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ABSTRACT

A study examined the learning and character development effects of the outdoor wilderness experience. The research consisted of a retrospective study in which surveys were completed by 429 participants in outdoor programs sponsored by the Student Conservation Association, the National Outdoor Leadership School, and Outward Bound; and a longitudinal study in which surveys were completed before, after, and 6 months following participation in an outdoor program. Most respondents reported major impacts on their personal and intellectual development as well as outdoor recreational and environmental interests. A smaller but substantial minority viewed the experience as significantly affecting their career interest and inclination to contribute community service. This highly positive outlook did not diminish over time. Most respondents reported far greater respect, appreciation, and spiritual connection with nature, and professed a stronger commitment to conservation and stewardship of the environment. Still, the actual degree of change in conservation behavior was limited and diminished over time. Substantial improvements in outdoor skills and interest in biology and natural history were noted. Increases in self-confidence, self-esteem, independence, autonomy, and initiative were reported. Substantial, although less striking, changes were observed in many elements of interpersonal relationship. The benefits reported stem from experiential, outdoor, and integrated components of the wilderness learning experience, which should be incorporated into conventional educational curricula. Appendices present a bibliography of related research, an outline of research variables, the surveys, and an interview. (Contains 73 references and many statistical figures.) (TD)

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With the Assistance of Victoria Derr

Yale University

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CHAPTER ONE

INTRODUCTION AND OVERVIEW

The social philosopher, John Dewey, once suggested that all education should derive from experience, reflection, and practical skills. Few would quarrel with this admonition, yet our society has largely opted for a different educational paradigm, one mainly emphasizing abstract and specialized learning, lacking direct experiential and practical connection with the focus of the learning, and largely occurring indoors. Examples abound, but most relevant to our study is how often education today assumes a narrow and highly theoretical focus in the classroom rather than involving direct outdoor experience, and how the formality of the textbook takes precedence over less structured problem-solving in the natural environment.

Education based on formal, specialized, and indoor learning certainly has its advantages, particularly when emphasizing complex cognitive, scientific, and technical knowledge and skills. Many increasingly question, however, whether this type of education can consistently produce highly adaptable, creative, and motivated young people. Moreover, serious doubts exist regarding the capacity of traditional education to foster confidence, self-esteem, and character development among young people. Youth are often reminded today of how little control they possess over their socially and technically complicated lives. Moreover, our reliance on indoor experience and print and visual media offer little physical and direct stimulation on an everyday

basis. A highly urban and populated society provides fewer opportunities for young people to encounter unpolluted and undeveloped natural settings.

These trends have encouraged a dramatic growth in environmental education, particularly outdoor education in relatively pristine areas. This expansion reflects the convergence of two major concerns. One, a recognition of the need to better equip young people with the attitudes and skills necessary to ameliorate a wide range of serious environmental problems facing humanity today. And, two, a growing belief in the importance of outdoor experience as a way of fostering productive, creative, and self-confident young people. Thus, the convergence of two crises – one educational and the other environmental – have precipitated a dramatic increase in environmental education activities, particularly outdoor programs involving challenge, adventure, and sometimes service in undeveloped, often wilderness settings.

Three well established national organizations in the field of outdoor education are the Student Conservation Association (SCA), the National Outdoor Leadership School (NOLS), and Outward Bound (OB). Each organization has been in existence for at least a quarter century, and all three have excellent reputations for the quality and care of the programs offered. Major differences exist, however, in emphasis and philosophy – OB tends to be more challenge oriented, SCA focuses more on environmental service and conservation, and NOLS places greater emphasis on interpersonal relations and leadership skills. Yet, all these organizations similarly stress personal growth and development through the outdoors, particularly in wilderness settings, and the importance of fostering appreciation and stewardship of the natural environment.

Various studies have been conducted of outdoor adventure and wilderness programs. An annotated summary of methods and results of many of these studies can be found in Appendix A. These findings generally indicate the outdoor experience can have considerable impact on participants, particularly a wide range of physical, intellectual, emotional, and even moral and spiritual benefits. Physical impacts, for example, include enhanced fitness, stamina, and strength. Emotional effects often include increased self-confidence, self-esteem, and a greater sense of personal meaning and direction. Intellectually, major impacts include improved critical thinking and problem-solving skills, and enhanced creativity and focus. Many participants of these programs also cite various moral and ethical effects including enhanced peace of mind, awe and wonder of nature, spirituality, and a stronger appreciation and commitment to conserve the natural environment.

Yet, the evidence supporting the positive impacts of the outdoor experience is often fragmentary, anecdotal, and based on studies involving small and restricted populations. This lack of sufficient and rigorously derived data has been particularly evident in the case of the Student Conservation Association. Our understanding of the oldest and most studied organization, Outward Bound, also remains partial and insufficient, and OB has never been examined in relation to the other two national organizations.

This lack of adequate evidence and information regarding the impact of the outdoor wilderness experience prompted one of the organizations, SCA, to work with the principal investigator to obtain funding for a major national project. Support for this research was eventually secured from the charitable assistance of the National Fish and Wildlife Foundation, the Richard King Mellon Foundation, the Johanette Wallerstein Institute, and an anonymous

donor. In addition, NOLS, SCA, and OB provided considerable cooperation and generous personnel support in making this study possible.

Problem Definition and Methodology

To reiterate, this study's primary objective was to achieve a better understanding of the impact of the outdoor wilderness experience. This is a relatively straight-forward goal, yet considerably more complex when trying to be explicit about the nature of the impacts involved.

A major distinction is whether we are assessing the impact of the outdoor activity on the environment or the effect of the activity on the participant. Resource managers have devoted considerable attention toward examining the environmental impacts of growing numbers of outdoors enthusiasts including participants of outdoor adventure and wilderness programs. A primary objective of SCA is in fact to conserve and restore natural environments affected by various outdoors activities. Despite the importance of this issue, the focus of this research is not the environmental impact of outdoor recreation but rather the effect of the outdoor experience on the participant. We consider impacts of outdoor recreation on the environment only to the extent of how wilderness programs may affect subsequent attitudes and behaviors in the outdoors.

As indicated, we reviewed a wide body of literature to identify and define relevant kinds of physical, emotional, intellectual, environmental, and moral-spiritual impacts associated with extended experience in outdoor principally wilderness settings. As noted, brief descriptions of the methods and results of these studies are provided in Appendix A. Thus, we will only highlight here some of the critical variables emerging from these studies that we chose to emphasize in our research.

A number of important physical impacts have been noted. Wilderness experience by definition occurs in roadless and often difficult terrain – in the United States, in mainly mountainous, heavily forested, desert, and canyon areas. Successfully negotiating and traversing these environments has typically been found to foster physical fitness, endurance, stamina, strength, and coordination.

Effectively coping and adapting to backcountry conditions also requires various skills and intellectual and problem solving abilities. Relevant skills, for example, can include map and compass reading, fire-setting, rope tying, climbing, cooking and, in general, a capacity for dealing with unknown and unexpected situations. Acquiring these techniques, particularly the ability to resolve new and challenging situations, can enhance critical thinking and problem-solving capacities. In addition, learning about the natural environment, whether simple plant and animal identification or more complicated ecological and geological knowledge, can foster cognitive and intellectual capacity.

Effectively coping in wilderness and outdoors settings can also enhance emotional and affective development. Some of these impacts include increased self-confidence, self-esteem, optimism, independence, and autonomy. Moreover, when these accomplishments depend on working with others, they can foster various interpersonal abilities including enhanced cooperation, tolerance, compassion, intimacy, and friendship.

The wilderness experience has also been related to a greater awareness, appreciation, knowledge, and concern for the natural environment. Some of the literature has noted this impact, although the extent and depth of the factual environmental understanding and responsibility acquired has been debated.

Finally, studies suggest intense encounters in unfamiliar and challenging environments can foster moral and spiritual development. Relevant impacts include enhanced calm and peace of mind, feelings of harmony and connection, and spiritual wonder and awe.

These and other elements of physical, emotional, intellectual, environmental, and moral development can, of course, occur as a result of many other kinds of life experience. Still, the literature suggests the outdoor, especially wilderness, experience can be a powerful means for personal and character development, as well as enhanced appreciation and awareness of the natural world, particularly among young people. For example, Schreyer **et al.** (1990:25) suggest: "While not unique in its ability to afford self-concept enhancement, wilderness possesses many attributes particularly well suited to the development of self-concept, especially the presence of obstacles, challenges; opportunity for solitude, freedom from social forces, and enhanced ability to focus on self." Kiewa (1994:36) additionally believes this learning environment may be especially effective because it offers "a simple yet meaningful reality, [typically involving] cooperation and intensity of feeling."

Our review of the research literature, thus, resulted in deciding to examine the following possible impacts of the outdoor wilderness experience:

- Environmental awareness and knowledge
- Environmental attitudes and ethics
- Career choice and community service
- Outdoor recreational interests, activities, and skills
- Personal values and beliefs
- Interpersonal relationships

- Critical thinking and problem solving
- Self esteem and self concept
- Academic interests and performance
- Physical fitness and well being

Each of these dimensions represents a complex of variables requiring further delineation and explanation. This description is partially provided in Appendix B in outline form.

Methodologically, we decided to pursue a largely quantitative understanding of these various character building and environmental awareness impacts of the outdoor experience. Our hope was to meet the challenge posed by Williams **et al.** (1988: 174): "There is a tremendous need to articulate...the benefits [of the outdoor experience] to our culture, as well as to generate reliable, useful, and systematic data...No comprehensive effort at evaluation has ever been attempted."

As noted, we chose to focus on the programs of three national organizations – the Student Conservation Association, the National Outdoor Leadership School, and Outward Bound. To reiterate, these organizations were chosen because:

- Each organization has been in continuous operation for more than a quarter of a century and this length of time offered a chance to examine long as well as short-term impacts of the experience.
- By including national organizations we could minimize the effects of regional and other demographic biases.
- Each organization possesses an outstanding reputation for safety, quality, and standardization of program.

- Although these organizations share many features in common, each has a distinctive emphasis and organizational culture, allowing us to explore differences as well as similarities of impact.

Some potential difficulties associated with differences among the organizations should be noted that somewhat complicated our ability to draw generalizations and make comparisons. The Student Conservation Association offers three distinct programs, some quite different from one another and from NOLS and OB. SCA programs include: a high school (HS) program similar in many ways to NOLS and OB in terms of wilderness exposure, group orientation, and participant demographics; a Resource Assistant (RA) program involving mainly college students, typically majoring in environment science and management, and with a more individual than group orientation; and a Conservation Career Development Program (CCDP) targeting urban minority youth and promoting careers in the natural resources field. SCA HS and CCDP participants were included in both the retrospective and longitudinal studies, while RA participants were also involved in the retrospective research. Our results emphasize impacts on SCA HS participants because of the desire to assess and compare relatively similar participants in all three organizations.

Outward Bound results were somewhat affected by this organization's decentralized structure. Outward Bound is organized around regional Schools, each having considerable autonomy and often a distinctive character and outdoor emphasis. Six Outward Bound Schools occurred in the United States at the time of the research, and many others exist throughout the world. Two American OB schools participated in this research – the North Carolina School in

the retrospective study, and the Portland, Oregon School in the longitudinal research. These differences in OB participation may have somewhat affected the results.

Many organizational and situational factors can influence the impact of the wilderness experience including the outdoor setting, length of time, participant age and other demographics, size of group, prior experience and motivation of participants, group leader training and skills, and organizational philosophy and objectives. By including three organizations, we had the opportunity to explore the impact of some of these variations. It should be, nonetheless, **emphasized** that our research was **primarily** concerned with the overall impact of the wilderness experience, and was not especially focused on making comparisons or evaluative judgments among the organizations.

Another major methodological consideration was whether to study persons who participated in an outdoor program at some point in their life or focus on current participants at the time of the experience. This difference is sometimes called "retrospective" and "longitudinal" research.

Advantages of retrospective study are typically a greater ability to examine effects over longer periods of time, among a comparatively large sample, and include many kinds and ages of people. Major deficiencies frequently include data distorted by recalling the past, and a typically higher response rate among those who feel stronger about the experience, frequently in a positive way. Longitudinal research can avoid these problems, typically resulting in more valid and reliable data. On the other hand, major limitations of longitudinal research often include much higher costs, significantly smaller and less diverse samples, and difficulties in evaluating long-term impacts. Clearly, each research approach offers distinctive advantages and disadvantages.

Despite the additional logistical impediments and costs involved, we chose to conduct complementary retrospective and longitudinal studies.

The sample for our retrospective research was drawn from randomly selected lists of past participants of the three organizations. To avoid possible confounding of the results, we included only persons who participated at some point in the past in **only one** of the organizations programs. SCA and NOLS samples included past participants of programs in various sections of the United States, although principally in the West, while the OB sample was drawn from alumni of the North Carolina Outward Bound School. Retrospective data was collected by mail survey during the fall 1996 through spring 1997.

The longitudinal study collected data just prior, immediately following, and six months after participation in one of the three organizations programs. Data obtained before and immediately after program participation occurred in person, while the six-month follow-up relied on mail data collection (a more in-depth interview with a smaller number of participants occurred by telephone). The NOLS sample was drawn from participants of programs in the intermountain and southwestern states, all originating in Lander, Wyoming. The SCA sample included participants of programs in the intermountain and northwestern states. The Outward Bound sample was selected from the Portland, Oregon OB School, whose programs take place in the Pacific northwest. Data collection before and immediately following program participation occurred in the summer 1997, while the six-month follow-up was completed in the winter 1998.

The principal means of data collection was a largely closed-ended and standardized survey. We employed this data collection procedure for a number of practical reasons including:

- The relative ease of collecting large amounts of data on a wide variety of issues and variables.
- The ability to include a larger sample size, expediting comparisons among various kinds of participants.
- The ability to collect standardized response data, facilitating statistical analyses and comparisons.
- The relative affordability of survey data collection.

The survey included questions on all the previously cited character development and environmental awareness issues. The breadth and scope of the subjects covered resulted in some sixty questions and more than 900 variables. Almost all questions used standardized closed-ended response categories, generally a five-point scale ranging from strongly agree to strongly disagree. A number of open-ended questions were included to obtain more qualitative data.

The surveys used in the longitudinal study were based on the one employed in the retrospective research, although slight variations occurred. The before program survey included questions on prior outdoor experience, anticipated program effects, and other baseline data. The immediately following program survey was nearly identical to the one used in the retrospective study. The six-month follow-up survey omitted a number of less critical questions to reduce respondent burden and hopefully increase the mail response rate. Copies of the retrospective and one longitudinal survey are included in Appendix C (we omit two of the longitudinal surveys to reduce the length of the report, but these surveys can be obtained upon request).

The longitudinal study also included an in-depth interview involving standardized but largely open-ended response questions. A single participant in each individual outdoor group

was the focus of this interview. The interview was conducted to generate more qualitative understanding of program impact. A copy of the in-depth interview is provided in Appendix D.

Cost considerations and the length of the survey (on average 30-45 minutes to complete) resulted in employing mail data collection in the retrospective research and the six-month follow-up of the longitudinal investigation. In the retrospective study, approximately 1,700 surveys were mailed to randomly selected past participants of the three organizations. Four hundred and twenty-nine surveys were completed, yielding an overall ~25% response rate. SCA participants had the highest response rate (240 of 700 or 34%), NOLS the next highest (130 of 600 or 22%), and Outward Bound the lowest response rate (59 of 400 or 15%). It should be noted, however, that an estimated 300 mail surveys were ineligible either because they had an incorrect or no forwarding address, or because the respondent had participated in more than one organization's programs. If we subtract these surveys, the response rate among persons in the retrospective study who received a survey and was eligible to participate was approximately 31%. This limited response rate and associated potential for bias underscored the importance of the longitudinal investigation.

In the longitudinal study, nearly all participants contacted at the time of their programs completed before and immediately following surveys. As indicated, the six-month follow-up survey was mailed, and in-depth interviews conducted by telephone. The six month survey response rate was ~50%, and the in-depth interview ~80%

Comparisons among organizations indicate the respondents were roughly similar in gender and age and population of residence (at time of program participation). Still, some major demographic differences occurred. NOLS respondents tended to have significantly higher family

income levels, and SCA RA and NOLS participants tended to be less ethnically and racially diverse.

Chapter two presents the results of the retrospective research and chapter three the findings of the longitudinal study. To expedite and simplify these presentations, figures rather than tables are used in depicting the findings. Also, to facilitate the reading of the chapters, figures are placed at the end of chapters two and three. A forthcoming Appendix will present tables and associated tests of significance to provide a more statistical summary of the results. The final chapter reiterates the study's objectives and findings, offering some causal explanations for the revealed impacts of the outdoor experience, concluding with some recommendations for improving this activity, making it more widely available, and briefly discussing the broader educational implications of the findings.

CHAPTER 2

RETROSPECTIVE STUDY RESULTS

This chapter reviews the findings of the retrospective study – i.e., the impact of the outdoors experience on persons who at some point in their life participated in an SCA, NOLS, or OB program. As indicated, we excluded persons who participated in more than one organization's programs to avoid confounding of the results. Four hundred and fifty persons completed the mail survey, ranging in age from 23 to 56.

We initially review the overall impact of the experience and the reasons why respondents participated in these programs. We then examine the effects of participation on respondents' environmental knowledge, behavior, and attitudes. Finally, we explore program impacts on varying aspects of character development and interpersonal relationship. Findings are presented for respondents as a whole, among the three organizations, and between participants distinguished by year since program participation. To expedite the presentation, we highlight largely statistically significant findings and rely on figures for depicting the results. As indicated, a forthcoming Appendix will provide a tabular presentation of findings and associated tests of significance.

Overall Impact

One of the most striking results of the retrospective study was the perceived overall impact of the outdoor experience. Figure 2-1 reveals that an extraordinary 72% of participants

viewed the experience as "one of the best" in their life, the balance mostly rating it as very or moderately good, and only a negligible proportion reporting the programs as either not very good or they would never do again. In addition, 85% indicated their participation had been "very worthwhile," with 70% and more reporting this degree of program impact on their interests in outdoor recreation, personal development, and environmental concern (Figure 2-2). By contrast, approximately 30% believed the program experience had strongly affected their interest in community service and career choice. Finally, Figure 2-3 reveals 78% of participants believed their program experience had exerted a major influence on their life.

These findings are impressive and dramatic, although lacking detail regarding the specifics of the impact, program elements associated with these effects, and an indication of their long-term importance. Some of these issues will be covered in later sections, although many warrant further investigation. In terms of long-term impact, a remarkable 80% of respondents who participated in their programs 6 or more years ago rated it as one of the best experiences in their life, a figure slightly **higher** than that reported by participants whose programs occurred 3-5 or less than 2 years ago (Figure 2-4).

Among organizations, Figures 2-5 & 6 indicate the most pronounced overall impact occurred among SCA and NOLS participants, although these findings are largely statistically insignificant. OB respondents generally reported less pronounced impact, although the great majority rated the experience as one of the best in their life. The least impact was noted by SCA-CCDP participants, despite the more positive views of SCA-HS and RA respondents, although the great majority of CCDP participants nonetheless regarded their experience as very worthwhile and significant.

Regarding reasons for participation, adventure was the most frequently cited motivation, rated as very important by nearly 80% of participants (Figure 2-7). Other reasons cited by a majority of respondents as very important included acquiring outdoor skills, being away from everyday settings, and personal development. The least frequently cited reasons for program participation included family pressure and an interest in making new friends (Figure 2-8). More than 40% of respondents also reported as unimportant the desire to clarify their values or improve problem-solving skills. Nearly 30% cited as unimportant an interest in improving physical fitness or learning more about the natural environment. Recent participants more often cited as important motivations improving problem solving skills, clarifying values, and enhanced leadership abilities (Figure 2-9). Among organizations, NOLS respondents emphasized more often their interest in personal development (e.g., working with others, developing leadership skills), obtaining outdoors skills, and improving physical fitness (Figure 2-10). SCA respondents more frequently cited learning about the natural environment, protecting and conserving nature, and contributing beneficial work. Outward Bound, as well as SCA-RA and CCDP respondents, more often stressed career development as an important reason for participation.

We close this section with some illustrative and often moving participant impressions regarding the overall impact of the experience.

> *On a personal level, it helped me to believe that if there is anything I really want to do in life, I have the ability to do it. All I have to do is look deep inside myself and I can find a way.*

The program helped me realize who I was and how I fit into the world around me. This realization affects every decision I make in my life.

It gave me an unbelievable confidence in myself. I found a beauty, strength, and an inner peace that I never knew was present.

After five weeks, I realized that the world is my home, the stars are my roof, the dirt my floor. I can no longer isolate building life (urban life) from the rest. I know that everything we do affects everything else. The great web.

The program gave me the opportunity to face challenges and the knowledge and the strength to succeed.

The program taught me that one person can in fact make a significant difference in this world.

I learned the most I ever learned, the most about life, myself, and skills I still use everyday.

The significance of the overall experience conveyed by these respondents is striking. The combination of statistical results and qualitative impressions suggests many believed it had been a life-changing event. These participants often viewed their experience as a kind of "conversion"

event, with many having become a fundamentally different person. This impression is elucidated by the findings of the next two sections.

Environmental Interest, Knowledge, Attitude, and Behavior

Most respondents reported major impacts on varying aspects of environmental knowledge, interest, concern, and behavior as a consequence of program participation. Seventy-eight percent indicated substantially greater environmental awareness, and 72% noted becoming more environmentally responsible. Figure 2-11 indicates some four-fifths or more believed their environmental awareness, knowledge of human impacts on nature, and interest in and understanding of conservation had been very or moderately influenced by program participation. A majority or more reported this degree of impact on their knowledge of wildlife, ecology, meteorology (weather), and natural history. The least perceived impacts on environmental knowledge occurred in the areas of hydrology, conservation groups, environmental justice issues, government agencies, and natural resource laws (Figure 2-11).

Diminishing impacts over time were indicated by significantly lower reported effects on knowledge of conservation, wildlife, human environmental impacts, and meteorology, as well as concern for water pollution, litter, and habitat destruction among respondents who participated six or more years ago in comparison to more recent participants (Figures 2-12 & 2-13). Organizational differences were generally insubstantial. Figure 2-14, however, indicates NOLS and OB participants reported greater program impacts than SCA participants in knowledge of outdoor skills including map reading, orienteering, and wilderness survival. On the other hand, SCA respondents reported greater program impacts on their knowledge of conservation activities

including trail building, restoration, and natural resource management. Both SCA and NOLS participants indicated greater concern than OB respondents for various environmental issues including overuse of the national parks and loss of open space (Figure 2-15).

Program impacts on attitudes toward the natural environment were especially striking and pronounced. Figure 2-16 reveals 70-90% of respondents reported strong to moderate impacts on feelings of resourcefulness and self-reliance in the natural environment, interest in outdoor and wilderness recreation, humility and spiritual connection with nature, desire to acquire outdoor skills, and interest in reducing litter and waste. Figure 2-17 also reveals 40% or more of respondents indicated their program experience had greatly influenced their respect, awe, stewardship, aesthetic appreciation, and inclination to make sacrifices to protect the environment.

Diminishing program impacts were suggested by less pronounced program influences on various environmental attitudes among respondents who participated more than six years ago in comparison to more recent participants (Figures 2-18 and 2-19). Few significant differences occurred among those who participated during the previous two years versus 3-5 years ago. Few statistically significant differences occurred among organizational participants in impact on environmental attitudes.

We offer several participant remarks indicative of substantial and often quite moving impacts on knowledge, awareness, and concern for the natural environment.

> *Before the program my feelings of ethical responsibility and stewardship were just ideals. Through the program, I gained confidence and incentive to actually act on these feelings. Ever since, I have felt a connection with the environment and a desire to continue that stewardship.*

I came to believe that in destroying nature and altering it without really understanding its complex ways we destroy ourselves – spiritually, psychologically, and physically.

Nature was something to admire. Now it is something to respect, love and protect.

[The program helped me to] know that without nature there's no way one can live to the fullest. Everything in the world is derived from the earth and by not caring for our environment we will perish.

When you are out, away from society and civilization for any extended amount of time you realize what we really and truly come from and what we are really and truly about. How can we destroy what has created and nurtured us?

It taught me that I owe a lot to the environment, but more importantly it taught me that I should love, respect, and enjoy the environment.

A great many respondents reported substantial changes in outdoor recreational interest and activity and, to a lesser extent, conservation behavior as a consequence of program participation. Figure 2-20 reveals a 10% or more increase in backpacking, camping, scientific study, rock and mountain climbing, and hiking activities following participation. By contrast,

only negligible or declining activity rates occurred in hunting, fishing, and skiing. Figure 2-20 indicates more than 40% of respondents reported greater knowledge of such outdoor skills as minimum impact camping, map and trail reading, wilderness camping, identifying human impacts on the environment, first and emergency aide, and weather and climate as a consequence of participation.

Differences in these activity and skill areas among respondents distinguished by year since participation were generally insubstantial. Among organizations, more substantial impacts on various outdoor skills were noted by NOLS and, to a lesser degree, OB respondents (some examples are provided in Figure 2-21).

Figure 2-22 indicates perceived program influences on various conservation activities occurred more in the area of personal conduct than in what might be called conservation activism. Fifteen to 30% increases were noted in recycling, environmental reading, course instruction, and avoiding the use of certain products as a consequence of participation. Additionally, membership in at least one environmental organization increased from nearly 40 to 60% of respondents, and membership in two or more organizations nearly doubled. By contrast, more activist behaviors increased only slightly including writing letters, donating money, attending community meetings, working with citizen groups, volunteering on behalf of the environment, or using public transportation. Additionally, these changes were often significantly less pronounced among persons who participated six or more years ago in comparison to more recent participants.

Among organizations, SCA participants reported more significant program impacts on various conservation activities, including interest in community service, volunteering, and environmental education and careers (Figures 2-23, 24, & 25).

Personal and Character Development

Very pronounced and often dramatic impacts were observed in various aspects of personal and character development as a consequence of the program experience. Many respondents indicated major and sometimes profound transformations in self-image and future orientation prompted by challenge and coping in unfamiliar and unspoiled natural settings in the company of others.

Figure 2-26 reveals half or more of respondents reported major impacts on fourteen aspects of personal development. Sixty to 70% of respondents reported very positive program impacts on three elements of physical well being including health, stamina, and strength; as well as, four aspects of personal autonomy and security including self-reliance, independence, maturity, and self-confidence. Five factors rated as very influenced by a majority or more of participants emphasized personal contentment including comfort with being alone, happiness, self-esteem, self-respect, and peace of mind. Two features viewed by approximately a majority of respondents as very influenced by program participation stressed assertiveness and coping with uncertainty including risk-taking, initiative, and boldness (Figures 2-26 & 27). The least affected aspects of personal development – reported by 40% or less of respondents as very influenced by their program experience – were creativity, compassion, and decisiveness (Figure 2-27).

Respondents who participated during the previous two-year period were more likely to rate their experience as having had a strong influence on most aspects of personal development (Figure 2-28). Only negligible differences occurred among persons who participated 3-5 versus 6 or more years ago. Among organizations, few differences were noted in most aspects of personal development. When comparing SCA programs, fewer changes were noted among RA than HS and CCDP participants.

Perceived impacts were generally less pronounced on interpersonal skills and relationships. Figure 2-29 reveals that more than a quarter of respondents rated four aspects of interpersonal relationship as very influenced by program participation including awareness of group needs, receptivity to the ideas and opinions of others, ability to meet new people, and patience. Very substantial attrition in perceived impact was also noted, particularly when comparing persons who participated during the previous two year period with respondents whose programs were six or more years ago (Figure 2-30). Among organizations, NOLS and OB respondents generally reported significantly greater impacts on interpersonal skill development than did SCA participants, with the least effect occurring among SCA-RA participants.

Various problem-solving skills were viewed as highly influenced by program participation among a large fraction of respondents. A near majority or more of respondents reported their experience had very positively affected such problem resolving skills as seeing tasks through to completion, taking action, determining how to do a task, and resourcefulness (Figure 2-31). Additionally, more than forty percent of respondents viewed their programs as having substantially influenced several elements of coping behavior including making difficult decisions and remaining calm in an emergency. Figure 2-32 indicates more than a quarter of

respondents rated six additional problem-solving skills as very influenced by program participation. The top four emphasized analytical skills including choosing among alternatives, comparing and contrasting ideas, and identifying, understanding, and solving problems. The remaining two focused on working with others including accepting criticism and delegating tasks.

Declining impacts in most aspects of problem solving skill were suggested when comparing persons who participated six or more years ago with more recent participants (Figures 2-33 and 2-34). Among organizations, OB and NOLS participants generally reported greater program impacts on various problem-solving skills, especially in comparison to SCA-RA respondents (Figure 2-35).

