide insight into changing demographics (Harrington Market Research 1992:23): "Interestingly, the percent of anglers who are 10 to 13 years of age increased with this [study] from 7.7% of the angler population to 9.0%. The index of anglers aged 10 to 13 to the percent of the U.S. population aged 10 to 13 increased 24 points from 143 to 167—the largest increase of any age groups. Perhaps this increase is the result of local fishing programs targeting kids."

Among Colorado anglers, the average age that anglers began fishing was 10 years old. A strong majority, 65%, of anglers were introduced by their father, 10% by their friends, 9% by their grandfathers, 3% by their mothers, 3% read about it, and 3% were introduced by a brother (Galloway Vigil & Associates and Market Analysis Professionals, Inc. 1986). In New York, the average age at which an individual began fishing regularly was 13.3 years old (Connelly et al. 1990). In Ohio, McClaskie et al. (1986) found that the most important factor for predicting participation in fishing was the principle income earner's participation in traditional recreational activities as a youth, followed by ease of access. Marital status and participation by friends were not important variables.

Finally, Responsive Management (1996a) found that, nationwide, almost half (49%) of all freshwater anglers began fishing in elementary school, 36% started fishing in their preschool years, 7% started fishing in their teens, and 8% started in their adult years. These findings suggest that if children are to become avid anglers later in life, they have to be exposed early, and in the context of family.

Recruitment of Youth Anglers

Within the specific context of aquatic education and angler education, Dann (1993) investigated the recruitment of youth into fishing in Michigan as influenced by familial, social, and environmental factors. Dann projected that the rapidly changing age structure may greatly affect the number of youth fishing participants. Overall, the average age in Michigan is increasing for two interconnected reasons: “baby boomers” are maturing, and the number of youth is declining. Dann shows a decrease in the age cohorts less than 5 years of age, 5 to 17 years of age, and 18 to 24 years of age, while there are increases in age cohorts of nearly all other groups. Thus, while fishing is a nearly universal activity among youth, the number of youth participants may be declining in Michigan simply because the population of youth is declining in Michigan.

Dann (1993) investigated family structure, income, and place of residence as factors explaining youth fishing recruitment. She concluded that socialization was a significant predictor for future fishing behavior and activities. Among avid anglers, the most common denominator was high fishing involvement in childhood and as teenagers. High fishing involvement as an adult was also found to be related to participation in fishing-related activities during childhood.

Dropout rates in fishing are associated with age as well. As age increases, youth anglers either become highly avid, fishing many days per year, or they tend to drop-out of the activity altogether. Dann (1993) suggests that this dropout rate in the teen years may be indicative of the increased need of teenagers to have activities of high socialization, their greater involvement in school and cultural activities, and competing interests.

Responsive Management (1999a) stated:

It appears that it will prove very difficult to “sell” teenagers on going fishing unless they are already avid anglers. Despite the fact that there was a relatively high level of interest in fishing among 12 to 15 year olds in the survey, the focus groups indicated that movement from interest to angling will be complicated. Promotional campaigns for teens should focus on those already actively involved in fishing as initiation at these ages is unlikely.

Promotional campaigns need to show average people and their children fishing. In the focus group there was interest in seeing “normal” people in ads and promotions. In some cases, especially [for] African-Americans, [a promotional campaign] needs to show ethnic diversity and representation. However, the important issue is the use of people [with] similar socio-economic backgrounds as the target audience. There is evidence that showing families fishing together will produce a positive response.

The “family” aspect of fishing is more important than the utilitarian or recreational aspect of fishing alone.

Retention of Youth Anglers

The literature on teenagers’ involvement in fishing indicates that the teenage cohort is a problematic group. Dann found a general decline in fishing participation during teenage years across the population (Dann 1993). Whether the limited research available (Responsive Management 1998; Dann 1993) can be extrapolated to the larger population remains to be seen, but there are some observations and recommendations that can be inferred. Teenagers are highly influenced by peers. Schools and other organizations could be encouraged to offer fishing as an educational and recreational opportunity for teens. Dann (1993) noted that these opportunities do not need to be specifically fishing. Reading about fishing, cooking and eating fish, making lures, and group activities in which fishing is included can all be factors related to recruitment (Dann 1993).

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RESPONSIVE MANAGEMENT

RESPONSIVE MANAGEMENT is a nationally recognized public opinion and attitude survey research firm specializing in natural resource and outdoor recreation issues. Our mission is to help natural resource and outdoor recreation agencies and organizations better understand and work with their constituents, customers, and the public.

Utilizing our in-house, full-service, computer-assisted telephone and mail survey center with 65 professional interviewers, we have conducted more than 1,000 telephone surveys, mail surveys, personal interviews, and focus groups, as well as numerous marketing and communication plans, needs assessments, and program evaluations.

Clients include the federal natural resource and land management agencies, most state fish and wildlife agencies, state departments of natural resources, environmental protection agencies, state park agencies, tourism boards, most of the major conservation and sportsmen's organizations, and numerous private businesses.

Responsive Management also collects attitude and opinion data for many of the nation's top universities, including Auburn University, Colorado State University, Duke University, George Mason University, Penn State University, Michigan State University, North Carolina State University, Rutgers University, the University of California-Davis, the University of Florida, the University of Montana, the University of New Hampshire, the University of Southern California, Texas Tech University, Virginia Tech University, West Virginia University, and others.

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Responsive Management has conducted research on numerous natural resource ballot initiatives and referenda and helped agencies and organizations find alternative funding and increase their membership and donations. Responsive Management has conducted major organizational and programmatic needs assessments and helped natural resource agencies and organizations develop more effective programs based upon a solid foundation of fact.

Responsive Management conducts training workshops on the human dimensions of natural resources and presents numerous studies in presentations, workshops, and as keynote speakers at major natural resource and outdoor recreation conferences and meetings.

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- Park/Outdoor recreation intercepts
- World-Wide-Web-based surveys
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RM develops:

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- Outreach plans
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