A large fraction of participants indicated their wilderness experience had exerted considerable impacts on everyday life. Figure 2-36 reveals that 40% or more of respondents reported seven skill areas emphasized or fostered by program participation had proved useful in coping with daily life. The most frequently cited were interpersonal, leadership, group participation, and wilderness skills. Two additional areas viewed by more than 40% of respondents as highly applicable to everyday life included risk-taking and survival skills. Thirty to 40% of respondents rated three other areas as helpful in dealing with everyday life including decision-making, conflict-resolving, and problem-solving skills. These impacts were less evident among respondents whose programs were longer ago (Figure 2-37).

These findings provide additional clarification and confirmation of the possible character and personality development impacts of the outdoor experience. These statistics can obscure,

however, the more subtle effects that may occur. A more qualitative and often eloquent articulation of these impacts is provided by the following participant remarks.

After I came home, I was a completely different person. I had a sense of what I was able to accomplish and a sense of confidence in myself.

The most important aspect of the program was breaking through my own blocks, realizing I am much more capable than I previously thought. The question is no longer 'can I do this?' It is 'how can I do this?'

[The program] made me more confident, focused, and self-reliant. I have become more compassionate towards not only nature, but towards other people.

I learned about respect, setting goals, working to my maximum and past it. These are skills I consider to be important in everything I do, and I feel they will help me continue to be successful throughout my life.

I went on my trip at a turning point in my life. Not only did it help with my confidence and leadership and all of those wonderful and personal things but it also gave me an insight into the world in a broader sense. [It gave me] a greater understanding of life and my role in life.

The strength of the friendships and bonds that my group created were life changing. This strength was inextricably linked to the difficulty and nature of the work we were doing, and to the fact that we were living outdoors.

The most important part to me was being active and actually making a difference. Too much of life is wasted away behind a book. It felt really good to do something productive. Another aspect was the improved self image that such positive work and positive interactions gave me. Plus, there are the life long friendships!

Learning by doing. Learning that there is so much more than text books can ever say. Learning who you are and what life means to you.

Particularly important to me was the focus on self-betterment, team work, challenge and physical health. I feel that these aspects help build self-confidence, leadership, and create new limits. I became a much more self-sufficient, eager and open-minded person because of the experience – not to mention I felt physically well, healthy, and strong.

It helped me to define a philosophy of life and affected my career decisions.

It's important for inner city youth to leave the city and feel the environment around them and to see what it is like. It gives one a sense of freedom and a feeling of being able to make it through anything.

Getting us out into the real world, showing us what exists outside of TV, neon lights, suburbs, cement, and noise. Creating a genuine sense of community where each person is important for the survival of the whole – cooperation to exist, finding value in self and others, loving what is finally revealed – hacking labor, laughter in valleys and baths in glacier waters.

Conclusion

A number of general patterns emerged from the findings that deserve special note. Perhaps the single most significant result was the perceived overall impact of the wilderness experience. An extraordinarily large proportion of respondents cited this relatively short on average 3-4 week experience as among the most worthwhile and influential occurrences in their life. Perhaps this is an exaggeration, unduly appreciative of the impacts on a person's life of such profound events as child rearing, school, myriad family and interpersonal relationships, etc. Still, the respondents believed and reported in strong and convincing statistical and qualitative terms their view of the importance of the wilderness experience. In an increasingly human dominated, technologically oriented, and urbanized world, perhaps there remains something fundamental and necessary about the opportunity for immersion and challenge in relatively unspoiled and pristine nature. In the final chapter, we will devote more attention to this issue of causality and significance of the outdoors experience. For now, we wish to reiterate that a large proportion of respondents viewed their programs as one of the most important and influential experiences in their life, often many years after its occurrence.

We encountered many elements of increase in environmental skill, interest, and activity as a consequence of participation, as well as overall appreciation, understanding, and concern for protecting the natural environment. Additionally, a large proportion of respondents reported considerable improvement in various attributes of personal development, problem-solving ability, interpersonal relationship, and applicability of program emphasized skills to everyday life. In general, most participants emerged from their wilderness experience more optimistic, confident, self-reliant, capable, and equipped for pursuing lives of meaning and satisfaction.

On the other hand, far more restricted impacts occurred in various aspects of factual environmental knowledge, conservation activity, and interpersonal relationship. Moreover, we often encountered diminishing effects over time in many areas of environmental knowledge, awareness, and personal and character development.

Among organizations, similarities were generally more impressive than differences. Still, the greatest overall impact was reported by SCA-HS and NOLS participants. Outward Bound and SCA-CCDP participants often reported less pronounced program effects, while SCA-RA respondents indicated the fewest changes in personal and character development. SCA participants generally reported the greatest impacts on environmental interest and conservation activity, as well as career choice and commitment to public service. NOLS participants were more likely to emphasize impacts on personal and interpersonal development, while OB respondents sometimes reported the greatest effect on aspects of problem-solving ability. These differences frequently reflected varying organizational emphases and philosophies.

Methodological limitations of the retrospective research restrict our ability to confidently generalize from the results. The most significant deficiency was the relatively poor response rate

in the mail survey. In addition, problems exist in the quality of recall data, especially many years following an experience.

These methodological concerns underscore the importance of the longitudinal study. In contrast to the retrospective research, the longitudinal study obtained data from nearly all participants immediately before and following the programs. In addition, this study compared the responses of persons not only before and immediately following the experience but six months later as well. On the other hand, limitations of longitudinal research include a smaller and less diverse sample, and difficulty in exploring impacts many years after an experience. The longitudinal research, thus, represents an important complement to the retrospective findings reported in this chapter.

FIGURE 2-1

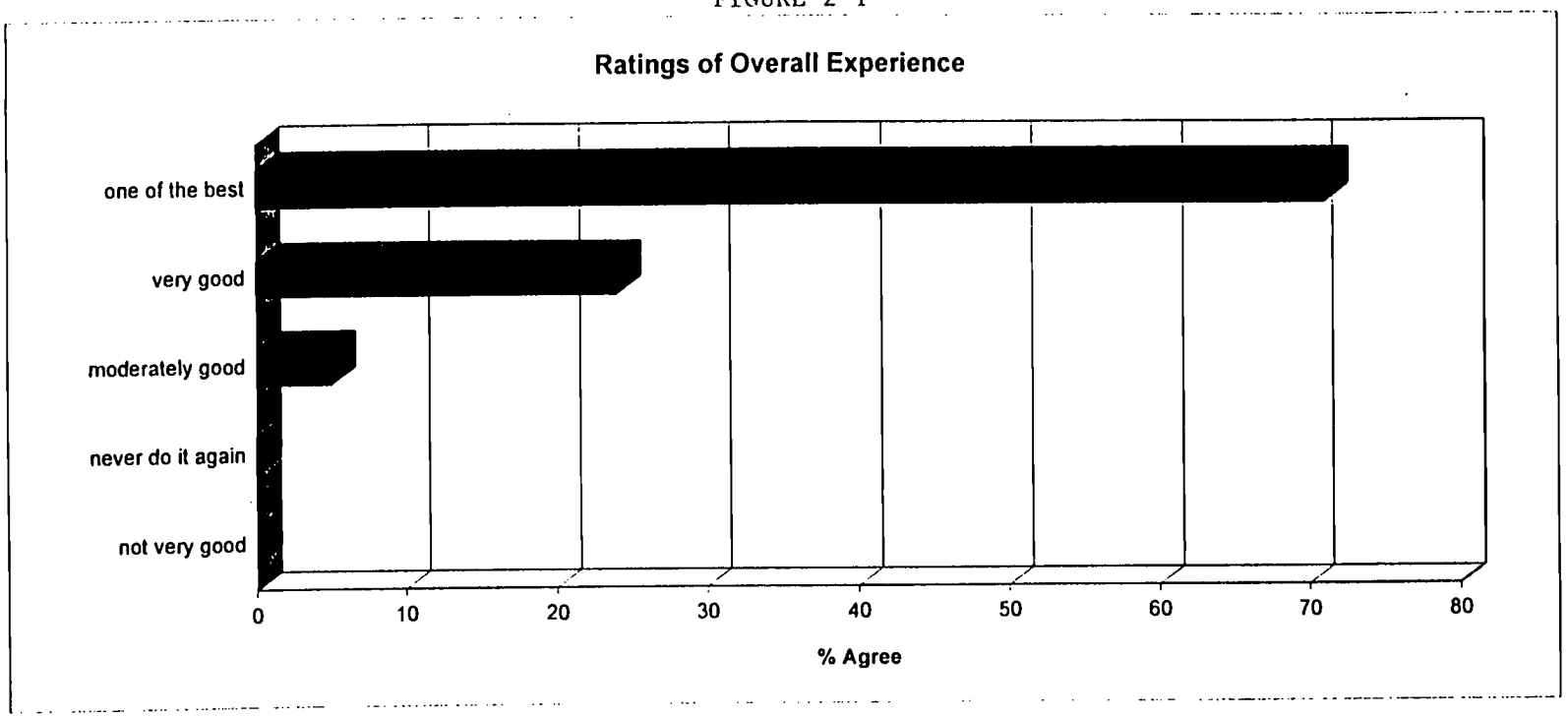

Ratings of Overall Experience
one of the best
very good
moderately good
never do it again
not very good
0
10
20
30
40
50
60
70
80
% Agree

FIGURE 2-2

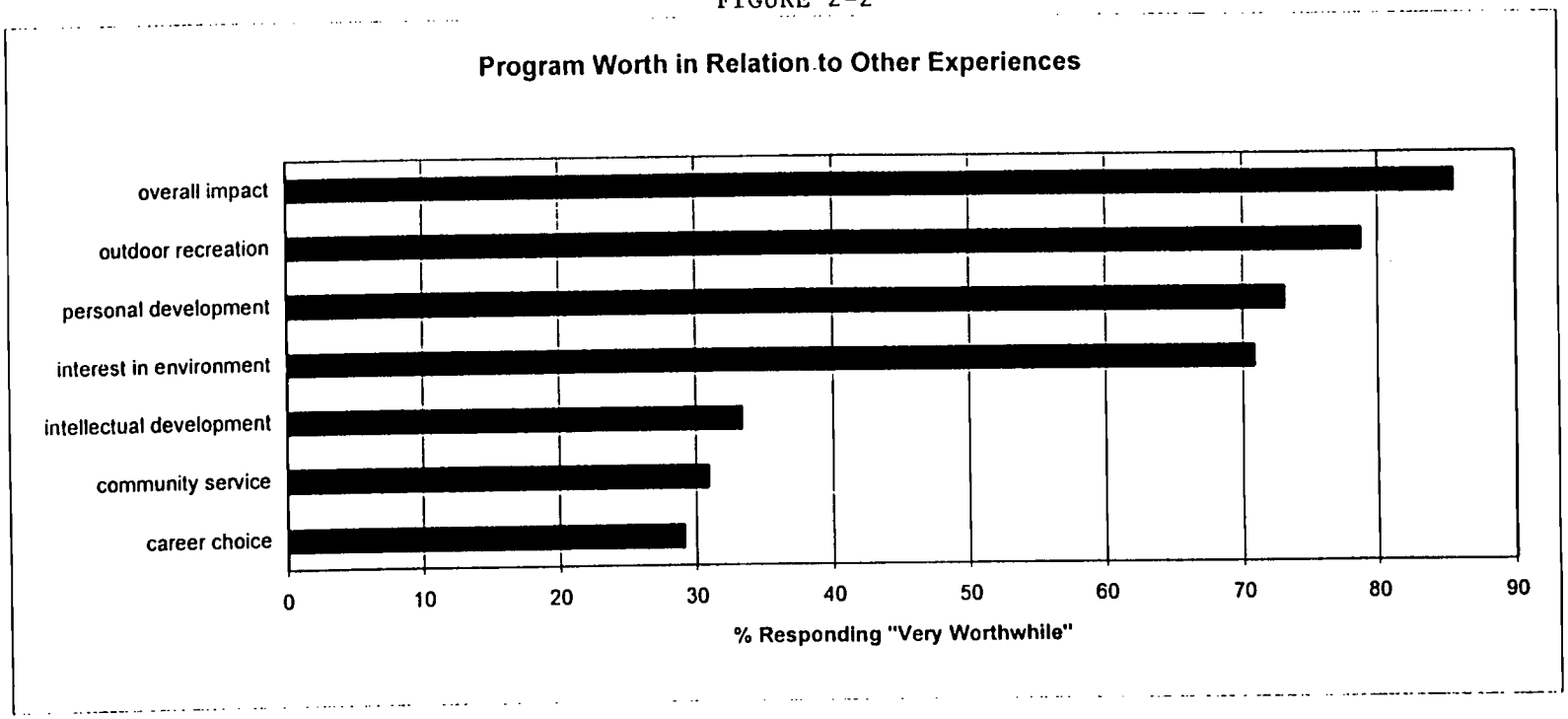

Program Worth in Relation to Other Experiences
overall impact
outdoor recreation
personal development
interest in environment
intellectual development
community service
career choice
0
10
20
30
40
50
60
70
80
90
% Responding "Very Worthwhile"

FIGURE 2-3

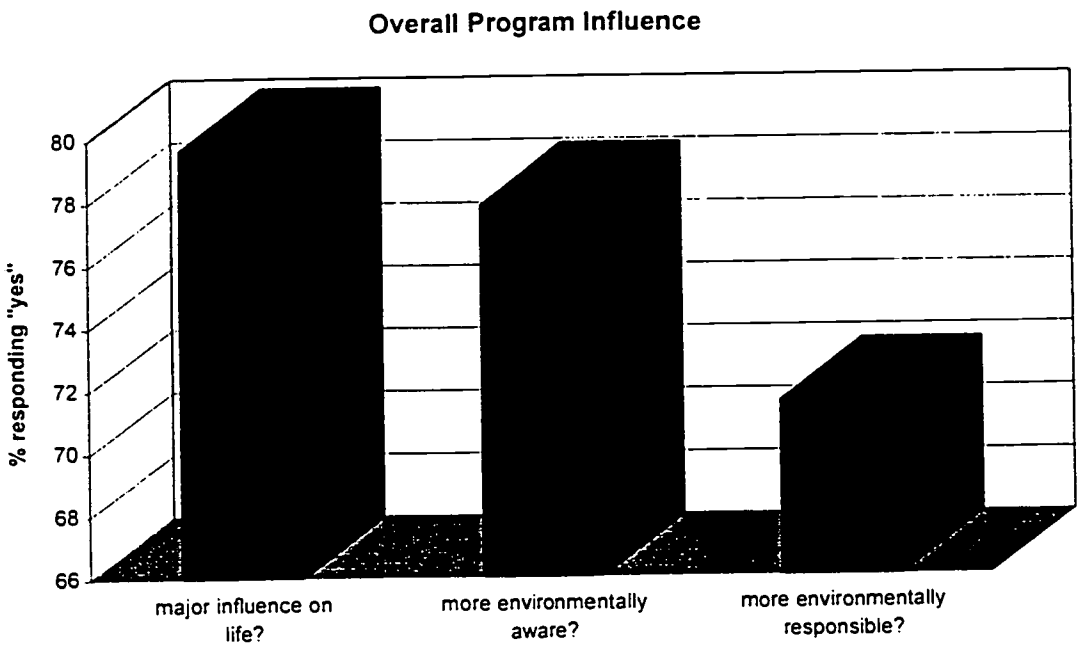

Overall Program Influence
% responding "yes"
80
78
76
74
72
70
68
66
major influence on life?
more environmentally aware?
more environmentally responsible?

FIGURE 2-4

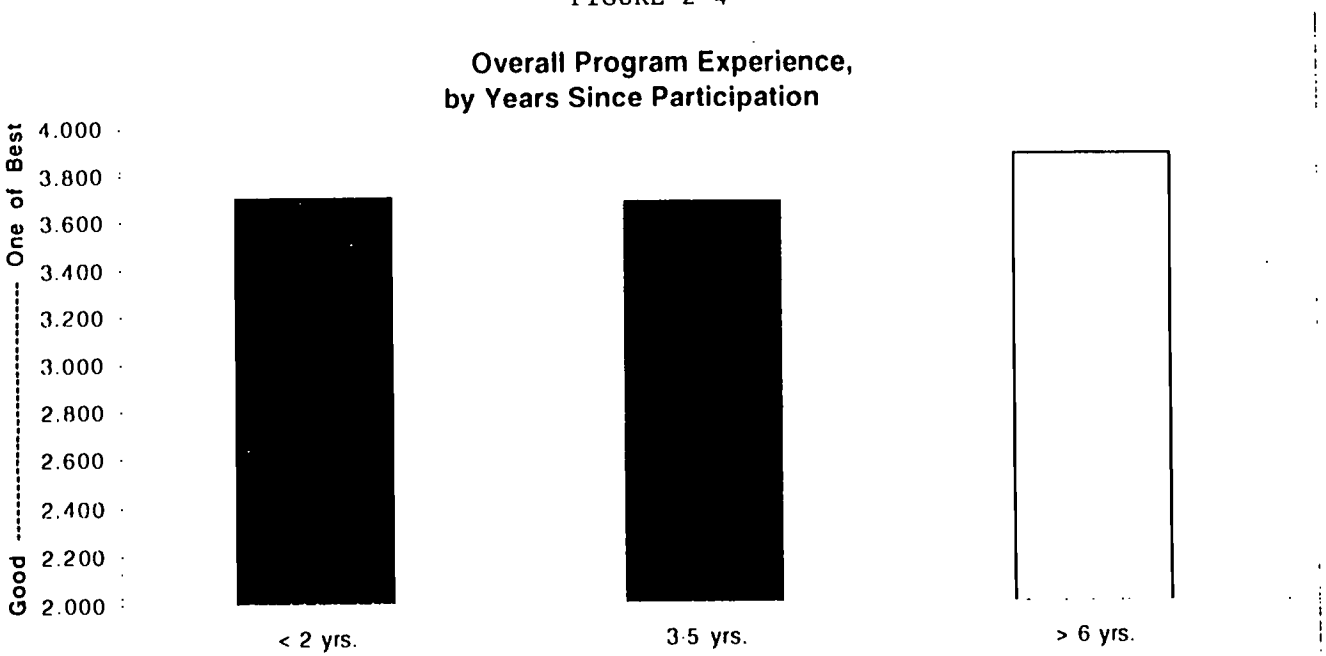

Overall Program Experience,
by Years Since Participation
Good ---------- One of Best
4.000
3.800
3.600
3.400
3.200
3.000
2.800
2.600
2.400
2.200
2.000
< 2 yrs.
3-5 yrs.
> 6 yrs.

FIGURE 2-5

Rating of Overall Experience

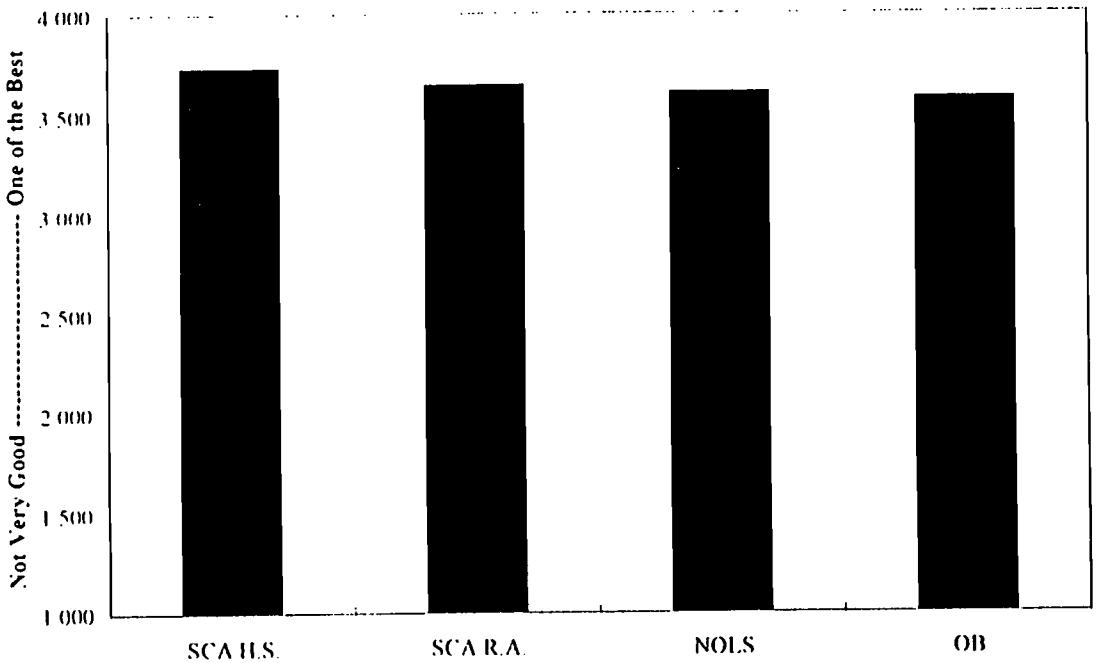


FIGURE 2-6

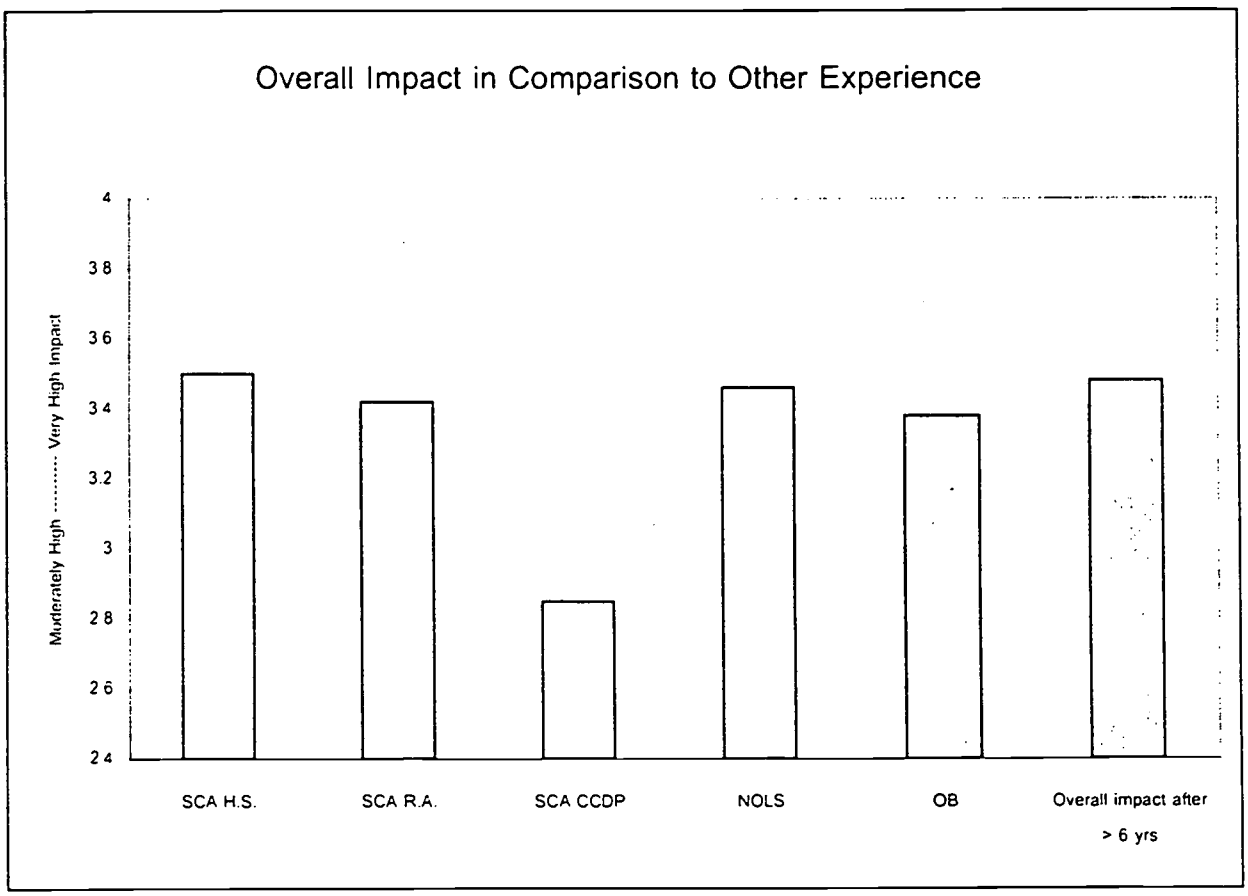


FIGURE 2-7

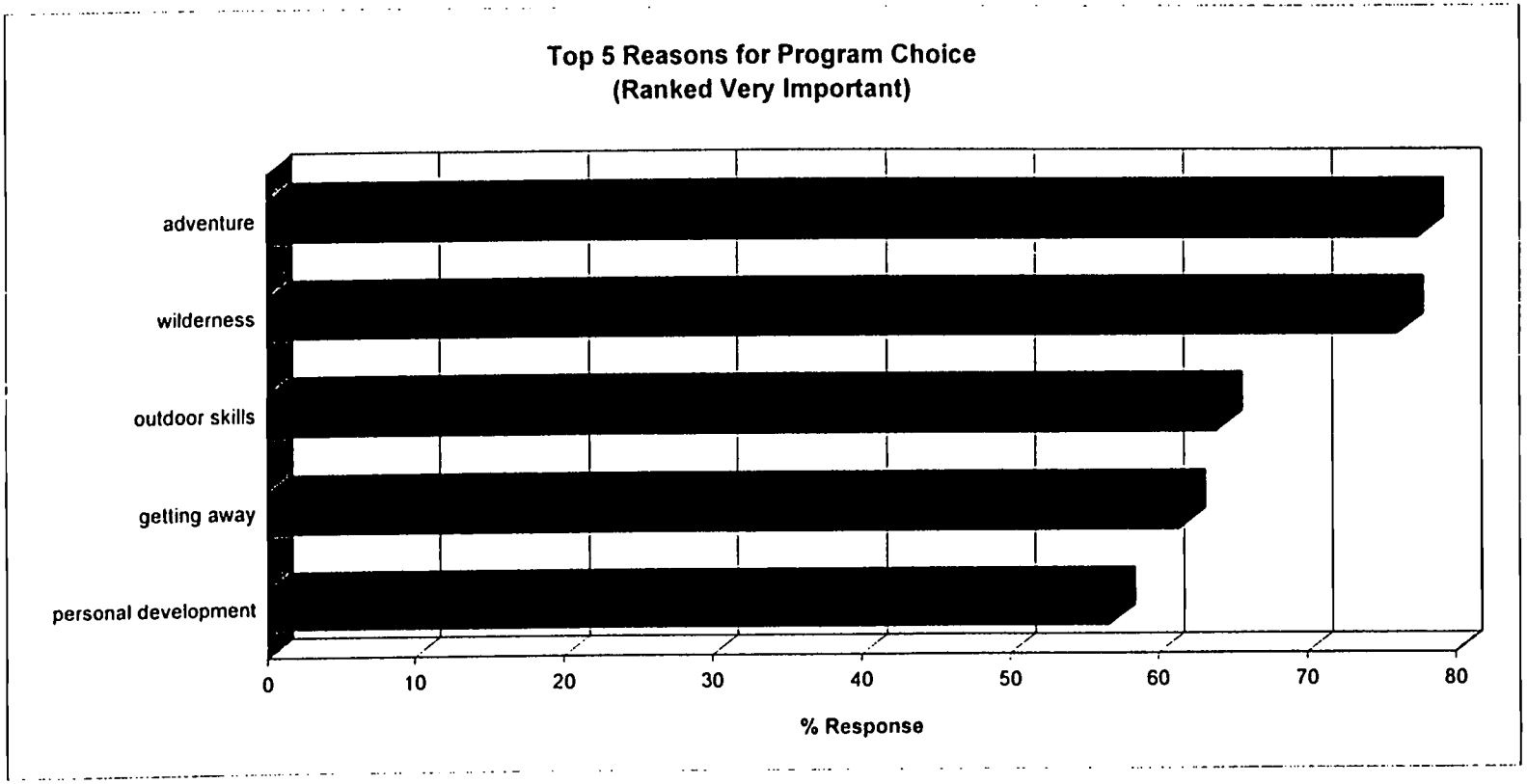

Top 5 Reasons for Program Choice
(Ranked Very Important)
adventure
wilderness
outdoor skills
getting away
personal development
0
10
20
30
40
50
60
70
80
% Response

FIGURE 2-8

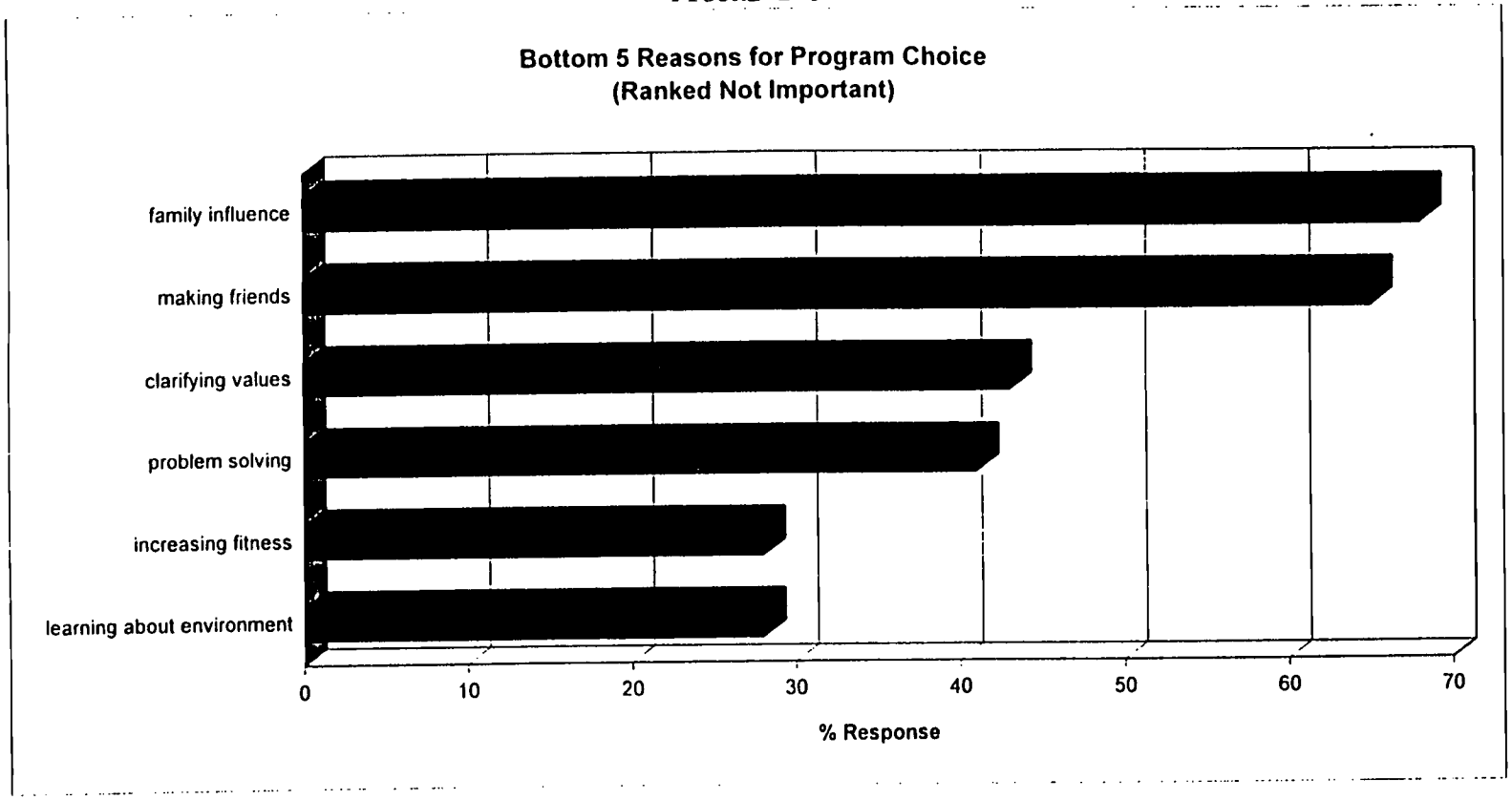

Bottom 5 Reasons for Program Choice
(Ranked Not Important)
family influence
making friends
clarifying values
problem solving
increasing fitness
learning about environment
0
10
20
30
40
50
60
70
% Response

FIGURE 2-9

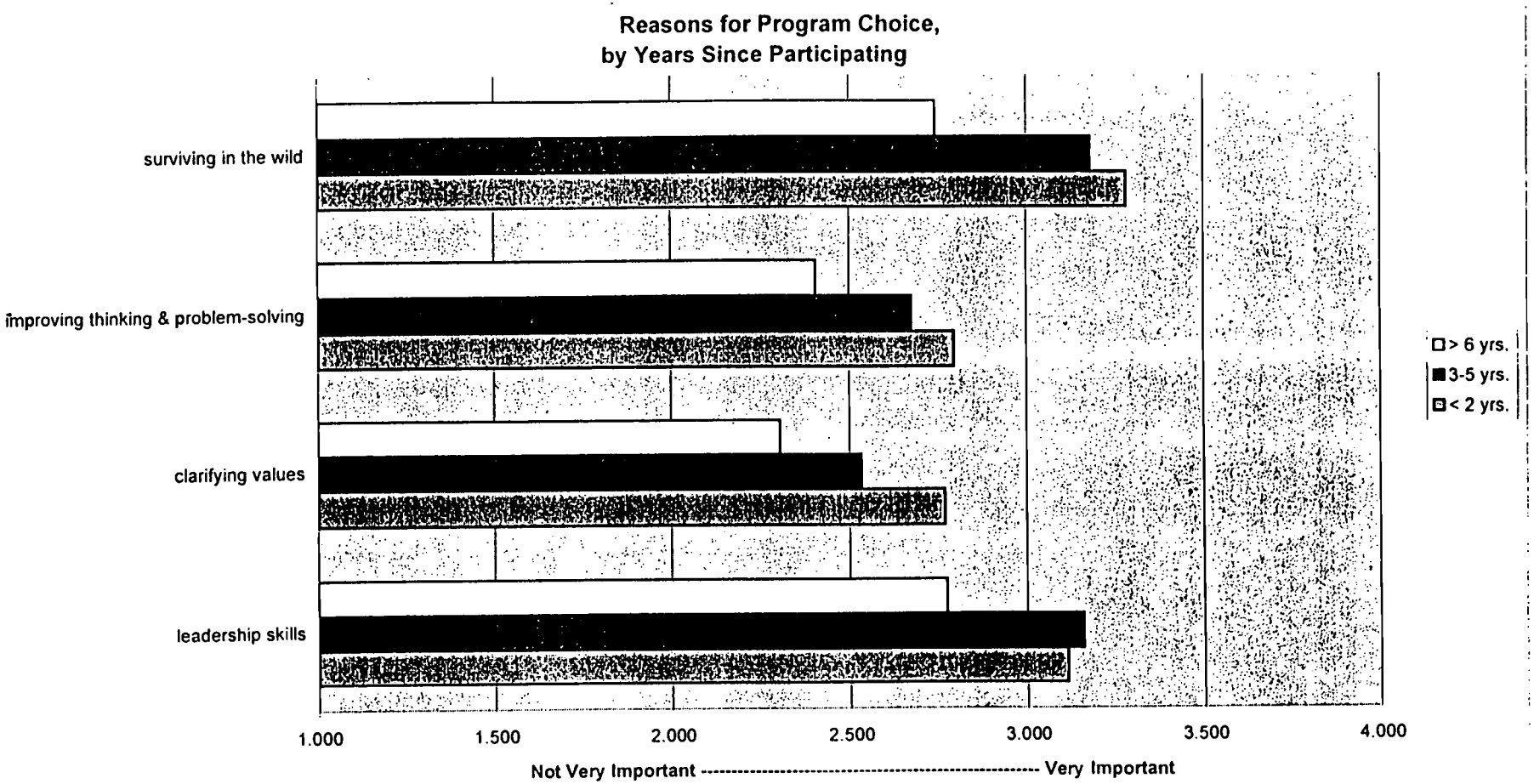


FIGURE 2-10

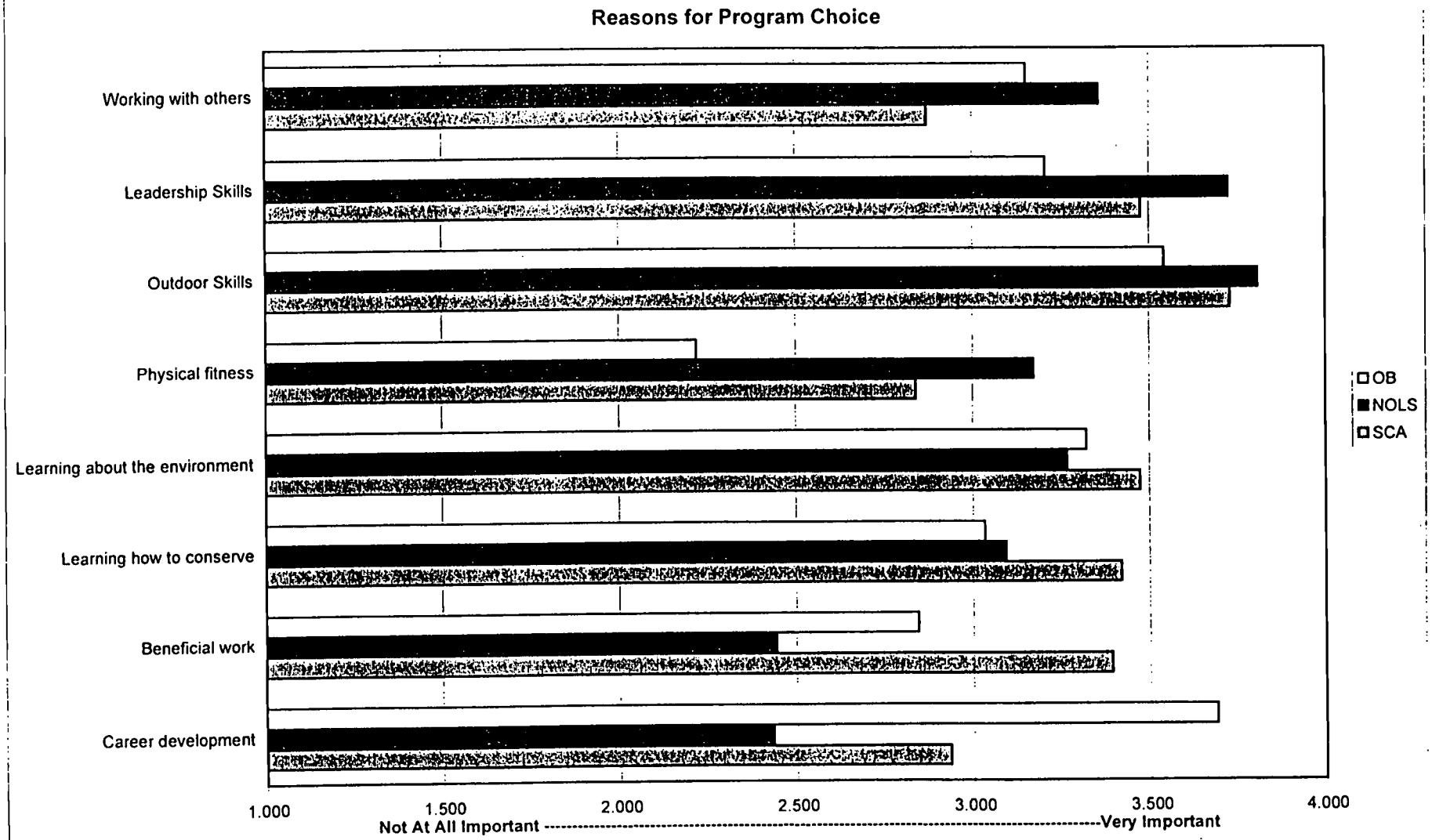
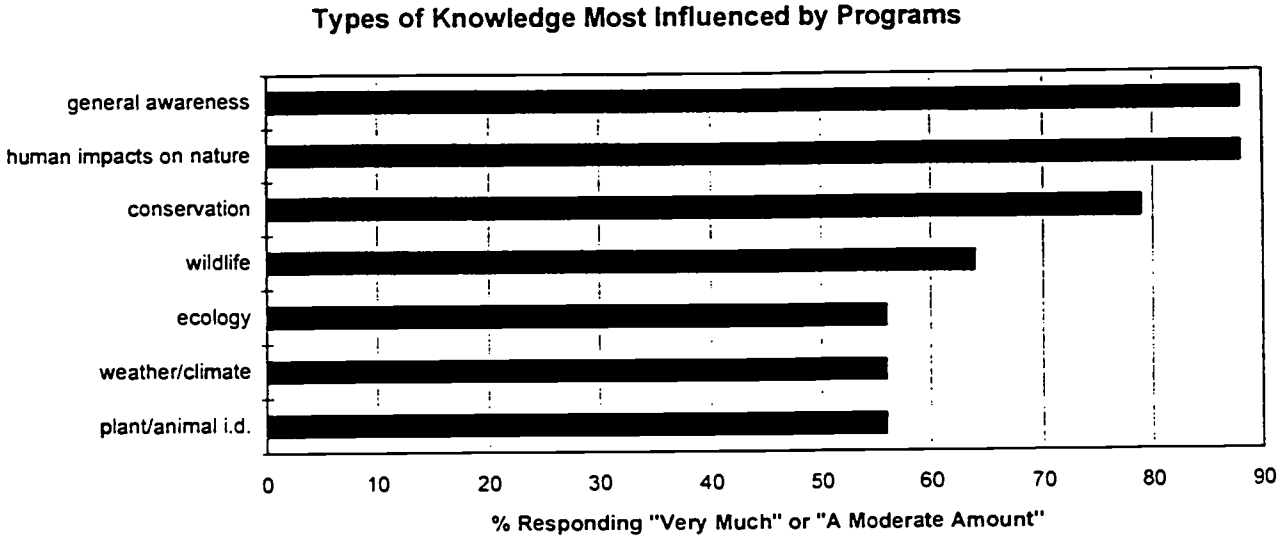


FIGURE 2-11


Types of Knowledge Most Influenced by Programs
general awareness
human impacts on nature
conservation
wildlife
ecology
weather/climate
plant/animal i.d.
0
10
20
30
40
50
60
70
80
90
% Responding "Very Much" or "A Moderate Amount"

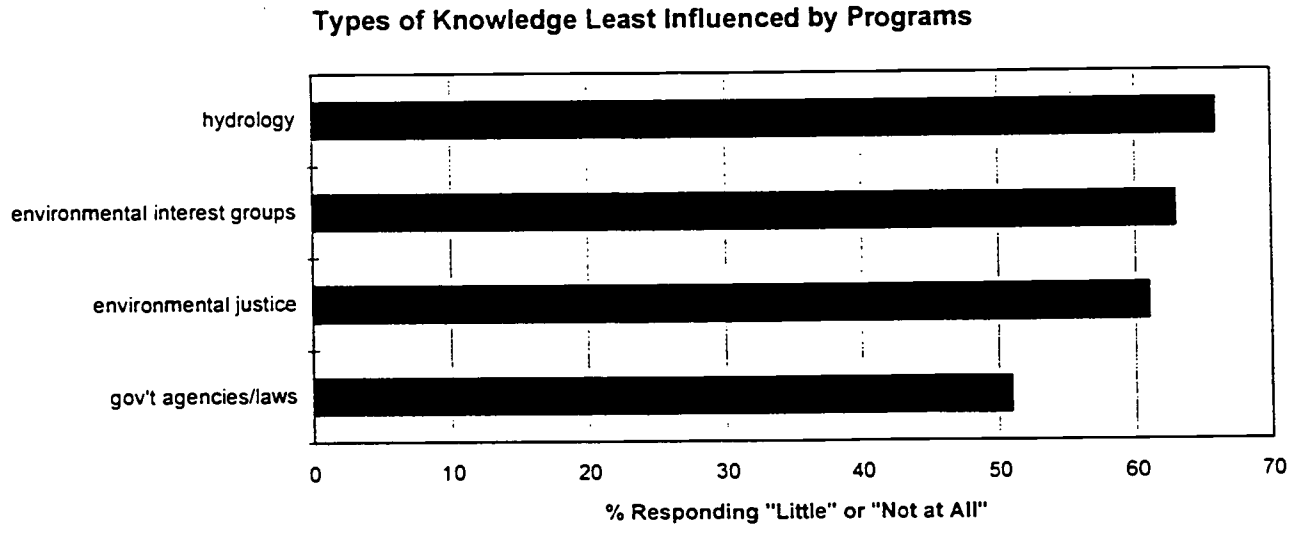

Types of Knowledge Least Influenced by Programs
hydrology
environmental interest groups
environmental justice
gov't agencies/laws
0
10
20
30
40
50
60
70
% Responding "Little" or "Not at All"

FIGURE 2-12

Program Influence on Knowledge, By Years Since Participation

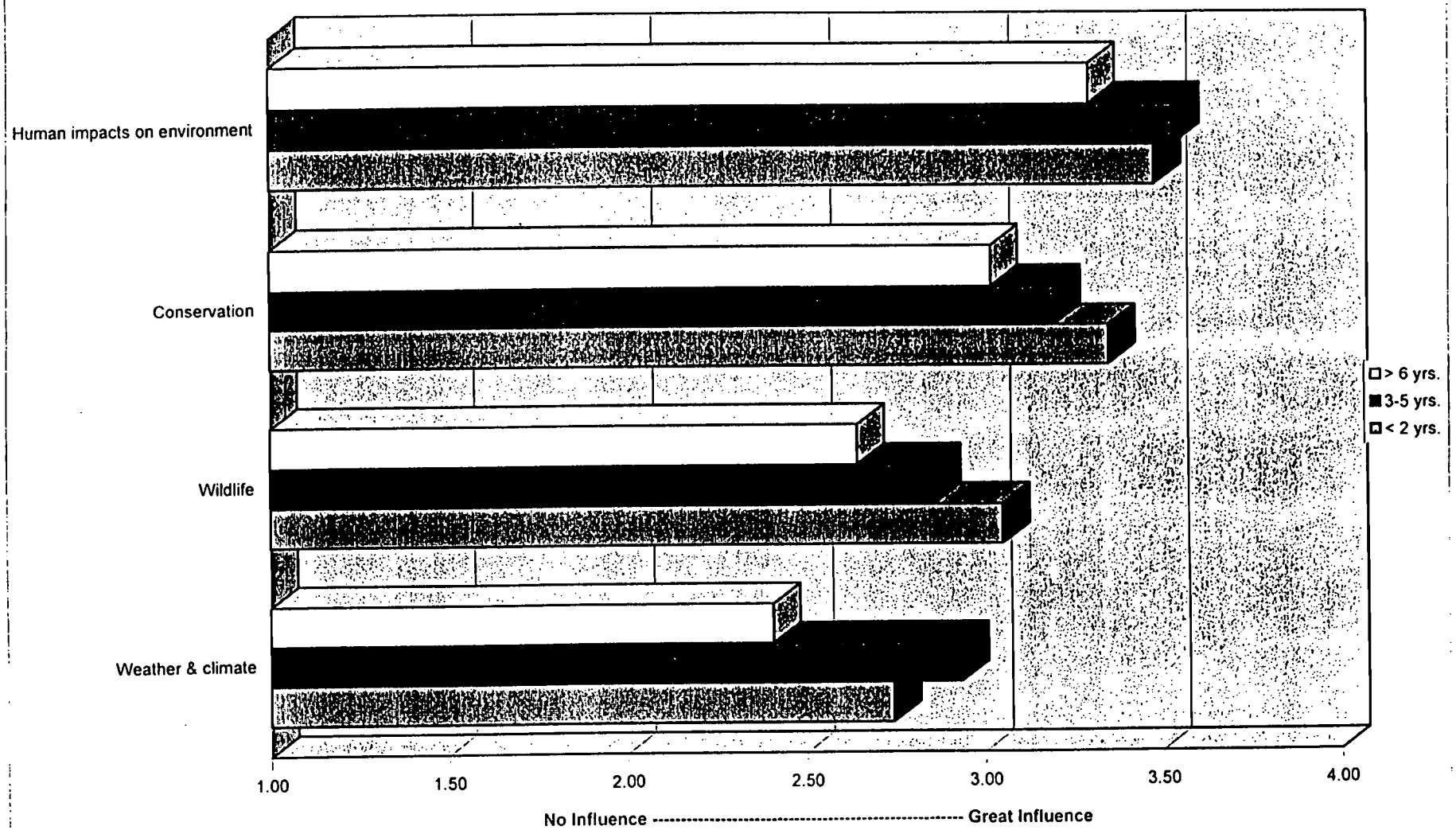


FIGURE 2-13

Program Influence on Regard for Environmental Problems

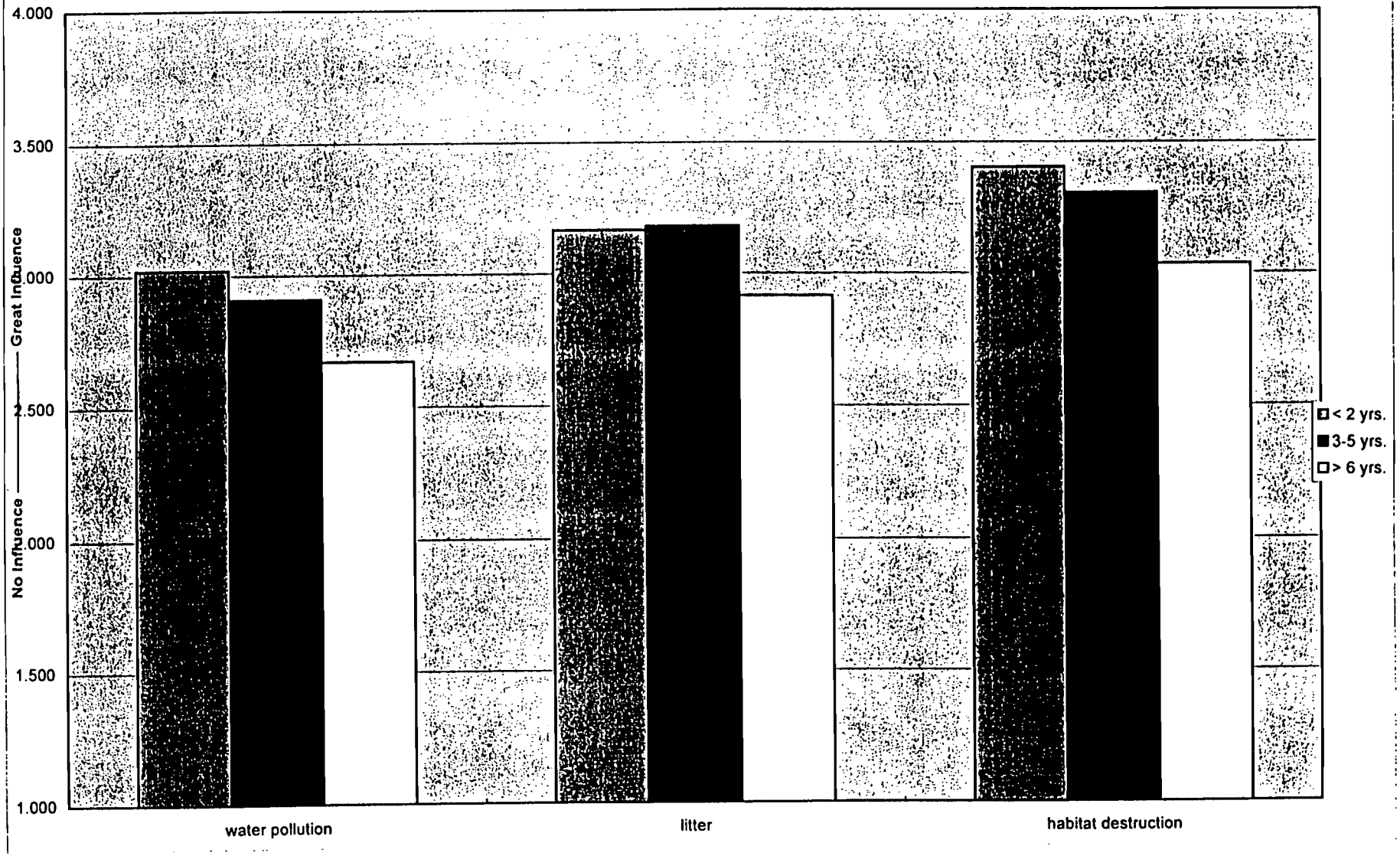


FIGURE 2-14

Program Influence on Understanding of the Natural Environment

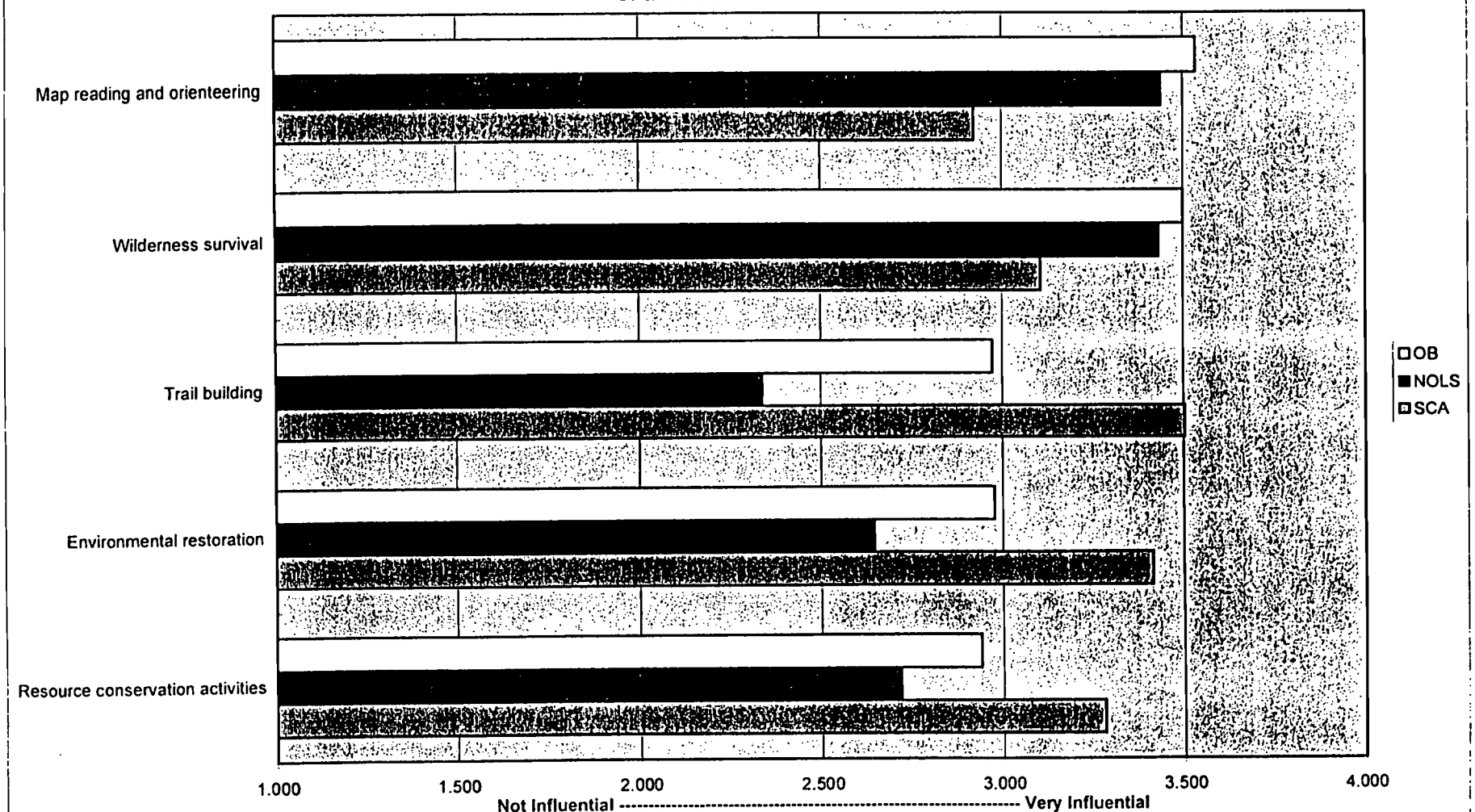


FIGURE 2-15

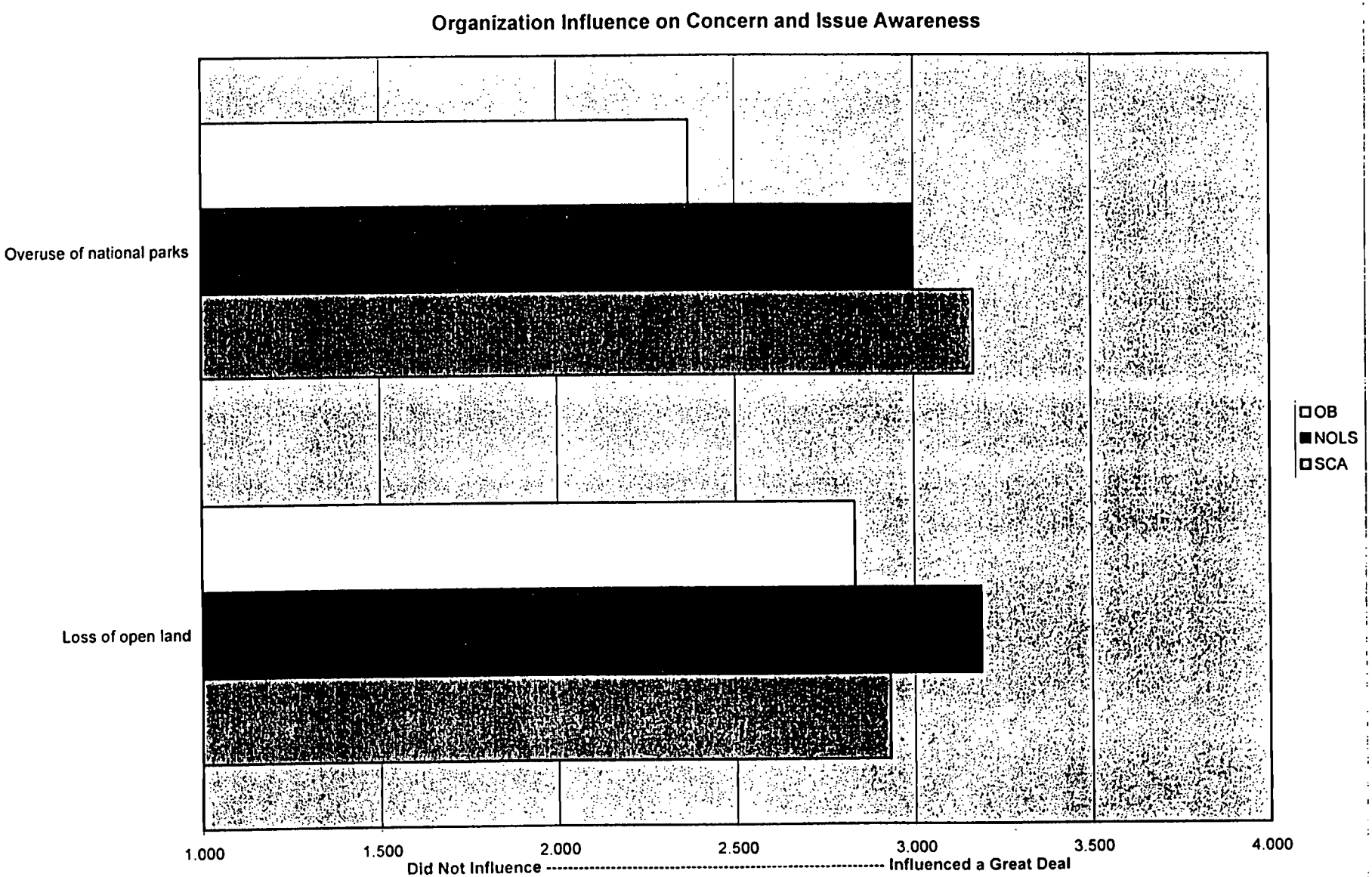


FIGURE 2-16

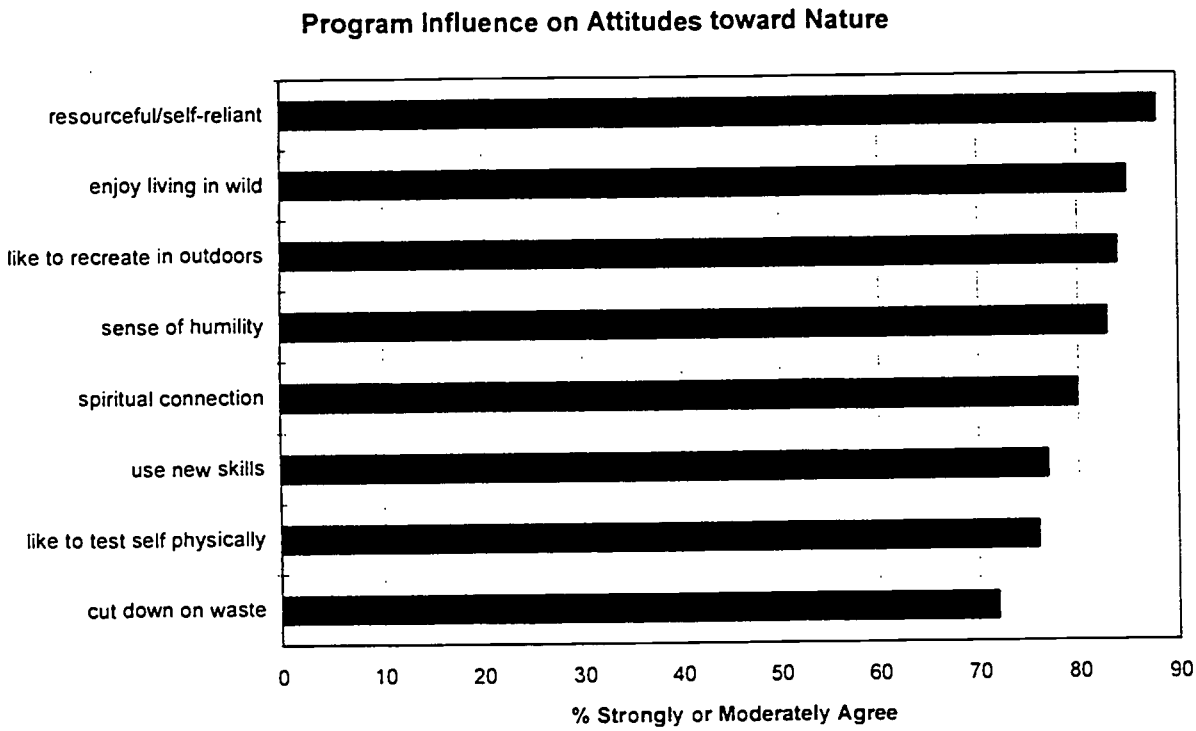

Program Influence on Attitudes toward Nature
resourceful/self-reliant
enjoy living in wild
like to recreate in outdoors
sense of humility
spiritual connection
use new skills
like to test self physically
cut down on waste
0
10
20
30
40
50
60
70
80
90
% Strongly or Moderately Agree

FIGURE 2-17

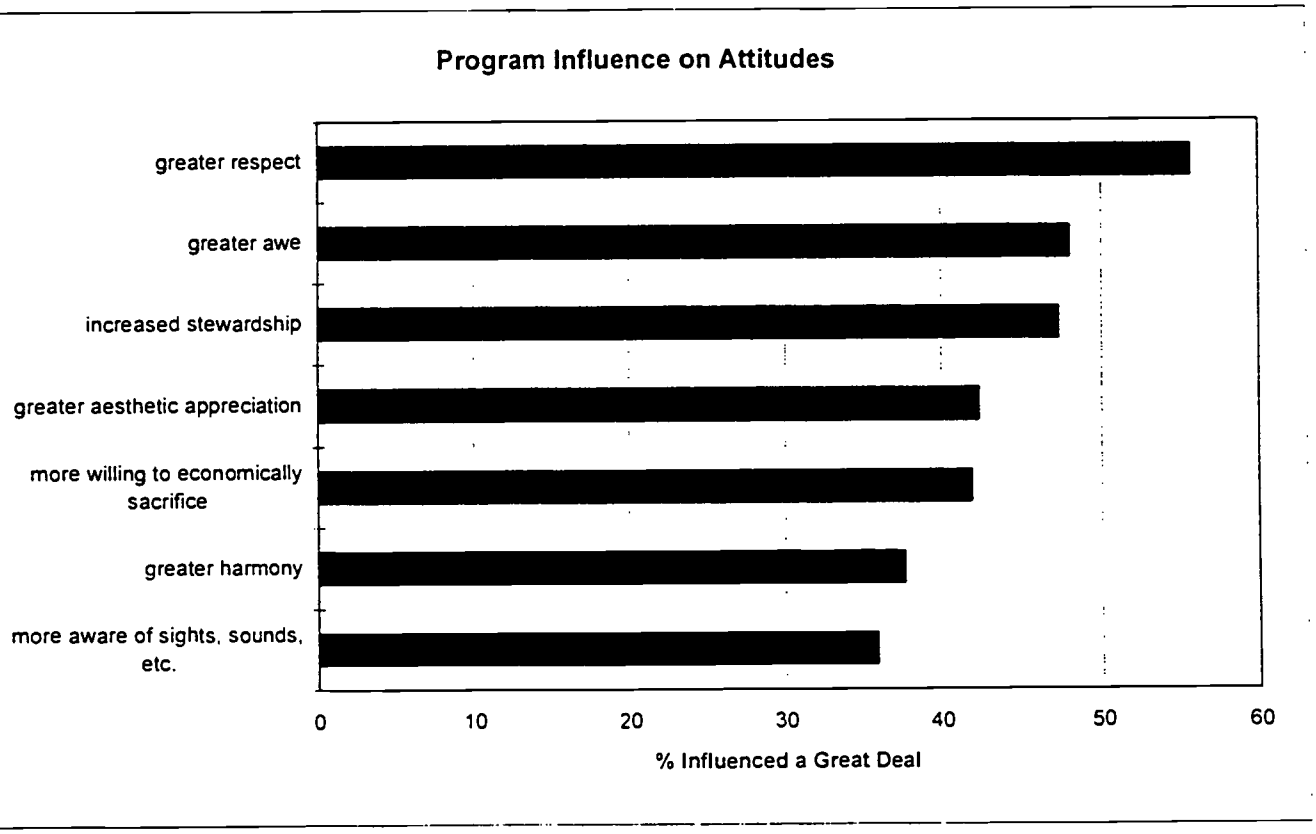

Program Influence on Attitudes
greater respect
greater awe
increased stewardship
greater aesthetic appreciation
more willing to economically sacrifice
greater harmony
more aware of sights, sounds, etc.
0
10
20
30
40
50
60
% Influenced a Great Deal

FIGURE 2-18

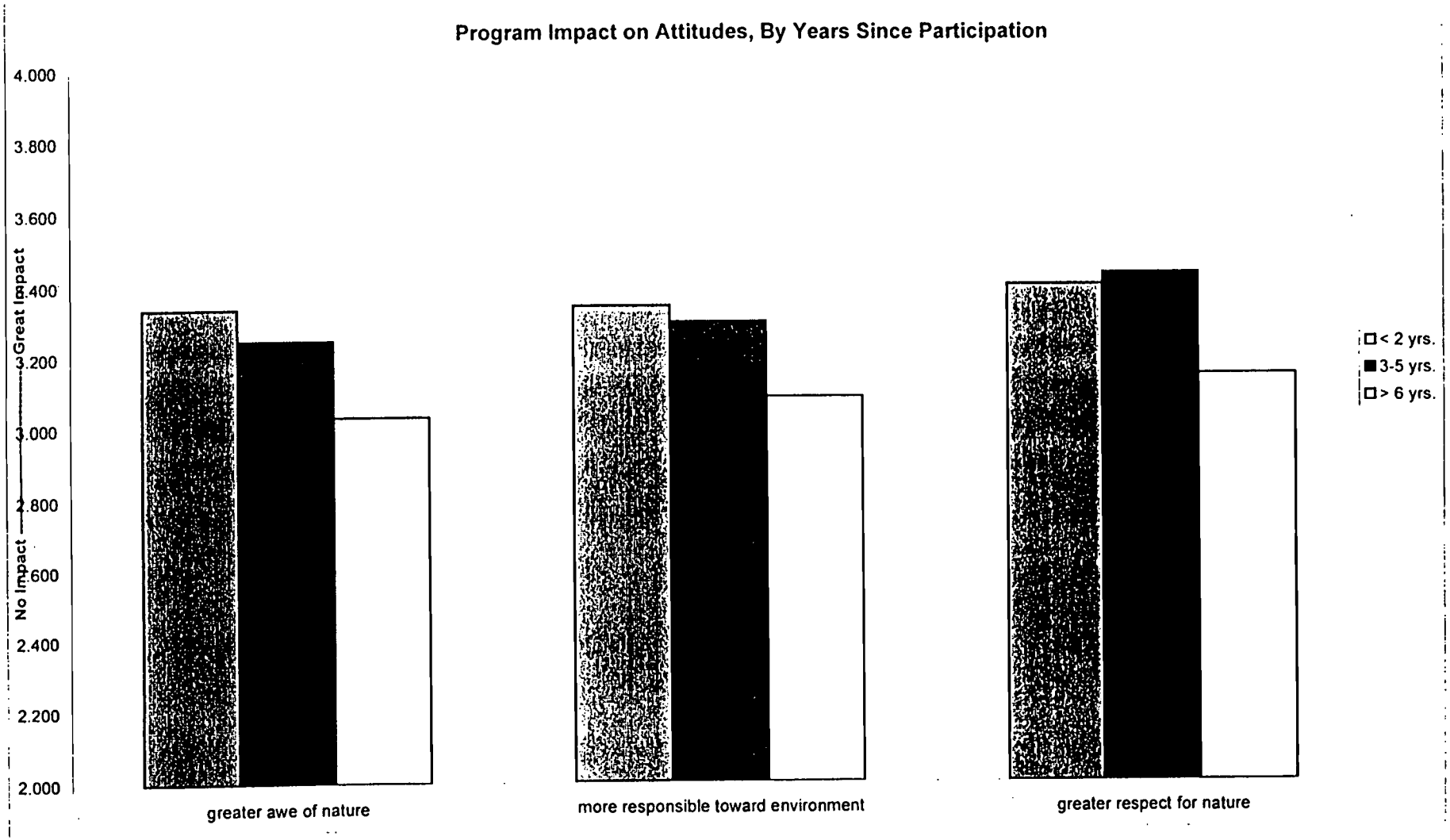

Program Impact on Attitudes, By Years Since Participation
4.000
3.800
3.600
3.400
3.200
3.000
2.800
2.600
2.400
2.200
2.000
Great Impact
No Impact
< 2 yrs.
3-5 yrs.
> 6 yrs.
greater awe of nature
more responsible toward environment
greater respect for nature

FIGURE 2-19

Program Impacts on Attitudes, by Years Since Participation

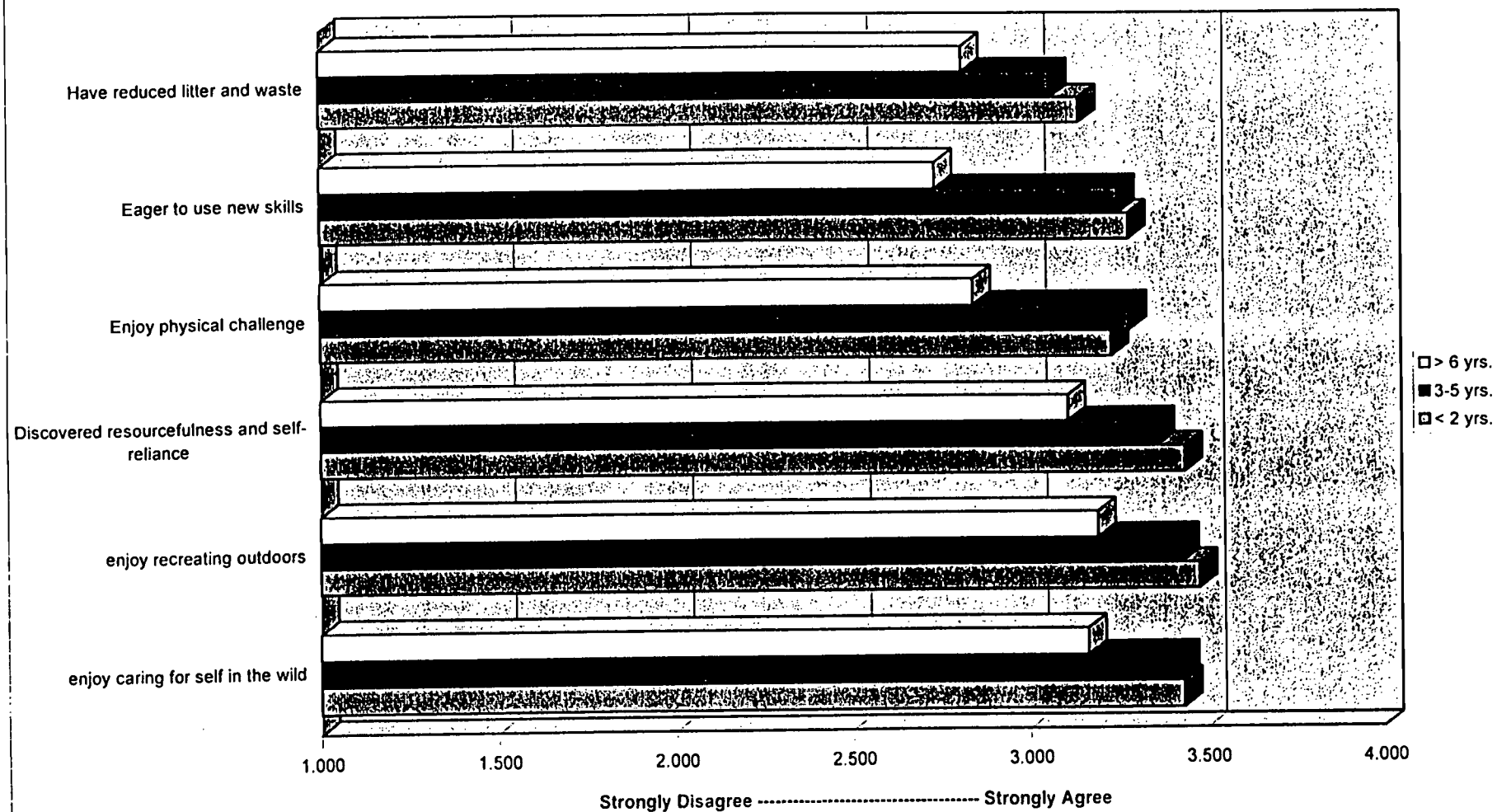


FIGURE 2-20

Most Frequent Outdoor Activities Before & After Program Participation

	Before (%)	After (%)	% Change
backpacking/camping	53	72	19
scientific study	25	42	17
rock/mountain climbing	22	38	16
hiking	62	75	13
photography/art	29	37	8
canoeing/kayaking/rafting	29	34	5

Least Frequent Outdoor Activities Before & After Participation

	Before (%)	After (%)	% Change
hunting	12	13	1
fishing	45	39	-6
skiing	35	37	2

Highly Rated Outdoor Skills Before & After Program Experience

	Before (%)	After (%)	% Increase
minimum impact camping	35	92	57
map/trail reading	30	83	53
wilderness camping	41	93	52
human impact i.d.	35	86	51
first aid/emergency	23	64	41
weather/climate	22	63	41
tying ropes/knots	21	57	36
plant/animal i.d.	14	48	34
rock, geology i.d.	16	50	34
building fires	46	74	28

FIGURE 2-21

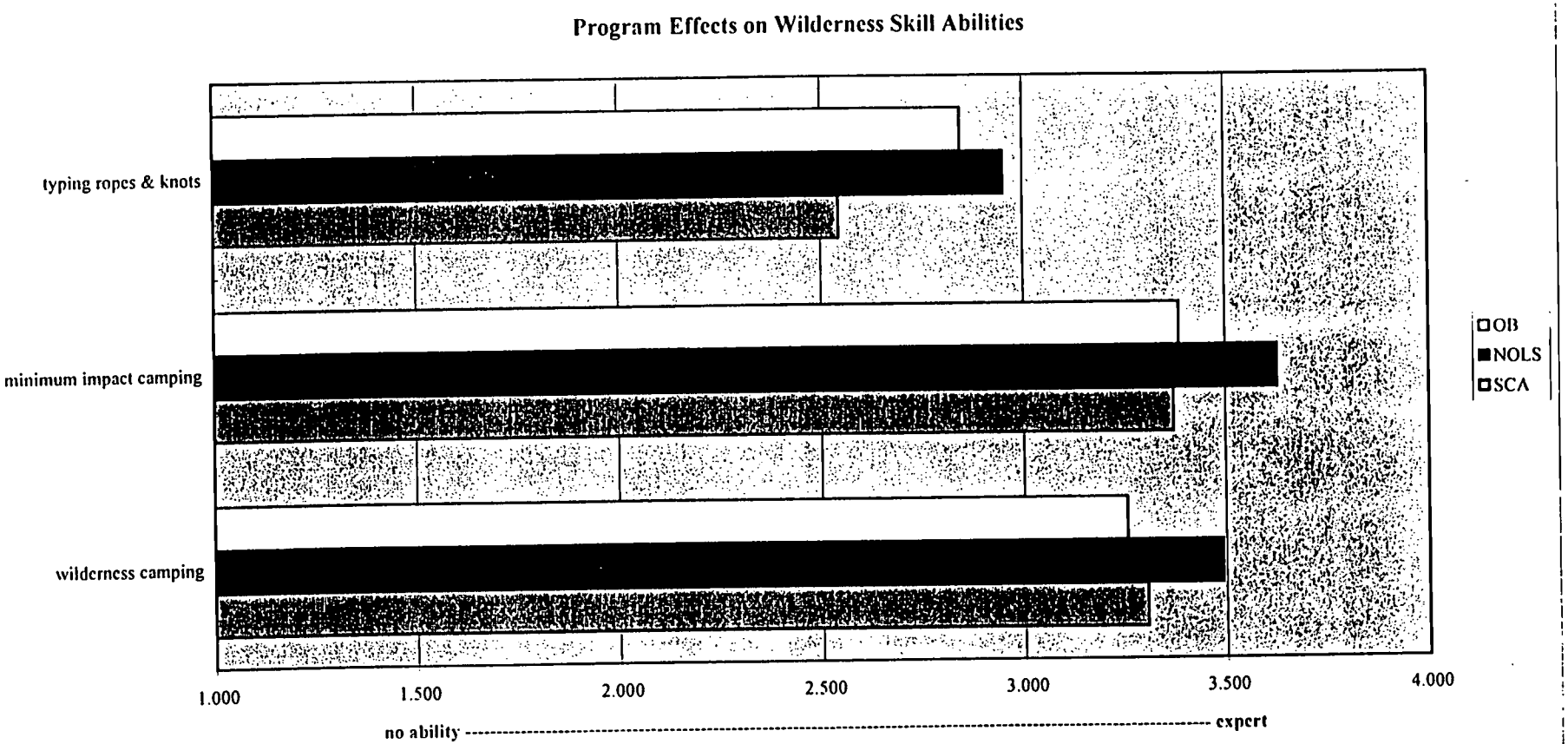

Program Effects on Wilderness Skill Abilities
typing ropes & knots
minimum impact camping
wilderness camping
OB
NOLS
SCA
1.000
1.500
2.000
2.500
3.000
3.500
4.000
no ability
expert

FIGURE 2-22

Most Frequent Environmental Behaviors Before & After Program	Before (%)	After (%)	% Change
recycling at home	45	74	29
reading about the environment	28	42	14
avoiding certain products	19	39	20
taking courses	19	34	15
volunteering	9	17	8

Least Frequent Environmental Behaviors Before & After Program	Before (%)	After (%)	% Change
writing letters	22	25	3
donating money	19	25	6
attending community meetings	18	24	6
working with citizen groups	20	22	2
volunteering	15	22	7
using public transport	16	21	5

Membership in Environmental Organizations

Before & After Program Experience

FIGURE 2-23

Program Impact on Career Choice and Interest in Community Service

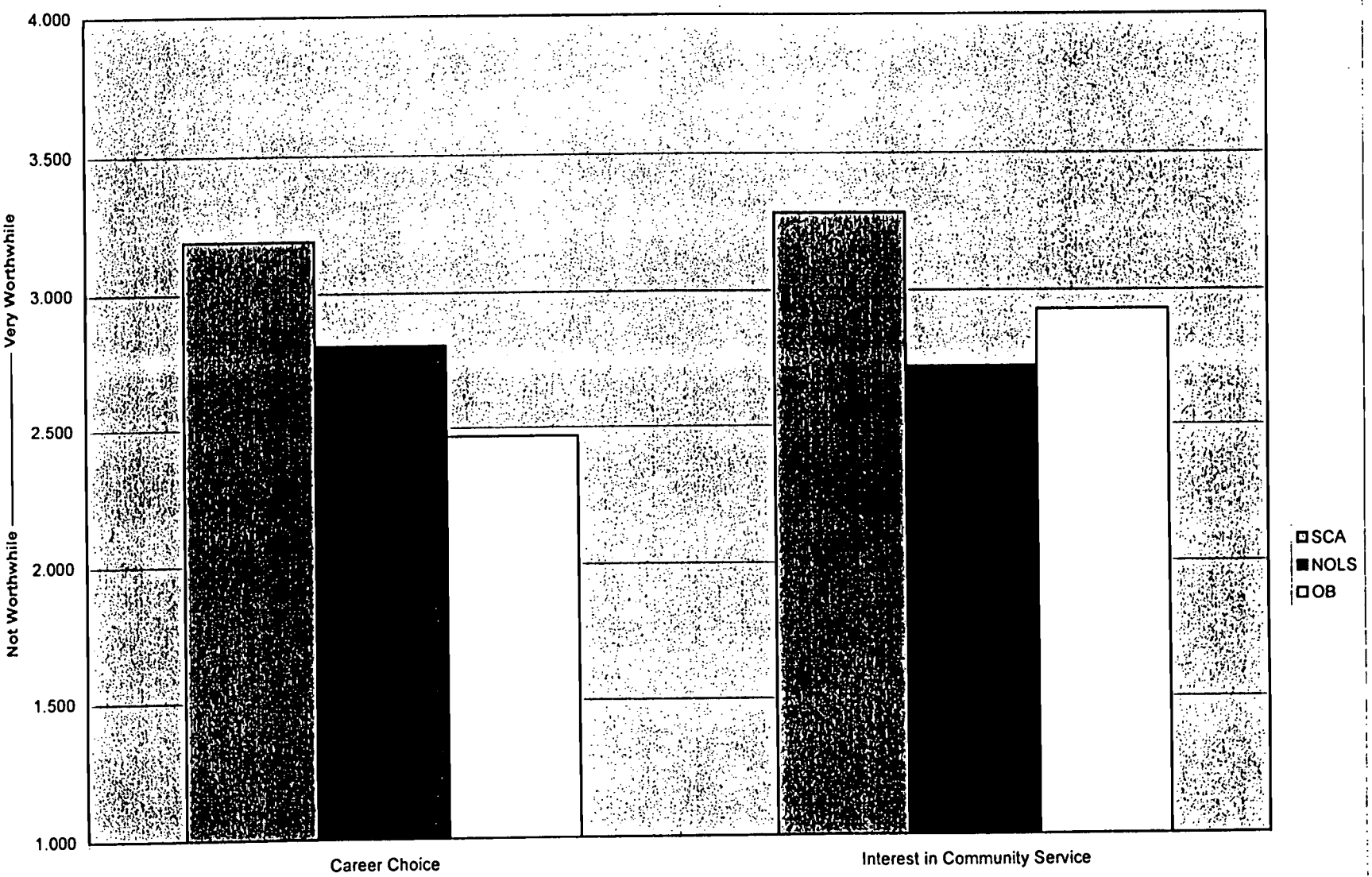


FIGURE 2-24

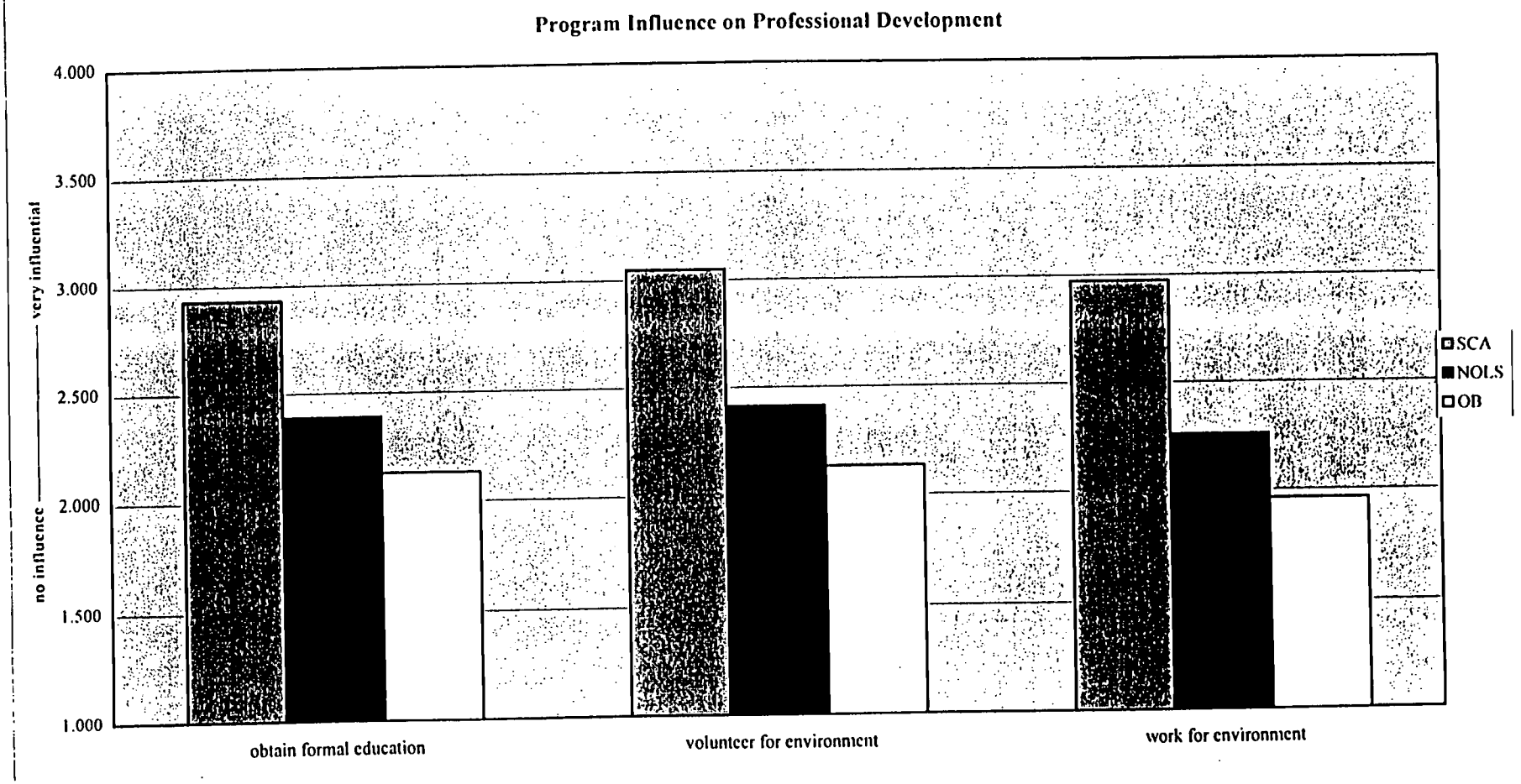

Program Influence on Professional Development
4.000
3.500
3.000
2.500
2.000
1.500
1.000
no influence ——— very influential
obtain formal education
volunteer for environment
work for environment
SCA
NOLS
OB

FIGURE 2-25

Program Impact on School Interests in Environment

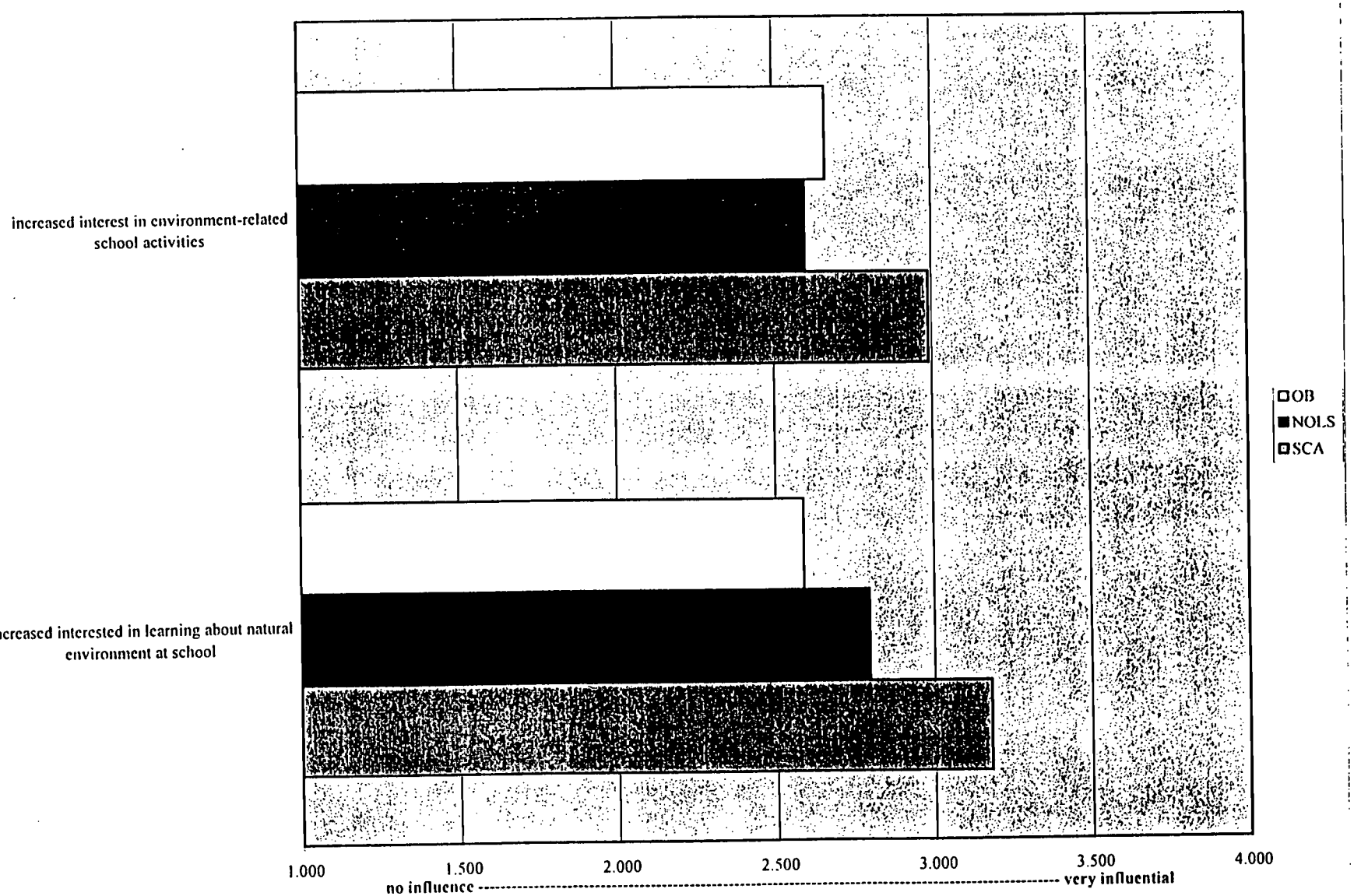


FIGURE 2-26

Aspects of Personal Development Perceived to be Very Positively Influenced by Programs

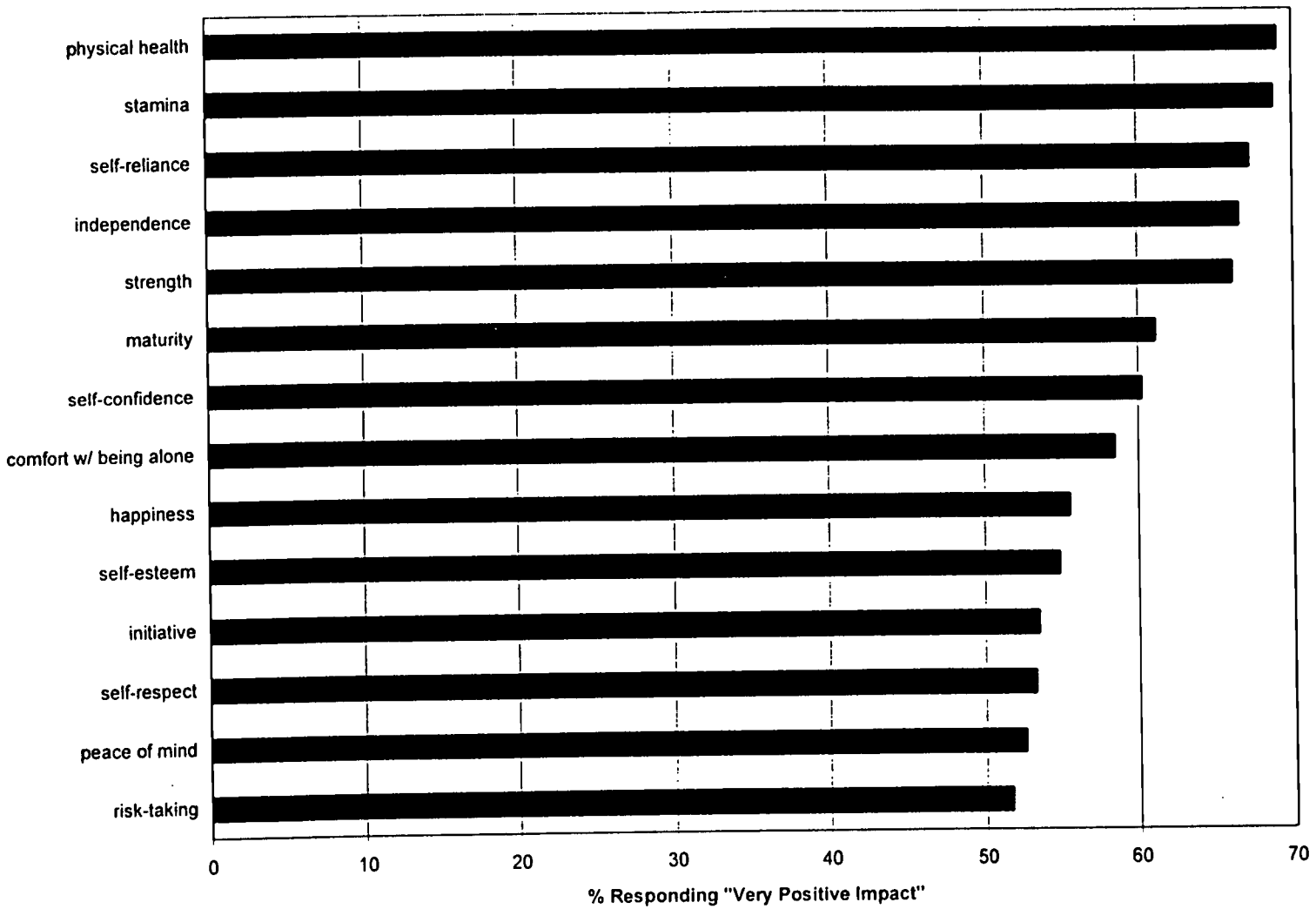


FIGURE 2-27

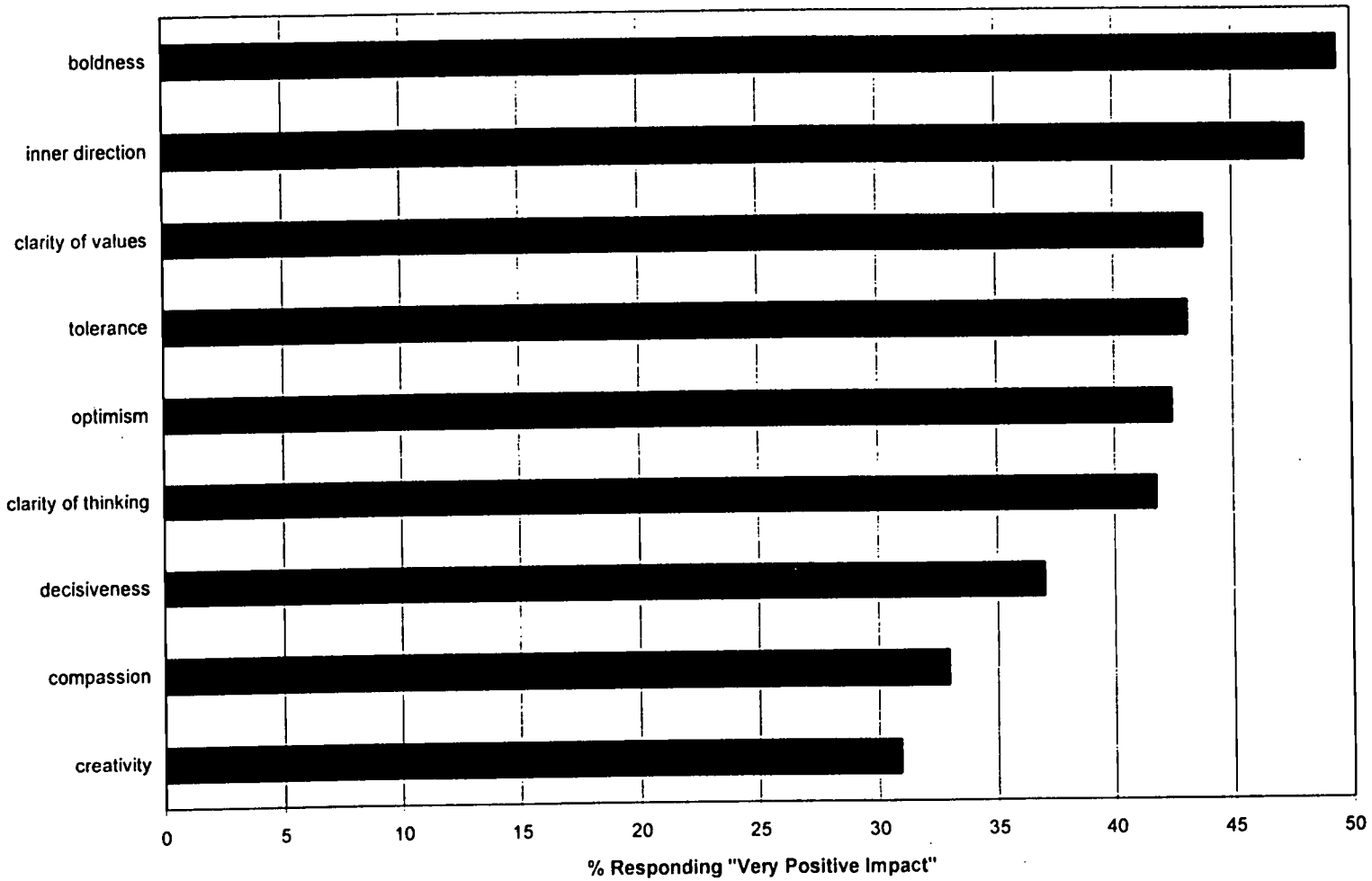

Aspects of Personal Development Perceived to be
Very Positively Influenced by Programs
boldness
inner direction
clarity of values
tolerance
optimism
clarity of thinking
decisiveness
compassion
creativity
0
5
10
15
20
25
30
35
40
45
50
% Responding "Very Positive Impact"

FIGURE 2-28

Perceived Program Influence on Personal Development, By Years Since Participation

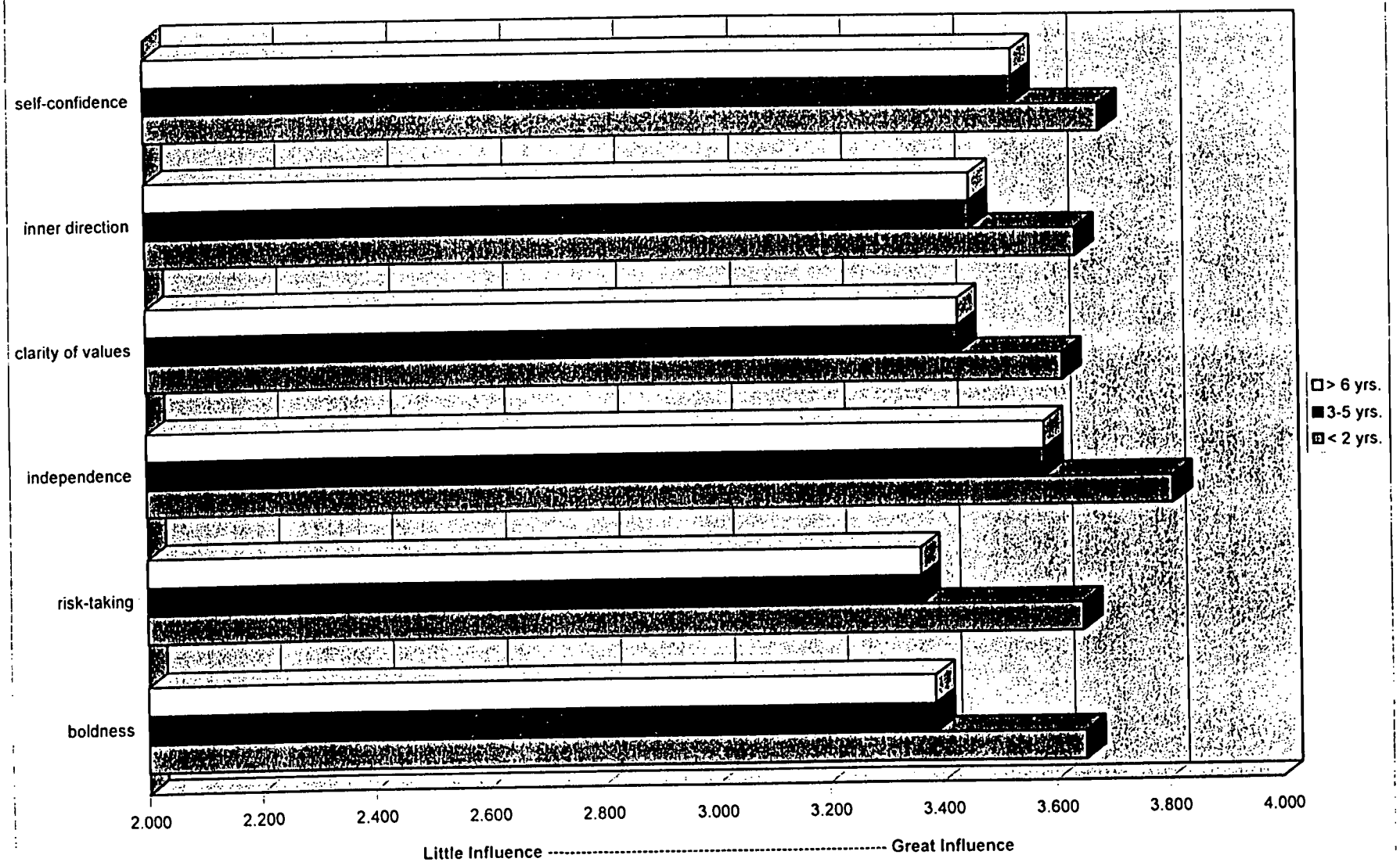


FIGURE 2-29

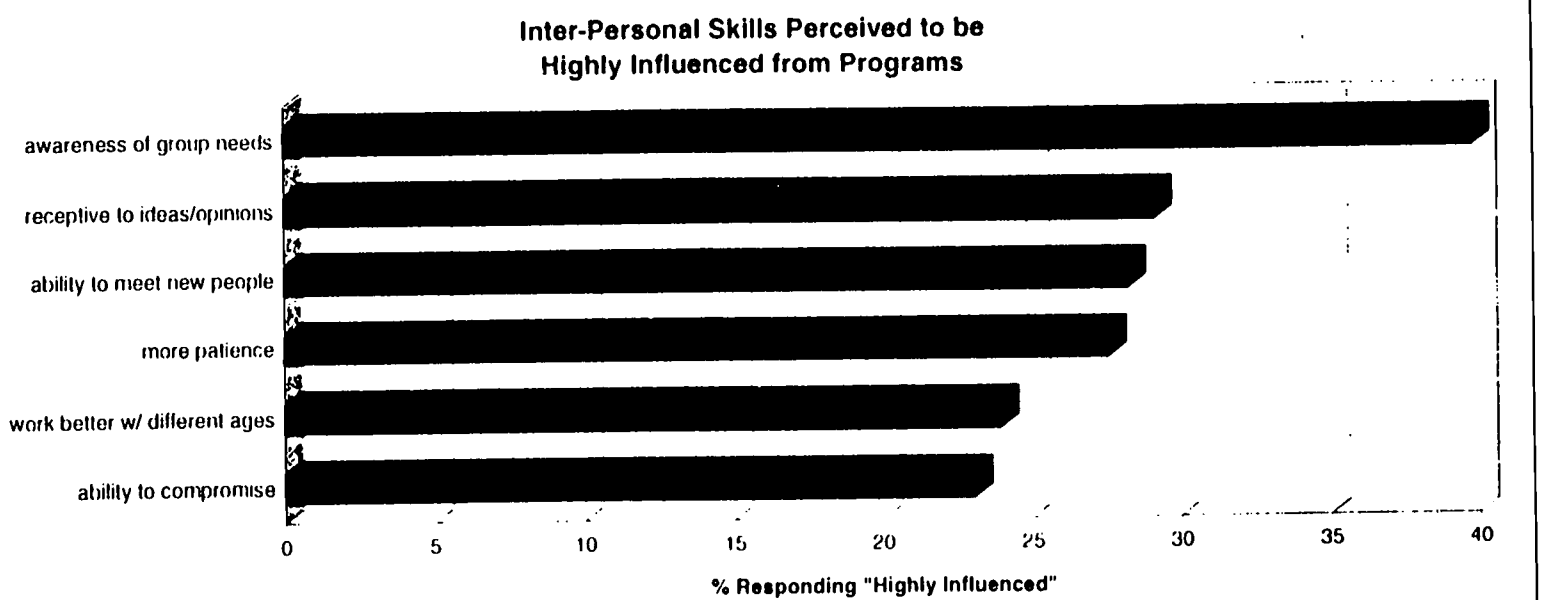

Inter-Personal Skills Perceived to be
Highly Influenced from Programs
awareness of group needs
receptive to ideas/opinions
ability to meet new people
more patience
work better w/ different ages
ability to compromise
0
5
10
15
20
25
30
35
40
% Responding "Highly Influenced"

FIGURE 2-30

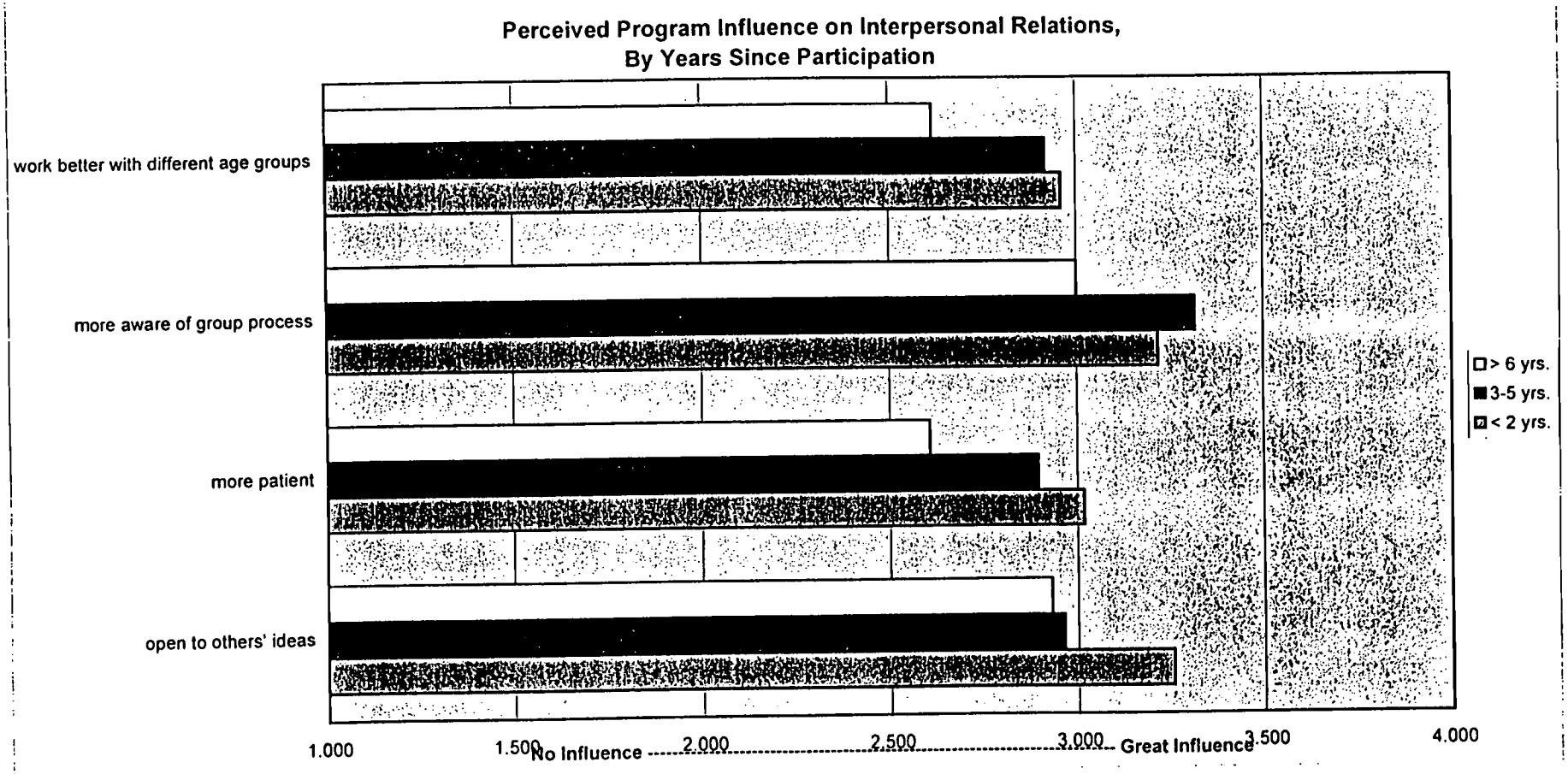

Perceived Program Influence on Interpersonal Relations,
By Years Since Participation
work better with different age groups
more aware of group process
more patient
open to others' ideas
> 6 yrs.
3-5 yrs.
< 2 yrs.
1.000
1.500
No Influence
2.000
2.500
3.000
Great Influence
3.500
4.000

FIGURE 2-31

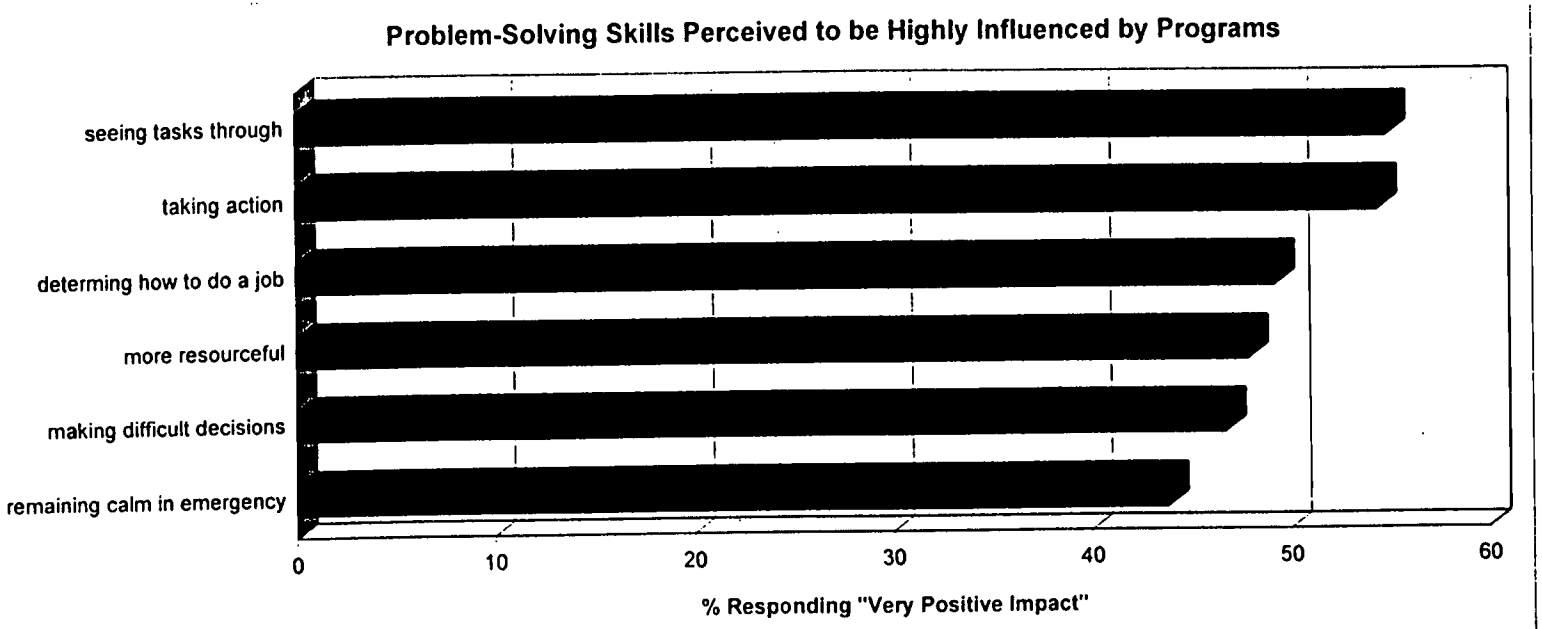

Problem-Solving Skills Perceived to be Highly Influenced by Programs
seeing tasks through
taking action
determing how to do a job
more resourceful
making difficult decisions
remaining calm in emergency
0
10
20
30
40
50
60
% Responding "Very Positive Impact"

FIGURE 2-32

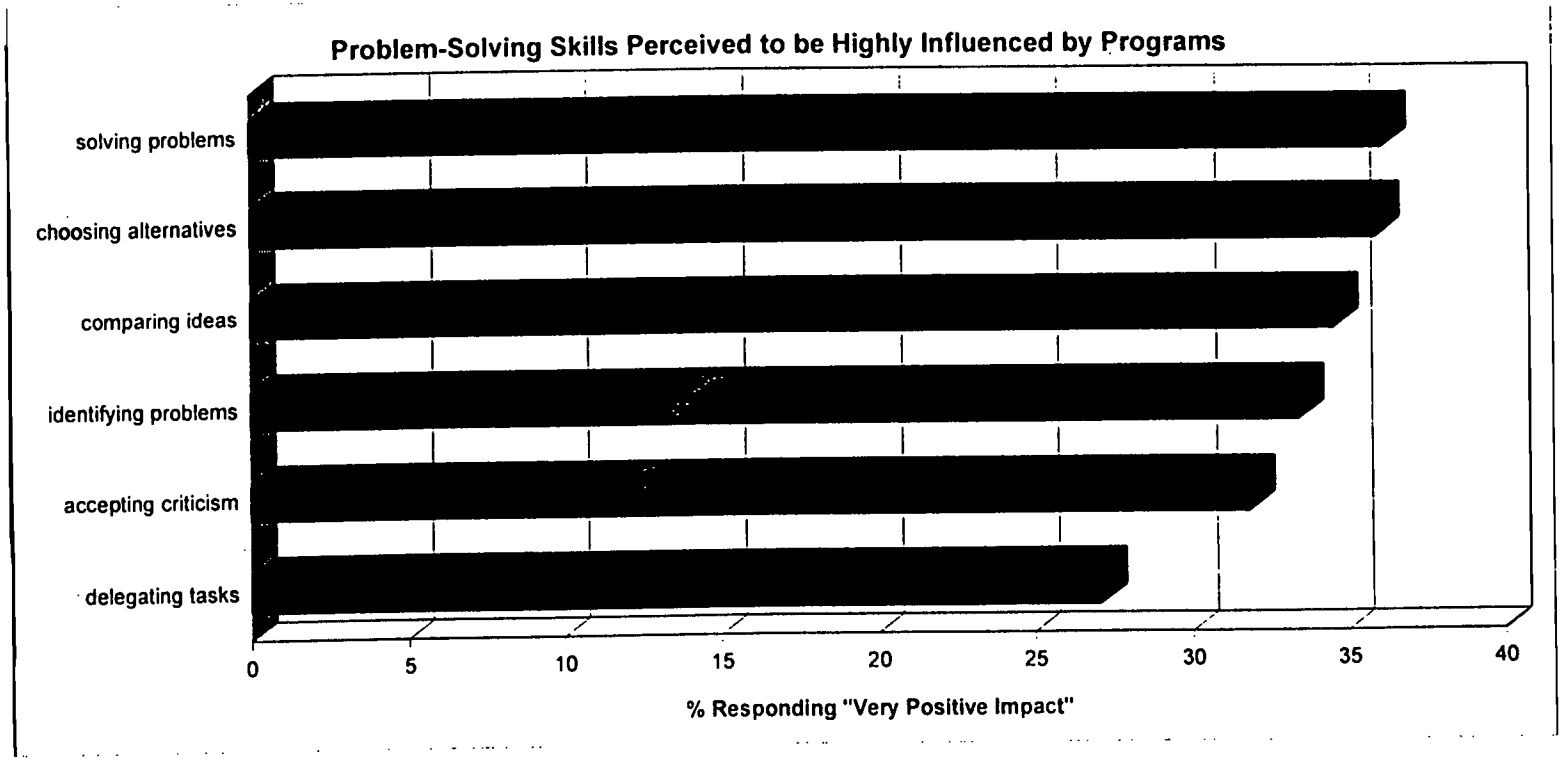

Problem-Solving Skills Perceived to be Highly Influenced by Programs
solving problems
choosing alternatives
comparing ideas
identifying problems
accepting criticism
delegating tasks
0
5
10
15
20
25
30
35
40
% Responding "Very Positive Impact"

FIGURE 2-33

Perceived Program Influence on Probem-Solving, By Years Since Participation

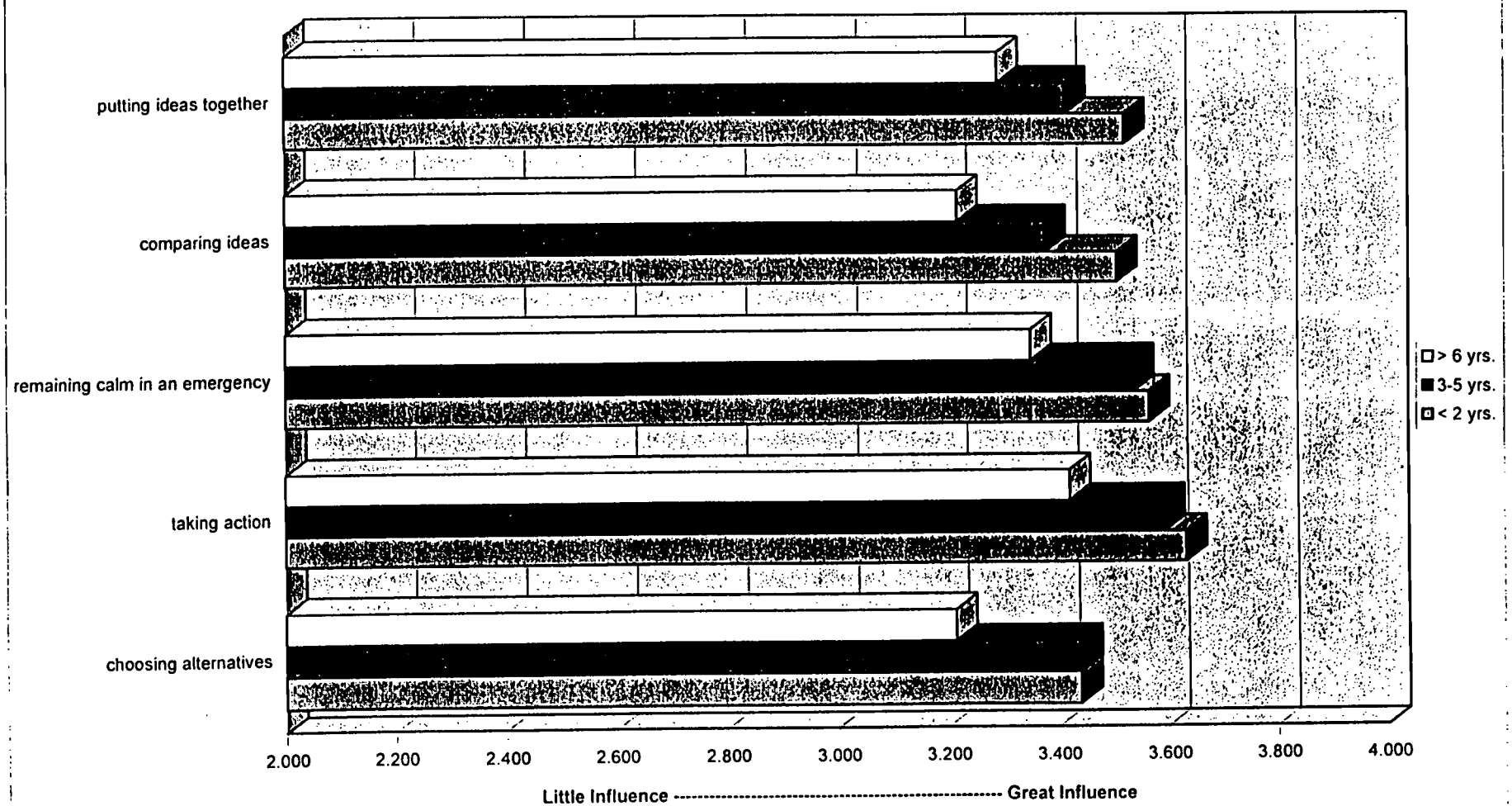


FIGURE 2-34

Perceived Program Influence on Problem-Solving, By Years Since Participation

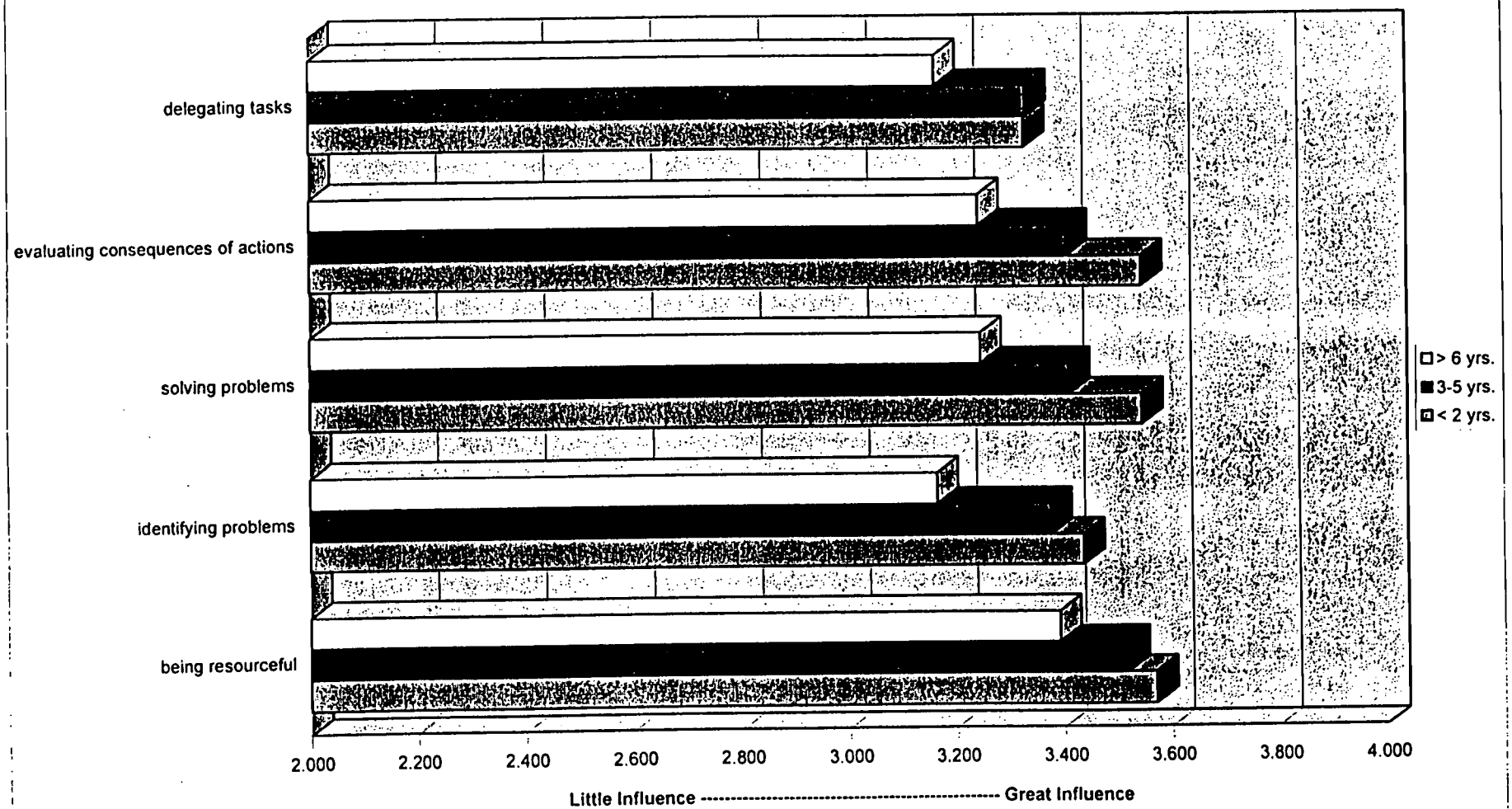


FIGURE 2-35

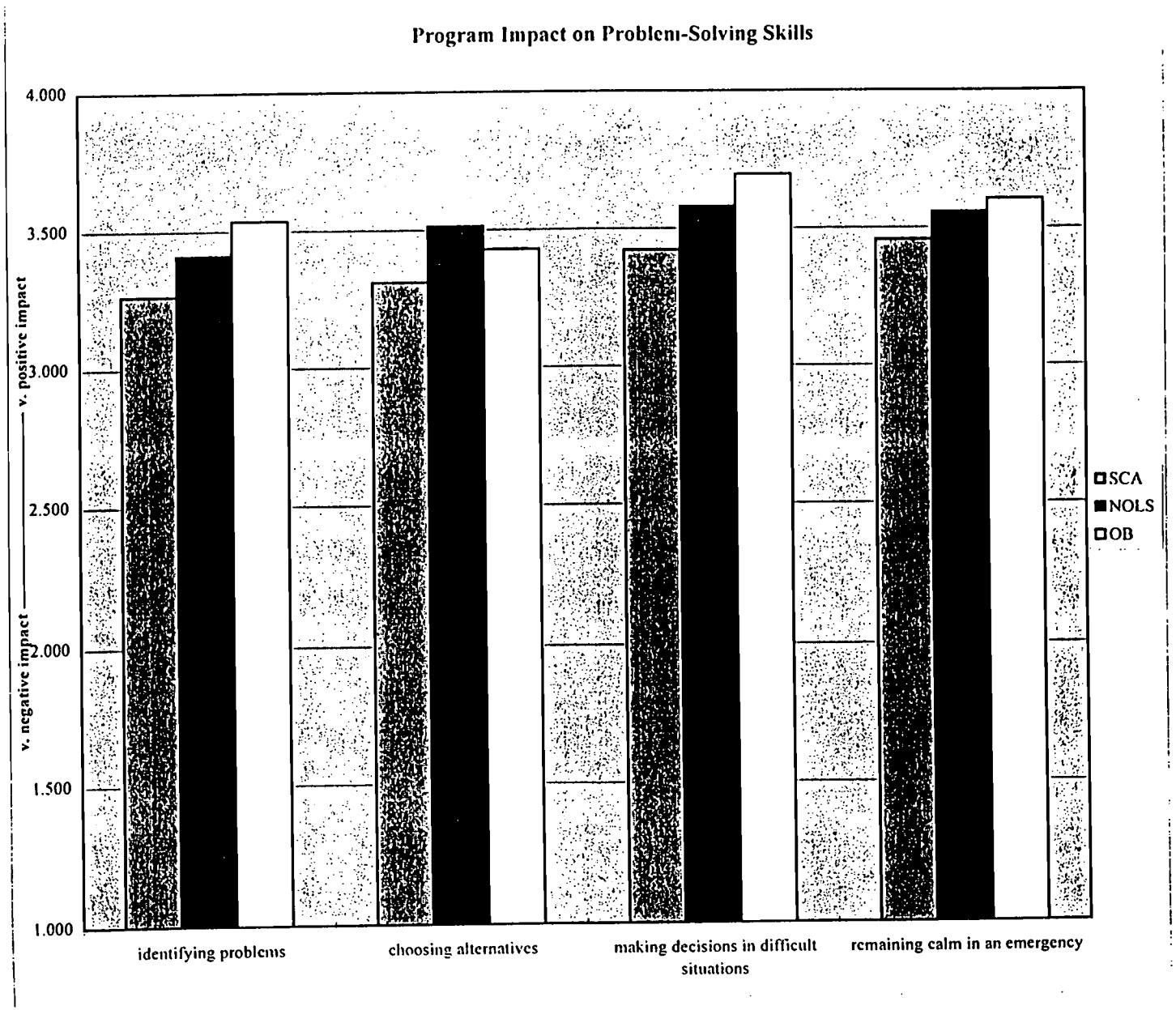
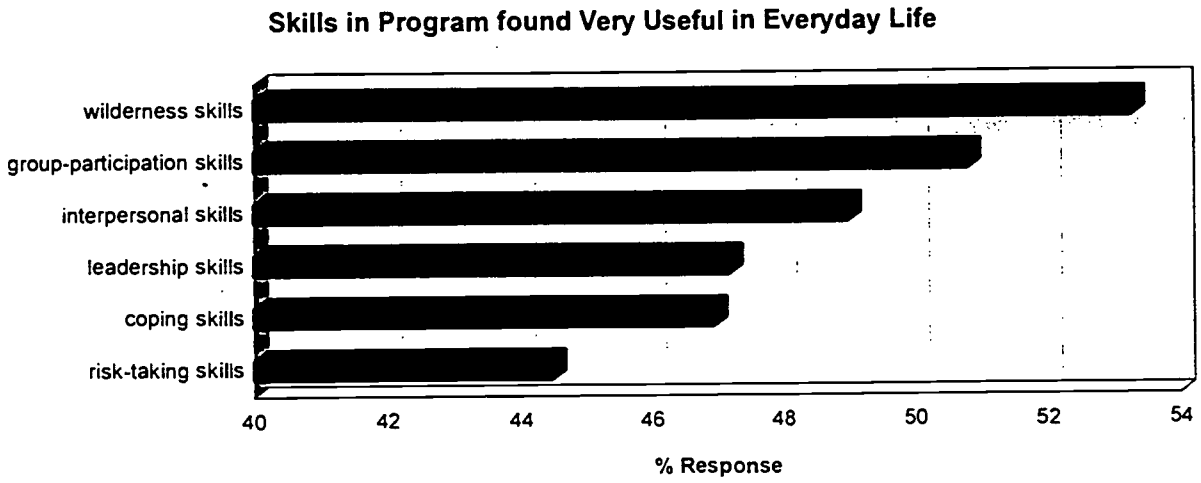


FIGURE 2-36


Skills in Program found Very Useful in Everyday Life
wilderness skills
group-participation skills
interpersonal skills
leadership skills
coping skills
risk-taking skills
40
42
44
46
48
50
52
54
% Response

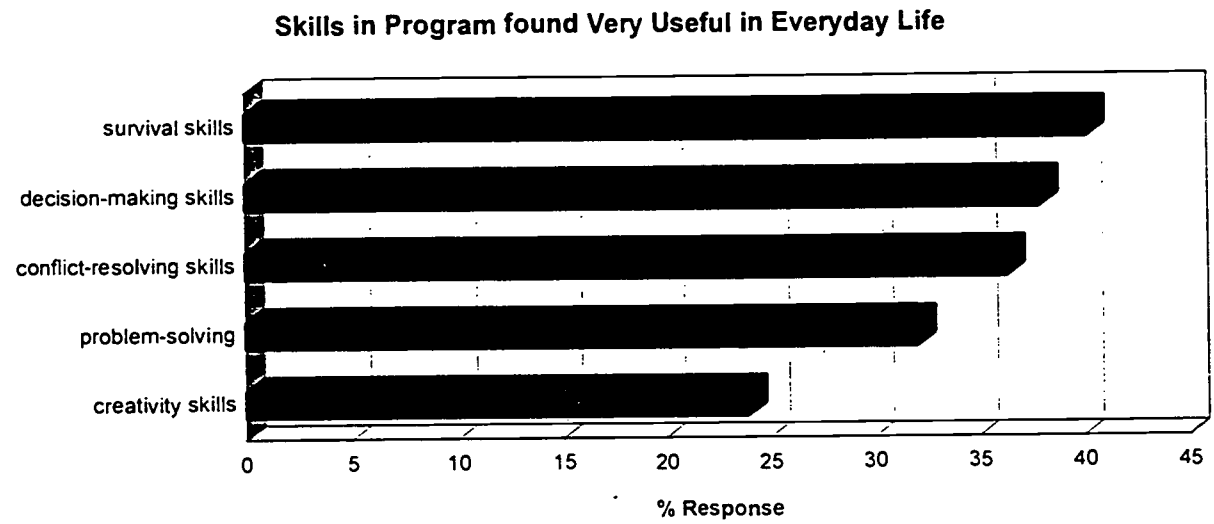
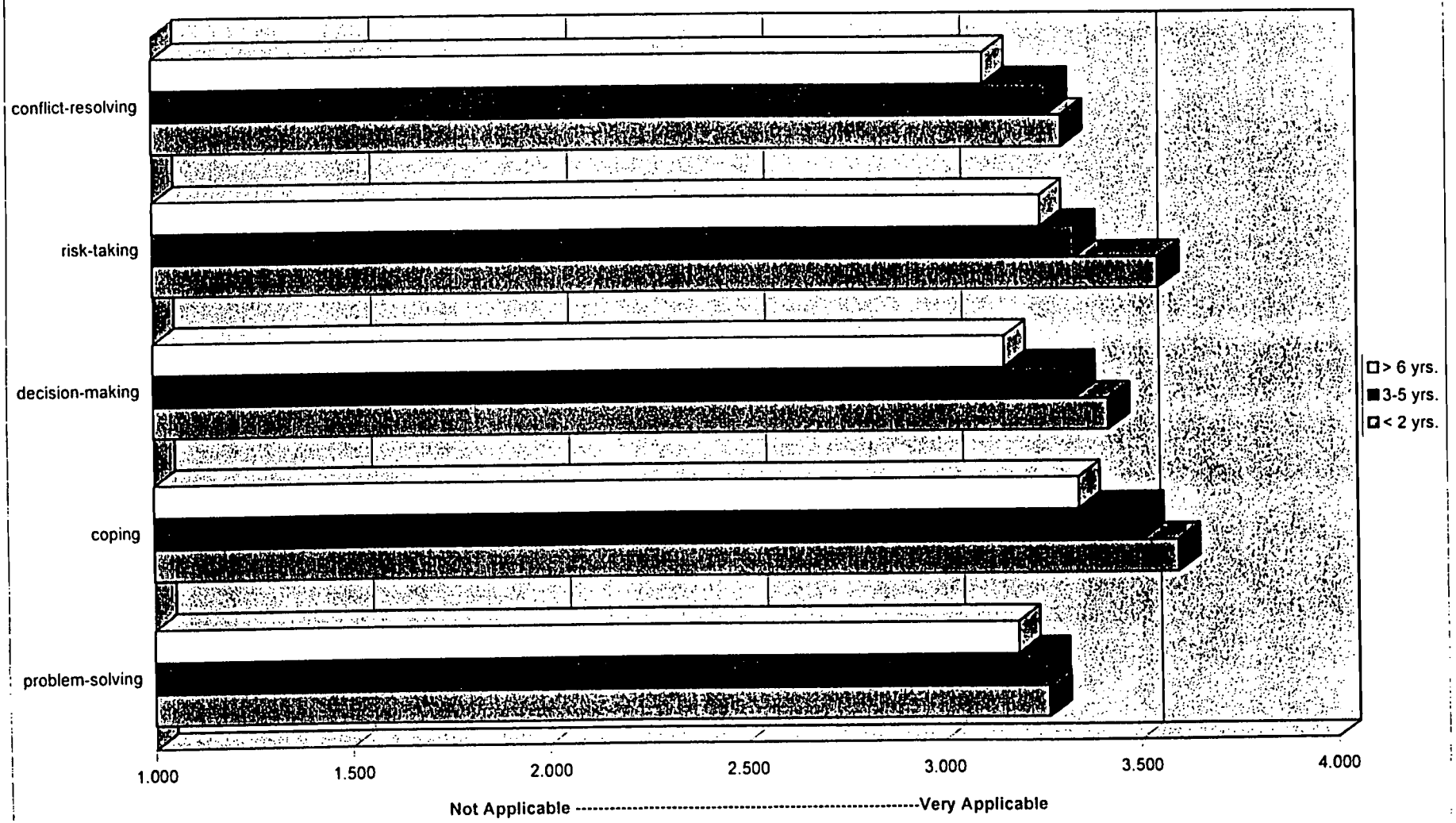

Skills in Program found Very Useful in Everyday Life
survival skills
decision-making skills
conflict-resolving skills
problem-solving
creativity skills
0
5
10
15
20
25
30
35
40
45
% Response

FIGURE 2-37

Perceived Applicability of Program Skills to Everyday Life, By Years Since Participation



CHAPTER 3

LONGITUDINAL STUDY RESULTS

The methodology of the longitudinal study was described in the first chapter and will only be briefly reviewed here. In the longitudinal study, we collected data on participants of Student Conservation Association (SCA), National Outdoor Leadership School (NOLS), and Outward Bound (OB) programs just before, immediately after, and six months following outdoor experiences in the summer 1997 in the Western United States. A structured survey was used, largely patterned after the one employed in the retrospective investigation. The before program survey focused on past experience and anticipated program effects, while the six month follow-up survey omitted many less critical questions to reduce respondent burden and hopefully increase the mail response rate. The immediately following survey was nearly identical to the one employed in the retrospective investigation. Before and immediately following surveys were distributed in person, while the six-month follow-up, for logistical and practical reasons, was administered by mail. An in-depth, open-ended, structured interview was conducted in person with one participant of each outdoor group immediately before and after the program experience, and by telephone six months later.

The sample size for the before and immediately following research was 296. Roughly half the participants completed the six-month follow-up mail survey. Thus, the number of respondents in the longitudinal research was substantially less than in the

retrospective study, although the quality of the data in the longitudinal study was presumably better than in the retrospective research, once more underscoring the complementary significance of the two investigations.

Two additional differences between the two studies should be noted. Longitudinal study respondents participated in programs in the western United States – NOLS participants in the intermountain and southwestern states, SCA in the intermountain and Pacific northwest, and OB in the Pacific northwest. In the retrospective study, SCA and NOLS respondents participated in programs throughout the United States, although largely in the West, while OB participants were drawn from the North Carolina School whose programs occur in the southeast. Because of Outward Bound's decentralized structure with each School possessing a distinctive character and emphasis, the OB longitudinal data drawn from the Pacific Crest School in Portland, Oregon is somewhat different from the retrospective data derived from alumni of the North Carolina School. Additionally, OB respondents in the longitudinal study included a sub-sample of young teenagers who participated in the organization's Outward Venture program. Finally, the SCA longitudinal study sample differs from the SCA retrospective research in including High School and Conservation Career Development and not Resource Assistant program participants.

To simplify the presentation, as in the retrospective chapter, figures rather than tables are used, although as indicated, a forthcoming appendix will include tables and associated tests of significance. Data collected at three points in time for three organizations necessarily produced a large number of results. To expedite comparisons among organizations for the three time periods, mean scores rather than percentages are

employed. Statistically significant results are largely emphasized in the figures and discussion.

Overall Impact

Like the retrospective study, the perceived overall impact of the experience was pronounced and dramatic in the longitudinal research. Figure 3-1 reveals nearly 80% of participants rated the overall impact of their programs as very worthwhile immediately following participation, only 2% regarding the experience as not very or not at all worthwhile. Moreover, no decline in perceived impact occurred six months after participation. Indeed, the perception of positive worth and impact of the experience **significantly increased** during this time interval. Despite very different methods and samples used in the two studies, both investigations similarly found a very large proportion of participants reporting a very positive view of their outdoor experience.

Figure 3-2 provides additional perspective regarding the perceived worth of the programs in the longitudinal study. A remarkable 52% of participants immediately following their programs viewed it as one of the very best experiences in their life, an additional 36% as very good, while only 3% said the program was either not very good or they would never do it again. Moreover, this degree of positive perception **increased substantially** over time, 75% rating the experience six months later as one of the best in their life, 20% as very good, and only 1% reporting they would never do it again. Nearly 75% believed the outdoor experience would have a major influence on their life immediately following the programs, and this figure rose to a remarkable 95% six months later. Finally, as in the retrospective research, the two areas of greatest impact were

outdoor recreational interest and personal development (e.g., maturity, independence, self-confidence), while the least affected areas included career choice and interest in community service (Figures 3-3 & 4).

This degree of positive outlook occurred among all organizations, although it was most evident among SCA and NOLS and, to a lesser extent, OB participants (Figures 3-5 & 6). SCA participants more often reported the program experience would affect their career choice and interest in community service than did NOLS or OB respondents (Figure 3-7). SCA and NOLS participants were also more likely than OB respondents to report substantial impacts on environmental and outdoor recreational interests, as well as intellectual and personal development (Figures 3-8 & 9).

Finally, the results should be noted of two questions on overall impact asked on only the six-month follow-up survey. The great majority of respondents reported after this period of time they had been able to incorporate much of what they had learned in their programs into their everyday life, and most indicated their feelings about their local environment had changed as a consequence of participation. OB participants reported less impact in both respects than did NOLS or SCA respondents.

The most frequently cited reasons why the respondents chose to participate in their programs included interest in having a wilderness experience, outdoor adventure, and developing outdoor skills. The least cited reasons included the desire to make new friends or family pressure to participate. Among organizations, SCA respondents were more likely than NOLS or OB participants to indicate an interest in doing beneficial work, while NOLS participants reported a greater interest in developing leadership and interpersonal skills. OB and SCA-CCDP participants more often cited than SC-HS or

NOLS respondents family pressure as a reason to participate; SCA-CCDP respondents reported a relatively stronger interest in personal development and were less motivated than other participants by the desire to have a wilderness experience.

Additional perspective is provided on the overall impact of the experience by the following participant remarks.

I can't say enough about the program...I certainly feel it was one of the most significant experiences in my life.

It made me much more aware of my connection to the earth and clarified my knowledge of what I want and need out of my life.

The skills I obtained made me a better person at home, and I...use them wherever I go.

It was the best thing in my whole life. I won't ever forget it – really an opportunity to be independent and find myself. I am more content, compassionate, and self-aware than I have ever been.

It affected the way I look at people, the way I feel about myself, the way I look at the natural world,...and in general the way I lead my life.

I would recommend this program to anyone who would like a life-changing experience. The people I met were all amazing. I LOVED IT!!

I found strength in myself I didn't know I had. I met wonderful people and learned a lot about myself and what motivates me. I think it was and will be the most significant experience in my life.

Environmental Interest, Knowledge, Attitude, and Behavior

Figures 3-10 and 3-11 reveal a pattern of dramatic increases in anticipated participation in various outdoor activities immediately following program participation. For example, the percentage of respondents who reported they had participated a great deal or moderate amount in backpacking-camping and hiking activities prior to the programs, and then expected to participate in these activities immediately following, increased from 47% to 78% and 56% to 80%, respectively. Yet, six months later, actual participation was often substantially lower than anticipated, particularly with respect to backpacking, camping, hiking, water sports (e.g., canoeing, kayaking, rafting), and skiing. On the other hand, actual participation six months later was significantly higher than before the programs for most of these activities, particularly the amount of backpacking, camping, hiking, adventure travel and, to a less extent, rock and mountain climbing, and water sports. Additionally, wildlife observation increased in comparison to what had been anticipated immediately following program participation. Skiing was the only activity with a lower participation rate six months after when compared with before program participation.

Among organizations, OB respondents generally reported lower actual and anticipated participation rates for most of these activities, with the exception of fishing

and hunting (Figures 3-12, 13, & 14). These organizational differences in actual participation were less pronounced six months later, especially water sports, adventure travel, scientific study, and wildlife observation.

The most frequently cited outdoor recreational interests both before and after program participation included camping, seeing attractive scenery, wildlife observation, and outdoor challenge activities (e.g., rock, mountain climbing). The least cited outdoor recreational interests both before and immediately following the programs were hunting and fishing, outdoor hobbies (e.g., butterfly collecting, birdwatching), scientific study, and visiting historic areas. Immediately following the programs, very substantial increases were noted in interest in wildlife observation, seeing attractive scenery, outdoor hobbies, and the spiritual importance of nature. Slight increases occurred immediately following program participation in interest in camping, hiking, fishing, hunting, and practical outdoor activities (e.g., gathering firewood, collecting wild foods). Six months after participation, no decline was noted in interest in most of these outdoor activities, with the exception of a significant increase in interest in practical outdoor pursuits. These findings are illustrated by the results of Figures 3-15 and 3-16.

Among organizations, we encountered substantially less interest among OB participants in nearly all these outdoor areas, and this occurred in the pre-, post-, and six month follow-up surveys (Figures 3-17, 18 & 19).

Major improvements in various outdoor skills were reported by most respondents immediately following program participation, especially minimum impact and wilderness camping, identifying human environmental impacts, and map and trail reading (Figure 3-20). These skills generally remained strong six months later, with the exception of either

stagnant or declining levels of geological and fire-setting abilities. Among organizations, few substantial differences were noted, with the exception of declining proficiency among SCA respondents in comparison to NOLS and OB participants in minimum impact camping and map and trail reading (Figure 3-21 & 22).

Significant increases in perceived knowledge of the natural environment were reported by most respondents as a consequence of program participation, particularly knowledge of human environmental impacts, conservation, wildlife, and general environmental awareness (Figures 3-23 & 24). By contrast, a majority of respondents reported little or no program impact on their knowledge of environmental justice, government natural resource agencies and laws, hydrology, and environmental interest groups. Moderate impacts occurred in plant and animal identification, and knowledge of geology, geography, ecology, botany, forestry, and land use history. Only modest attrition occurred in most of these environmental knowledge areas six months following participation, with the exception of substantial decreases in plant and animal identification, and knowledge of geology, geography, and hydrology. Six months later, slight increases were reported in knowledge of human environmental impacts and general environmental awareness. Among organizations, OB respondents generally reported less overall knowledge or change in environmental knowledge as a consequence of program participation (Figures 3-25, 26, & 27).

An environmental knowledge scale was constructed based on responses to 14 multiple-choice questions. These questions were included on the before and immediately following and not six month after surveys. We observed no substantial improvement and even a slight decline in scores on the knowledge scale (Figure 3-28). Among

organizations, SCA participants had the highest knowledge scale scores on both the pre- and post-program surveys, and only this organization's respondents showed no decline in the after program survey, although these scores were not statistically significant different from NOLS respondents (Figure 3-29). OB participants had substantially lower knowledge scale scores before and immediately following program participation.

Like the retrospective study, major changes were observed in the longitudinal research in attitudes toward the natural environment. Most respondents reported their outdoor experiences had greatly affected their attitudes toward nature and these views remained strong a half year after participation. Figure 3-30 reveals the majority of respondents reported their outdoor experience had exerted a great deal of impact on respect, awe, aesthetic appreciation, and responsibility for conserving the natural environment. Areas of least impact included awareness of the sights and sounds of nature, willingness to render economic sacrifices to protect the natural environment, and harmony with nature. Yet, even in these areas, some four-fifths of respondents reported a moderate to great deal of impact. Only slight or no declines in perceived impact on these attitudes toward nature occurred six months after participation, with the exception of a moderate decrease in awareness of the sights and sounds of nature and willingness to render economic sacrifices to protect the natural environment. OB respondents often reported less pronounced, but still substantial, impacts on environmental attitudes both immediately following and six months after program participation (Figures 3-31 & 32).

Another question explored attitudes and perceptions of the natural environment and, again, highly positive impacts were observed. Most respondents reported their program experience had greatly affected interest in outdoor recreation, desire to

physically test themselves in nature, interest in using outdoor skills, inclination to reduce litter and waste, enjoyment of living in the wild, and feelings of spiritual connection and humility toward nature (Figures 3-33 & 34). Most of these attitudes remained strong and, in many cases, strengthened six months after program participation. Additionally, significantly fewer respondents reported discomfort in primitive settings or a view of wilderness as frightening and dangerous when responses immediately following participation were compared with those six months later. These attitudinal impacts were often less evident among OB respondents, both immediately after and six months following program participation (Figures 3-35, 36, 37, & 38).

A number of attitude questions explored broad values of nature not specifically tied to the program experiences. The respondents generally expressed highly positive, appreciative, and protectionist sentiments toward the natural environment based on responses to the questions on the before and after program surveys. Additionally, substantial changes occurred in some of these attitudes immediately following program participation and, in many cases, strengthened six months after the experience. The desire to conserve and protect nature, especially wilderness areas, generally increased immediately following program participation and became more pronounced six months later. A pattern of significant increases in personal interest and affinity for remote and undisturbed natural areas was also observed immediately following participation and these views generally strengthened six months later. Among organizations, few significant differences occurred among NOLS with SCA participants, while OB respondents tended to express less pronounced levels of affinity, aesthetic appreciation, and concern for nature and its conservation.

Several questions explored respondents' interest in learning about nature, conservation, interest in environmental service and careers, and views of several environmental issues. Respondents tended to regard air and water pollution, loss of plant and animal habitat, excessive litter and trash, and species extinction as the most serious environmental threats facing humanity today. The least significant problems, although still viewed by a majority as moderate to very serious, were overuse of the national parks, declining urban environments, and loss of open space and recreation lands. No significant decline in perception of the seriousness of these issues occurred six months after the programs. Very pronounced increases in the perceived seriousness of overuse of the national parks, human population growth, and loss of open space was observed six months after participation.

Immediately following their programs, most participants believed the experience would greatly influence their interest in school, incentive to improve grades, desire to learn about the environment, and involvement in school environmental activities. Significant decreases occurred, however, in most of these areas when views immediately following program participation were compared with actual reported behavior six months later. The only area of substantial increase was interest in learning about the environment in school. This pattern occurred among all organizations, with the exception of no significant increase among OB respondents in desire to learn about the environment in school six months after the program.

Regarding specific subjects, the respondents reported the greatest interest in learning about biology, ecology, wildlife and resource management, and environmental policy and education. Less but still substantial interest was indicated in hydrology,

geology, and geography. OB participants generally reported the least interest in most of these subjects, while SCA respondents often expressed the greatest curiosity.

A somewhat discouraging pattern was observed in participants' anticipated and actual conservation behaviors, as well as interest in volunteering, environmental education, and environmental jobs and careers. Figure 3-39 reveals most respondents anticipated a marked increase in such environmental activities as writing letters, protesting, working with citizen groups, volunteering, and taking courses immediately following program participation. Actual involvement six months later was often dramatically less than anticipated, frequently insignificantly different and sometimes less than reported before program participation. The exceptions to this pattern, with little change during the three time periods, included more personal behaviors such as avoiding certain products, recycling, and reading (Figure 3-40).

A similar pattern emerged regarding interest in community service and environmental education with respondents indicating substantially increased interest and anticipated involvement immediately following program participation (Figures 3-41 & 42). Actual behavior six months later, however, was often substantially less than immediately following and even prior to program participation. On the other hand, interest in environmental jobs and careers increased immediately following and six months after the programs. Among organizations, SCA participants generally reported greater interest and actual involvement in various conservation activities, as well as interest in community service and environmental careers, especially in comparison to OB participants (Figures 3-43 & 44).

Thus, environmental attitudes and outdoor recreational interests (and, as we shall see, personal character and development) reveal a pattern of far greater program impact than conservation behavior. Before concluding this section, some anecdotal and often powerful participant reflections are provided regarding the impact of the outdoor experience on attitudes, knowledge, and behavior toward the natural world.

The experience taught me to...appreciate the wilderness and motivated me to want to care for the natural environment around my home and to educate others on the importance of protecting it. I think [it] really strengthened my spiritual connection to nature and my passion for the wilderness.

Before I traveled out here with my family, we would stay in nice lodges and motels. Maybe we would take a short hike up to a nice view. But when I got to see the backcountry and the mountains – I was so in awe that my jaw dropped. There it is – wow! It was like a wake up call.

I always had respect for nature, but I had never worked for the respect. I had never changed the way I walked, ate, or drank for it.

When I first got back...I was just going through...withdrawal...Well, there is a creek running through my backyard. [The program] made me more aware of things that can harm the creek...It made me more aware of my backyard.

I learned how everything works together. At home I'd see a bird, and think "there's a bird." But, out there, you see the bird, plus what the bird eats, plus what the bird's food eats...

I learned the importance of simplicity in life in every way possible. My program put me in touch with the earth, something which has remained with me though I no longer am in a [wilderness] setting.

I'm much more aware of the beauty that surrounds me now that I've realized the intricacies of the natural world.

I always had a high level of respect for the environment, [but] my sense of stewardship has changed. There is a lot that can be done, and I want to do it.

Personal and Character Development

Impacts on twenty-three aspects of personal development were considered in the before and immediately following program surveys, while 17 of these were covered in the six month follow-up survey (the smaller number, as indicated, to reduce respondent burden in the mail survey). Participants reported very positive impacts on nearly every aspect of personal development included in these surveys. Figure 3-45 reveals the most dramatic and sustained effects occurred in several dimensions of physical well being. More than 70% of participants indicated very positive impacts on physical health, stamina, and strength immediately following, and in the latter two respects, six months

after the programs. The great majority also reported almost this degree of impact on several attributes of personal autonomy including independence, self-reliance, and comfort with being alone. Figure 3-46 further indicates slightly less but still pronounced impacts on aspects of taking action and decisiveness including risk-taking, boldness, initiative, and clarity of thinking. Finally, Figures 3-46 and 3-47 reveal less extensive, but still impressive, majorities indicated very positive effects on such elements of self-concept as self-esteem, self-respect, peace of mind, inner direction, and optimism. Little change occurred in perceived impact in nearly every attribute covered six months following program participation.

Figure 3-47 indicates most respondents reported very positive program effects on feelings of compassion and tolerance for others initially following program participation. Substantial declines were observed, however, in these variables six months later, levels of compassion even dropping below that reported prior to program participation. Major declines were also noted in levels of creativity, clarity of values, and inner direction when comparing views immediately following with those six months later (Figure 3-47). Reported impacts on creativity and clarity of values were not significantly different six months after with that reported before program participation.

Among organizations, NOLS, then SCA and, to a less extent, OB participants reported positive impacts on most aspects of personal development (Figures 3-48, 49, 50, 51, & 52). Organizational variations tended to be most pronounced in personal satisfaction, autonomy, and contentment. The least differences occurred in physical well being, decisiveness, and decision-making. NOLS respondents generally reported the most dramatic improvements in personal and character development immediately

following program participation, with few significant declines noted six months later, the exceptions being substantial decreases in creativity, risk-taking, and maturity. SCA respondents also reported pronounced improvements in most aspects of personal development immediately following program participation, the exception being only minor impacts on creativity, compassion, clarity of values, comfort with being alone, and optimism. Few significant changes occurred among SCA respondents six months after participation. OB respondents generally reported the least pronounced changes in personal development, with no statistically significant differences occurring in one-third of the attributes covered when responses before program participation were compared with those immediately following the programs. Additionally, OB respondents were more likely that other organizational participants to report substantial declines in many of these attributes six months later, particularly tolerance, compassion, clarity of thinking, independence, clarity of values, and inner direction.

Nine dimensions of interpersonal relationship were also examined. These results were generally less striking than those of personal development. Figure 3-53 reveals the great majority of respondents reported greatly increased awareness of group needs immediately following program participation and this impact was sustained six months later. A significant but less pronounced improvement occurred immediately following program participation in receptivity to the ideas of others, ability to compromise, and patience. By contrast, very substantial declines were noted in patience and the ability to compromise, although a dramatic increase was noted in receptivity to the ideas of others, six months later.

An unexpected result was the tendency of most respondents to report immediately following program participation limited program effects on perceived levels of trust, ability to meet new people and work with different age groups (Figure 3-54). Six months later, however, a significantly larger percentage of respondents indicated substantial program impacts on these elements of interpersonal relationship. It would appear program impacts on the ability to work with others may become more apparent over time.

A discouraging result was only negligible impacts immediately following program participation in concern for others' feelings, as well as acceptance of other racial and ethnic groups (Figure 3-54). Moreover, very substantial declines occurred six months later in perceived program effects on these variables, and these reported levels were well below those indicated prior to program participation.

Among organizations, differences were generally insubstantial, a slight tendency occurring among NOLS participants to report greater interpersonal impacts, particularly six months later (Figures 3-55, 56, 57, & 58). Again, we observed six months later a discouraging decline among all organizations, especially among OB respondents, in perceived program impact in acceptance of other racial and ethnic groups (Figure 3-59).

The outdoor experience was generally perceived as contributing substantially to several aspects of problem-solving ability. Figure 3-60 reveals pronounced and sustained improvements in seeing tasks through to completion, taking action, general problem-solving, making difficult decisions, accepting criticism, delegating tasks, and determining how to complete a task as a consequence of program participation. By contrast, only initial improvements were noted followed by substantial decreases six months later in perceived resourcefulness, identifying problems, evaluating consequences, and choosing

among alternatives (Figure 3-61). Finally, only slight improvements were reported in comparing and putting ideas together following program participation (Figure 3-61).

Among organizations, NOLS respondents generally reported the greatest improvement in these problem-solving skills immediately following program participation, and the fewest declines six months later (Figures 3-62, 63, 64, 65, & 66). OB respondents often reported the least change or improvement in these problem-solving abilities, particularly in comparison to NOLS participants, especially in the areas of resourcefulness, identifying and understanding problems, taking action, seeing tasks through to completion, determining how to do a task, and accepting criticism.

Finally, respondents reported on the applicability to everyday life of varying skills emphasized or acquired in their programs. Most respondents initially anticipated and then reported six months later that many skills emphasized or acquired in their programs had proved quite useful in the everyday world. Figure 3-67 reveals that skills viewed as most relevant to daily life included leadership, group participation, risk-taking, interpersonal, and conflict resolving skills. The skill regarded as least relevant (perhaps because of its limited program development, as indicated by previous findings) was creativity (Figure 3-68). Skill areas initially regarded as highly relevant to everyday life, but reported of limited significance six months later included decision-making, general problem-solving, and wilderness skills (Figure 3-68).

Among organizations, a slight tendency existed for NOLS participants to report the greatest applicability of these skills to everyday life, particularly conflict resolving, leadership, wilderness, problem-solving, decision-making, and survival skills (Figures 3-69, 70, & 71). OB respondents reported the greatest degree of impact in risk-taking and

creativity skills (Figure 3-72). Little difference occurred among the organizations in the relevance of group participation and interpersonal skills (Figure 3-73). In general, most respondents believed these skills were widely applicable to modern life although acquired in a largely wilderness context.

We close again with some qualitative remarks that provide an appreciation of the sometimes intense and moving impacts of the outdoor experience on personal and character development.

I am a completely different person now. I have much more self-confidence, which has helped me greatly in life.

[The program] helped me to realize my limits are much farther than what I initially thought them to be. I am able to make smarter, safer decisions.

I can compromise much easier and I have more patience. It has helped me a lot in solving problems and taking initiative.

I learned more about how people tick, what it takes to be with people all day, every day. We tend to get caught up in the world and not take the time to do little things for people. It's the little things [that matter].

It will help [me] to set goals more...I am more confident and will be able to stick to my decisions. Decisions are more decisive in the wilderness than anywhere else.

I have a new self-confidence that I can do anything. My body can withstand anything. I am really strong and confident.

I am more independent. I realized you have to rely on yourself. [There were] no modern conveniences. You have to rely on your ability to adapt to what is near you... You learn what you need and what you don't.

You were always supporting or being supportive. Being in a group, you learn a lot about getting along: what it takes, what it involves. People have a lot of discrepancies. You learn a lot from them. It's like brothers and sisters. You can get in an argument about something, and then an hour later it won't matter. [It's] kinda cool to have that with people that were complete strangers when you started.

[I] experienced a huge boost in confidence [in] my own capabilities... If I can guide myself in the wilderness, then... I can do a lot of other things. I felt really frustrated at first – I thought that I wasn't doing much good. Then when we were done with the project I realized that what I did mattered. It made me feel a lot better about myself.

I came home confident that I could do anything I put my mind to. I hardly ever say "I can't" anymore.

To slow down some, relax, take it easy. Keep the calmness that outdoors brings to you and take that back with you.

Some Qualifications

Most of the results of the longitudinal study revealed positive and sustained impacts, although some findings indicated substantially less pronounced effects and, in a few cases, serious declines six months later. Less impressive results occurred in program effects on factual environmental knowledge, conservation behavior, and aspects of interpersonal relationship. These and other limitations will be discussed in more detail in the final chapter along with some recommendations for possible program improvement. We wish to close for now with a few respondent remarks regarding the ambivalence some felt toward their experience, despite the overall highly positive impacts reported in this chapter.

It shifted my perspective a little bit...I went [on the program] and gathered some strength. The experience now seems so distant. Everything we learned is relevant here, but it is so abstract. [For example,] we learned how to organize and be careful with what we do with our bodies. But with the everyday hustle bustle of daily life it is hard to incorporate [this lesson] into my life.

I [wanted] to go back home...I didn't learn anything...about myself.

[I learned from the program] I don't want to go back to the city or suburbs. It's the epitome of waste. Everyone working for something they don't need.

Conclusion

We wish to conclude by reminding the reader that the longitudinal study was conducted to compensate for various methodological deficiencies of the retrospective research. These included the opportunity in the longitudinal study:

- to interview a much larger fraction of program participants, diminishing the problem of bias associated with large numbers of non-respondents;
- to minimize the distortion associated with recall data;
- to obtain presumably higher quality data.

Despite the methodological differences of the two studies, the results of the longitudinal research were often strikingly similar to those reported in the retrospective investigation. We generally observed in the longitudinal like the retrospective research strong and consistent overall program impacts, substantial changes in environmental attitudes, interests and, to a less extent, knowledge and conservation behavior, and pronounced affects on personal and character development. Moreover, these effects more often than not remained impressive after six months, particularly impacts on environmental attitudes, outdoor recreational interests and activities, personality development, and problem-solving skills.

Most participants in the longitudinal study reported the programs had been very worthwhile, one of the best and most influential experiences of their life, and this

impression remained strong and even strengthened six months after participation. SCA and NOLS participants usually reported the most pronounced effects, particularly environmental impacts among SCA, and character development effects among NOLS respondents. SCA participants also generally indicated stronger impacts on interest in community service, learning about the natural environment, and pursuing an environmental career. OB respondents were often the least enthusiastic about their overall program experience and impacts, but these effects were, for the most part, also strong and sustained.

Pronounced and lasting impacts were observed among most respondents in various aspects of environmental interest, activity, attitude, understanding, and concern. Yet, interest and participation in various outdoor recreational activities and skill areas were often less apparent six months later than initially anticipated following program participation. Still, participation rates six months later were generally much higher than before the programs. We encountered less pronounced changes, and the greatest decline in interest and activity six months later, among OB respondents.

Environmental awareness significantly increased following program participation. On the other hand, only limited change was observed in factual environmental knowledge and conservation behavior, especially six months after the programs. Attitudes toward the natural world, however, were highly influenced by program participation. Most participants in the longitudinal like the retrospective research reported far greater appreciation, affinity, respect, and concern for nature and its protection as a consequence of the outdoor experience. These attitudinal shifts were most evident among NOLS and SCA and least pronounced and lasting among OB participants.

Personal and character development impacts were often dramatic and sustained. These results also strongly paralleled the findings of the retrospective study. Significant effects occurred in many aspects of physical, emotional, and intellectual development, and typically remained strong six months after participation, although substantial attrition was noted in several areas. Significant improvement was reported in many problem-solving skills, as well as in the application of these aptitudes to everyday life. Less pronounced but still relatively considerable impacts occurred in elements of interpersonal relationship. Still, little improvement and even declines were noted in tolerance, compassion, and acceptance of minority and ethnic groups, especially six months following program participation. NOLS, and to a less extent SCA participants, generally reported the most pronounced and sustained impacts on personal and character development.

The final chapter will attempt to integrate the results of the retrospective and longitudinal studies. Some overall generalizations will be advanced regarding the effects of the outdoor experience, as well as reasons why these programs appear to exert such considerable impact on participants. Yet, we will note several program limitations and offer some modest recommendations for improvement. Finally, we will conclude with a

consideration of some broader implications of the findings, particularly the potential role of outdoor experiences in advancing various learning and development objectives.

FIGURE 3-1

Overall Impact

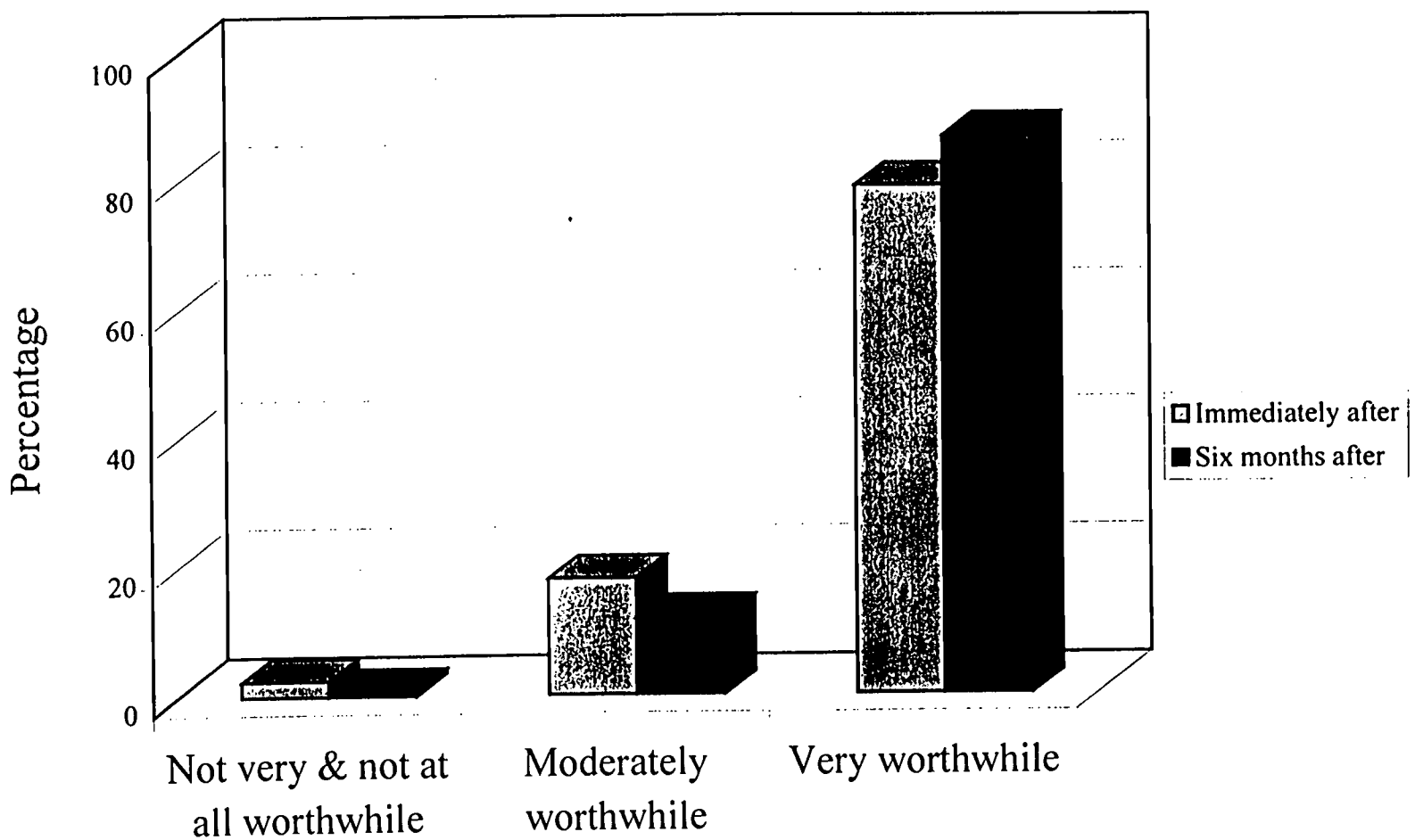


FIGURE 3-2

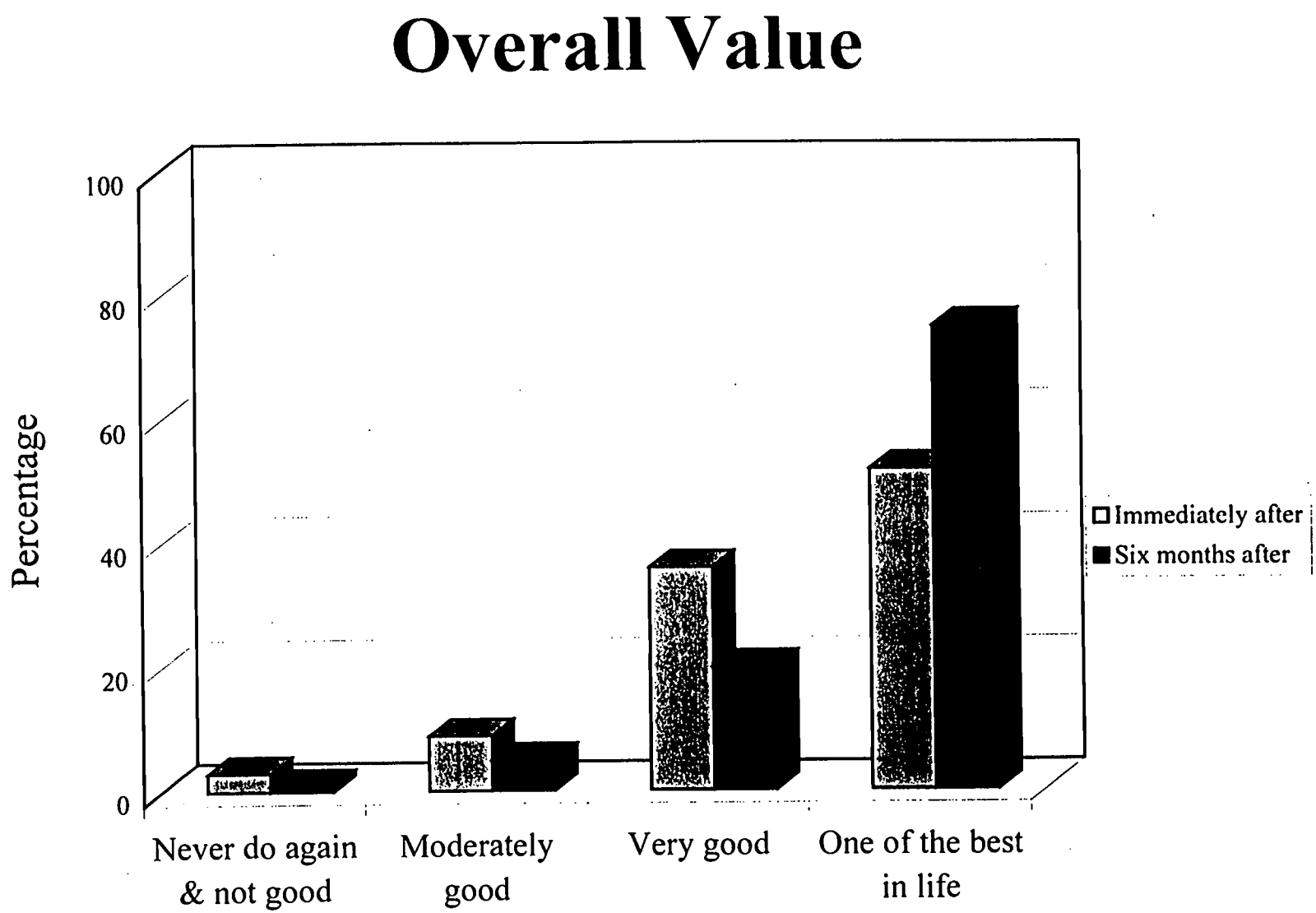
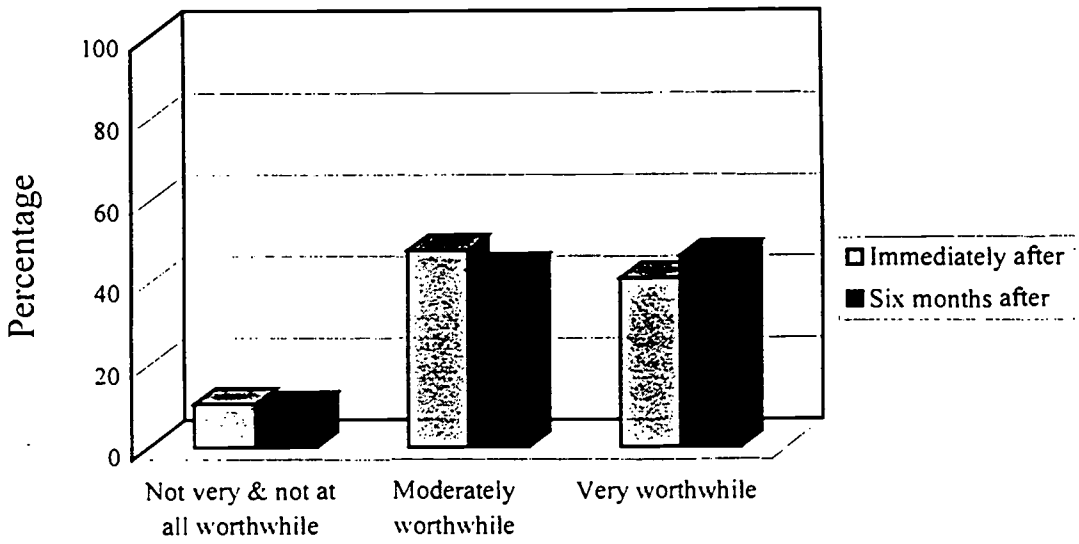

Overall Value
Percentage
100
80
60
40
20
0
Never do again & not good
Moderately good
Very good
One of the best in life
Immediately after
Six months after

FIGURE 3-3

Program Impact on Intellectual Development



Program Impact on Personal Development

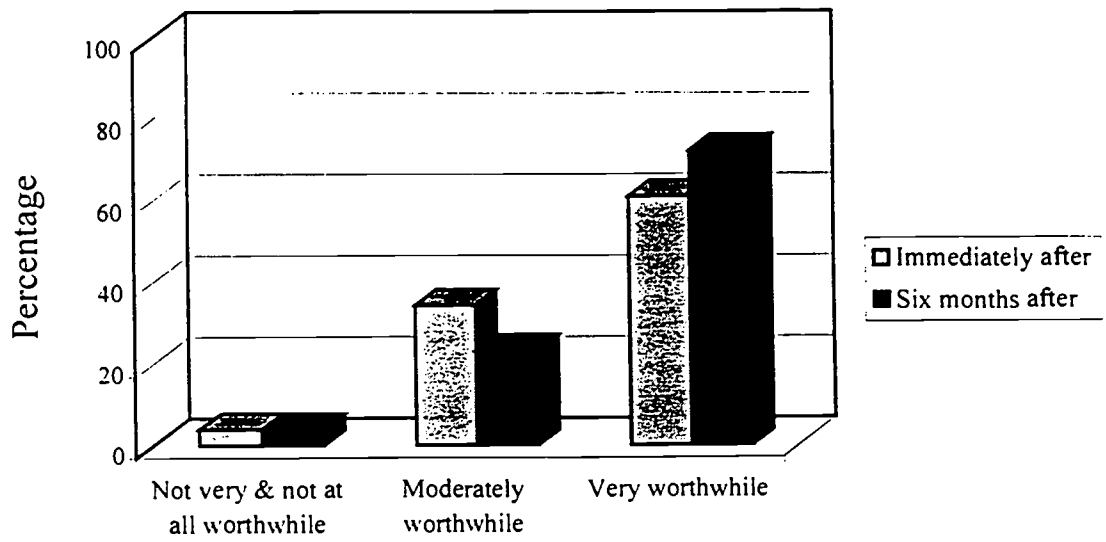
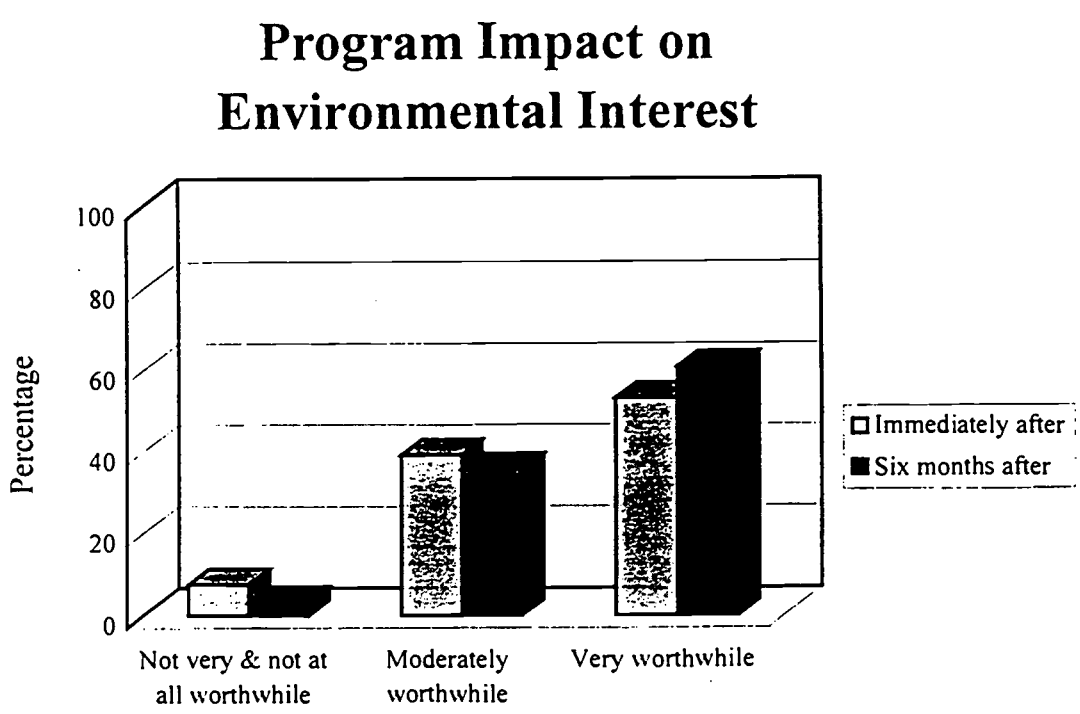


FIGURE 3-4


Program Impact on Environmental Interest
Percentage
100
80
60
40
20
0
Not very & not at all worthwhile
Moderately worthwhile
Very worthwhile
Immediately after
Six months after

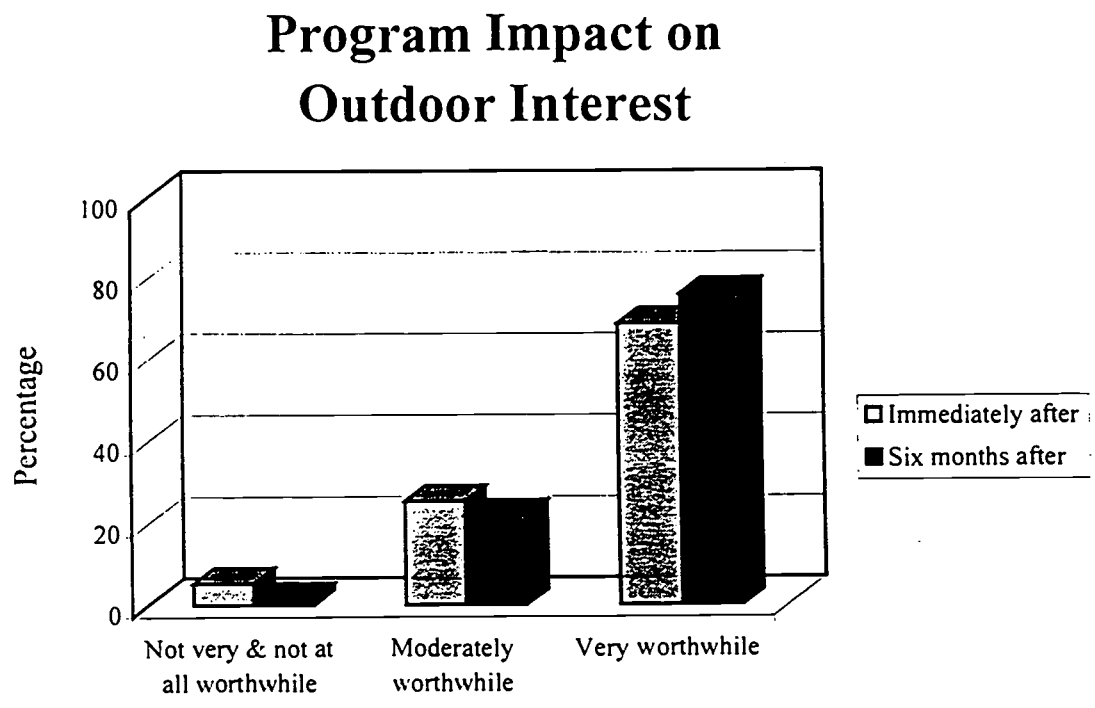

Program Impact on Outdoor Interest
Percentage
100
80
60
40
20
0
Not very & not at all worthwhile
Moderately worthwhile
Very worthwhile
Immediately after
Six months after

FIGURE 3-5

Overall Impact

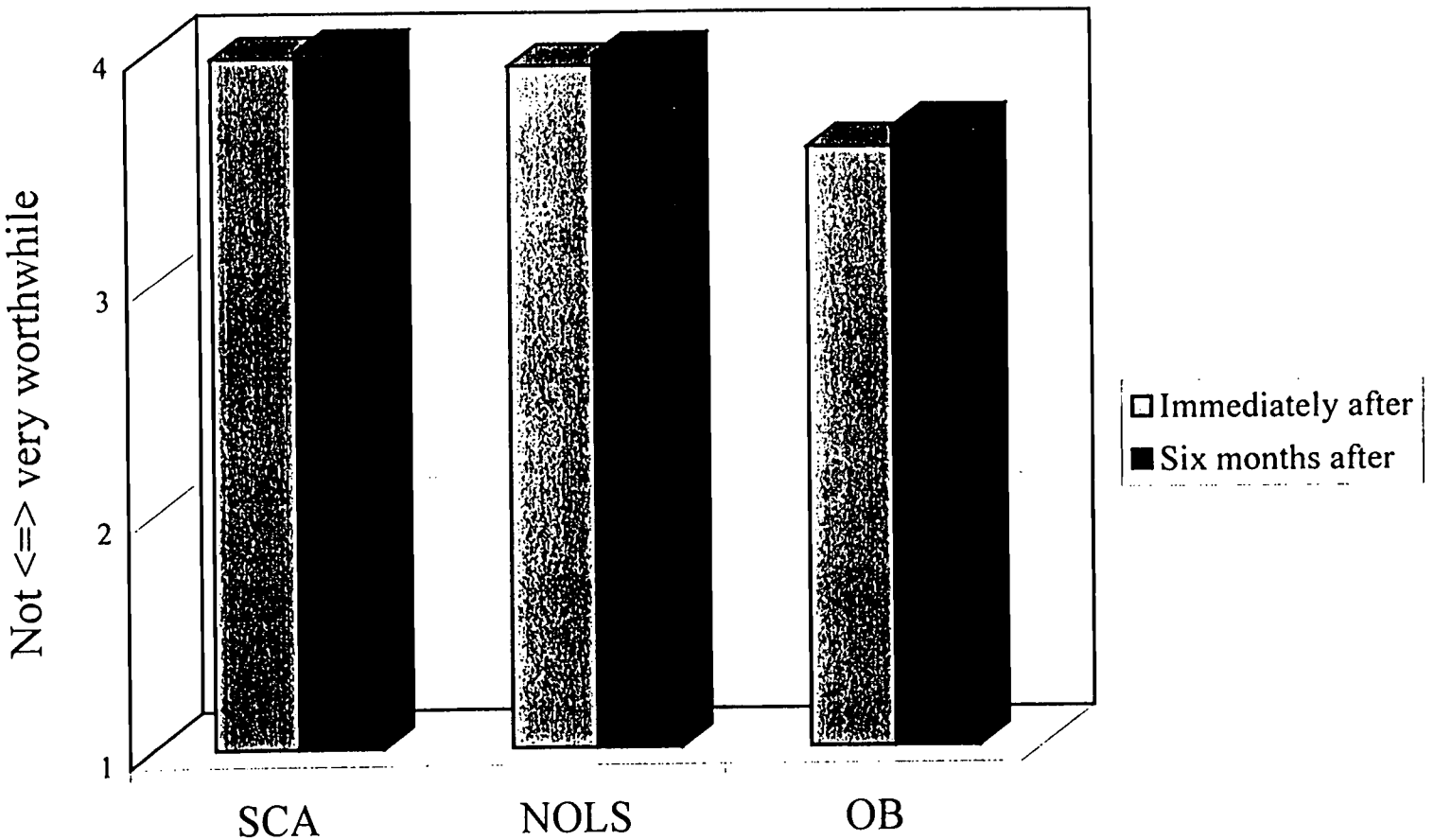


FIGURE 3-6

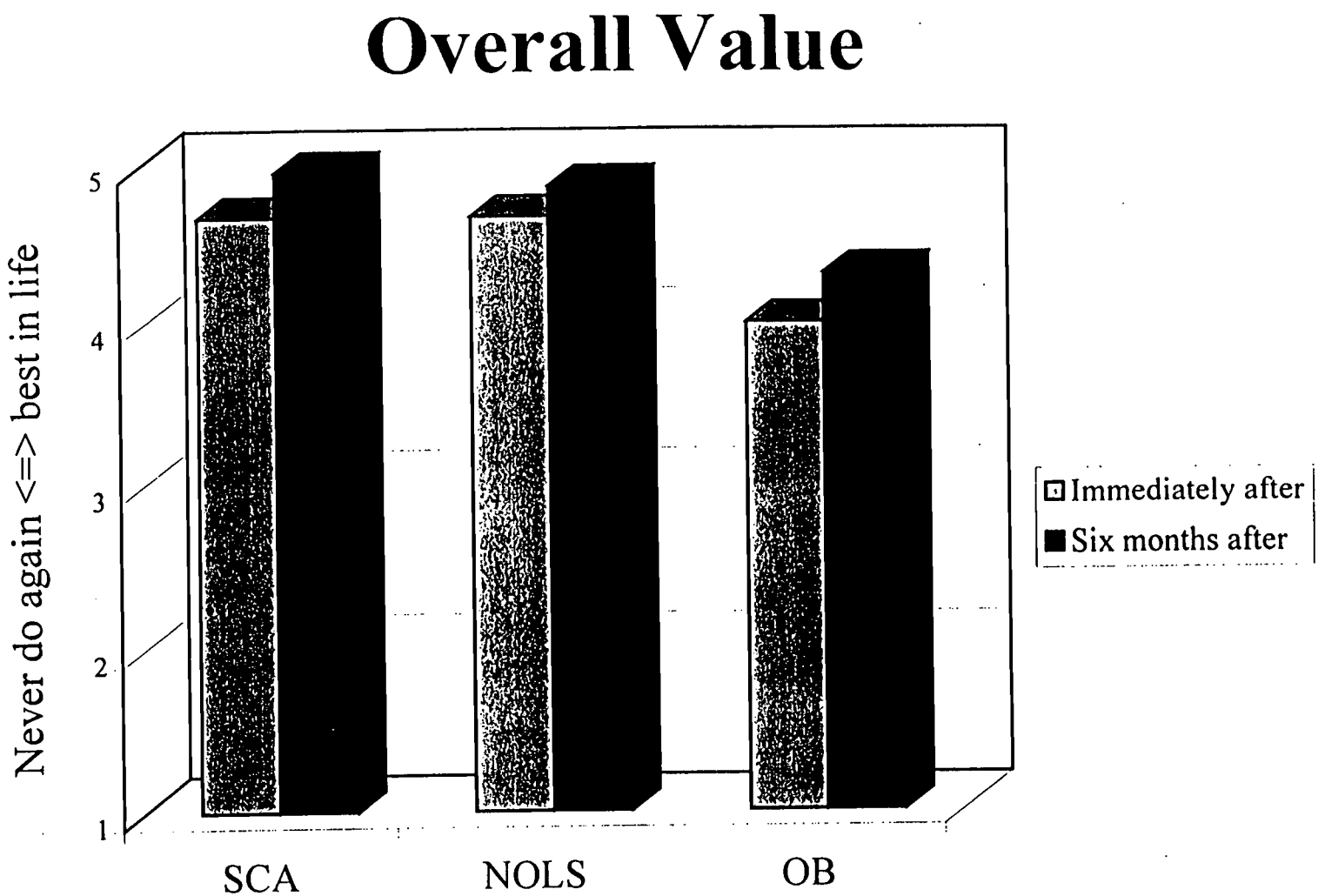
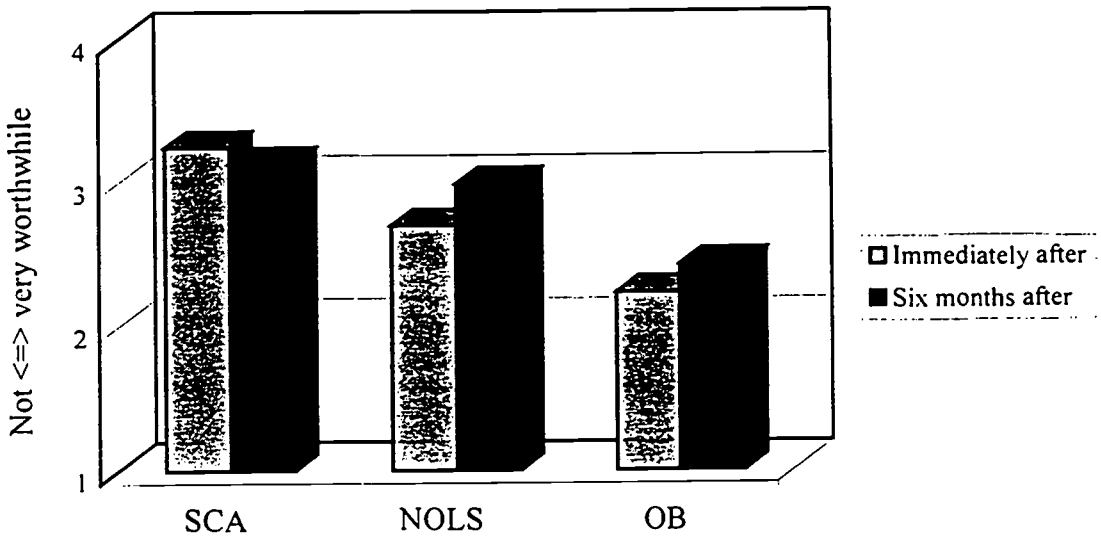

Overall Value
Never do again <=> best in life
5
4
3
2
1
SCA
NOLS
OB
Immediately after
Six months after

FIGURE 3-7

Program Impact on Career Choice



Program Impact on Community Service Interest

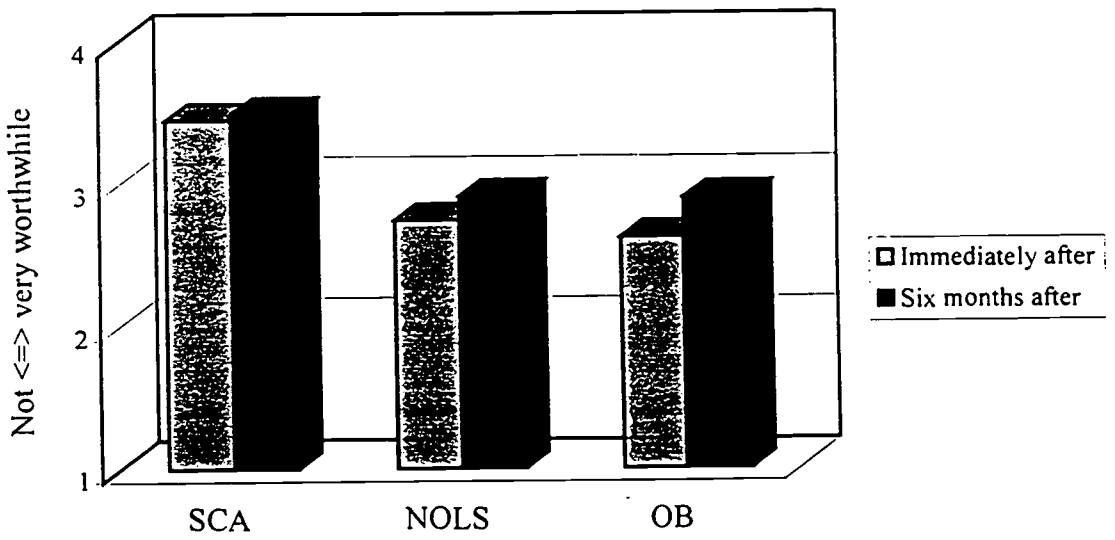
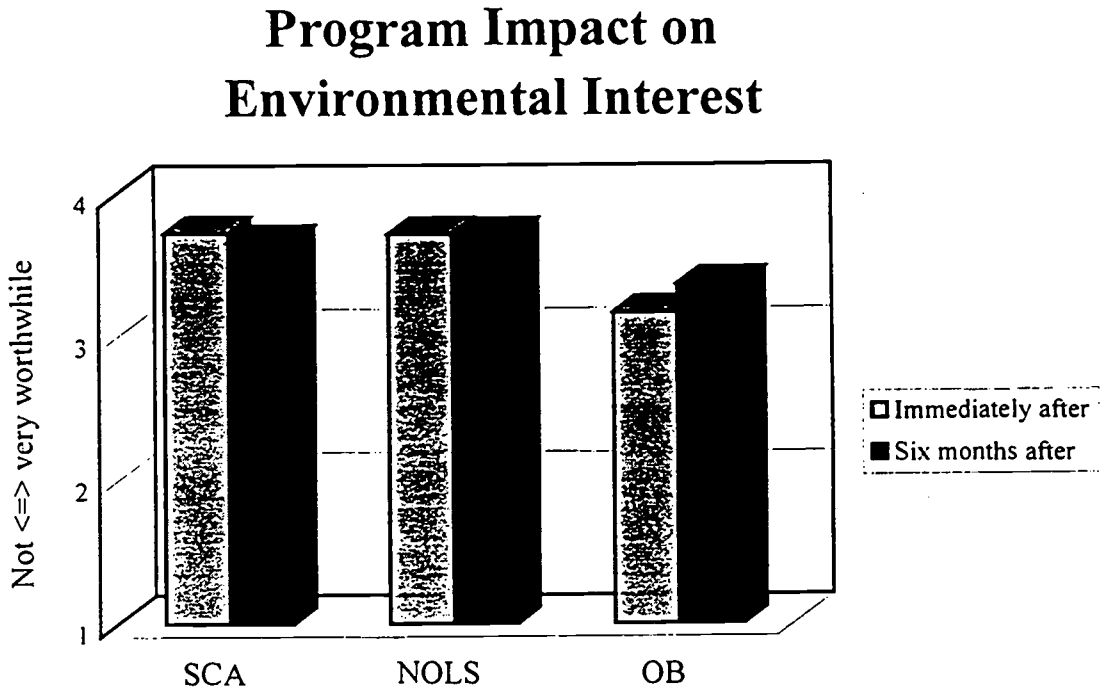


FIGURE 3-8


Program Impact on
Environmental Interest
Not <=> very worthwhile
4
3
2
1
SCA
NOLS
OB
Immediately after
Six months after

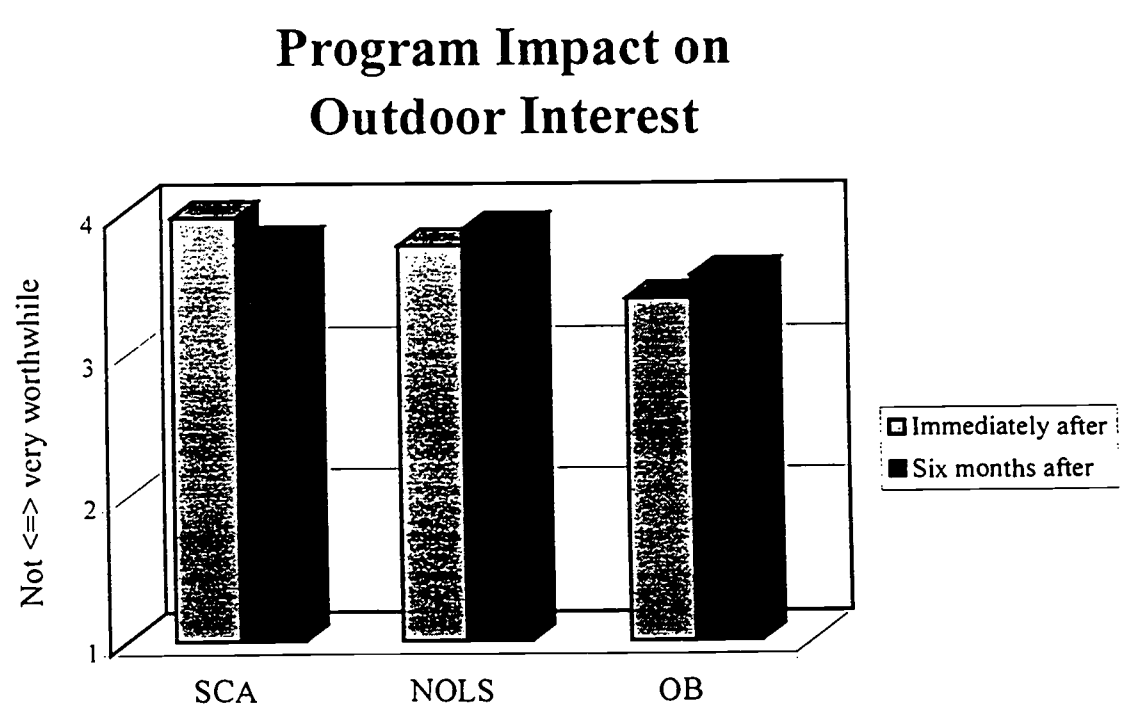
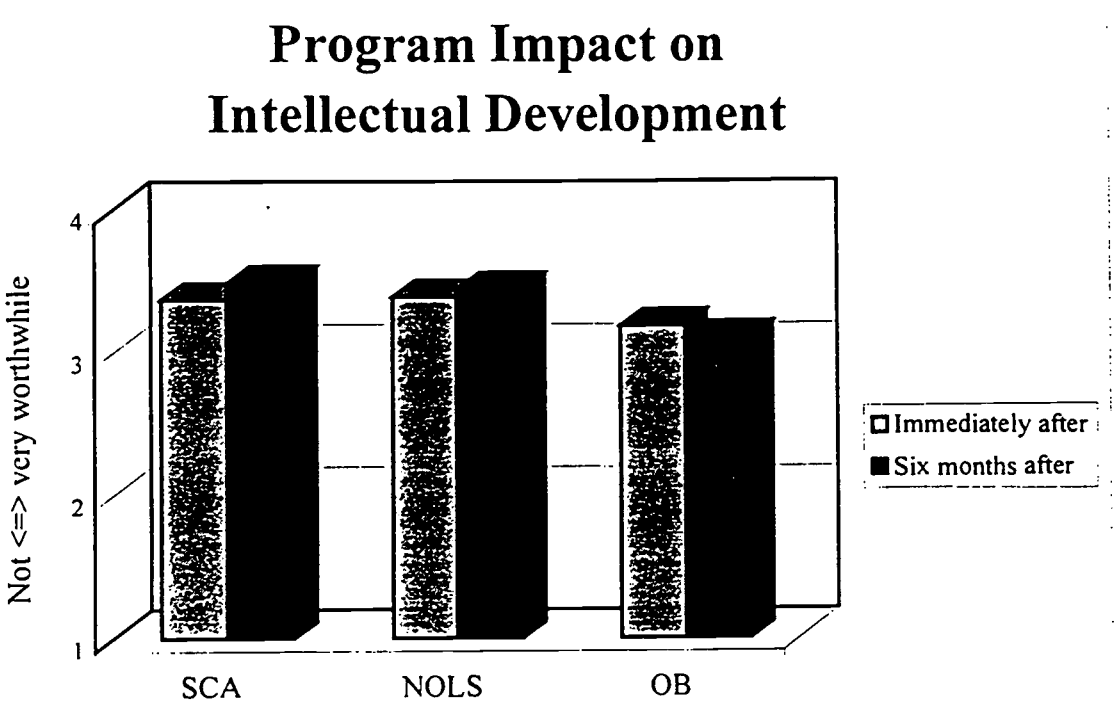

Program Impact on
Outdoor Interest
Not <=> very worthwhile
4
3
2
1
SCA
NOLS
OB
Immediately after
Six months after

FIGURE 3-9


Program Impact on
Intellectual Development
Not <=> very worthwhile
4
3
2
1
SCA
NOLS
OB
Immediately after
Six months after

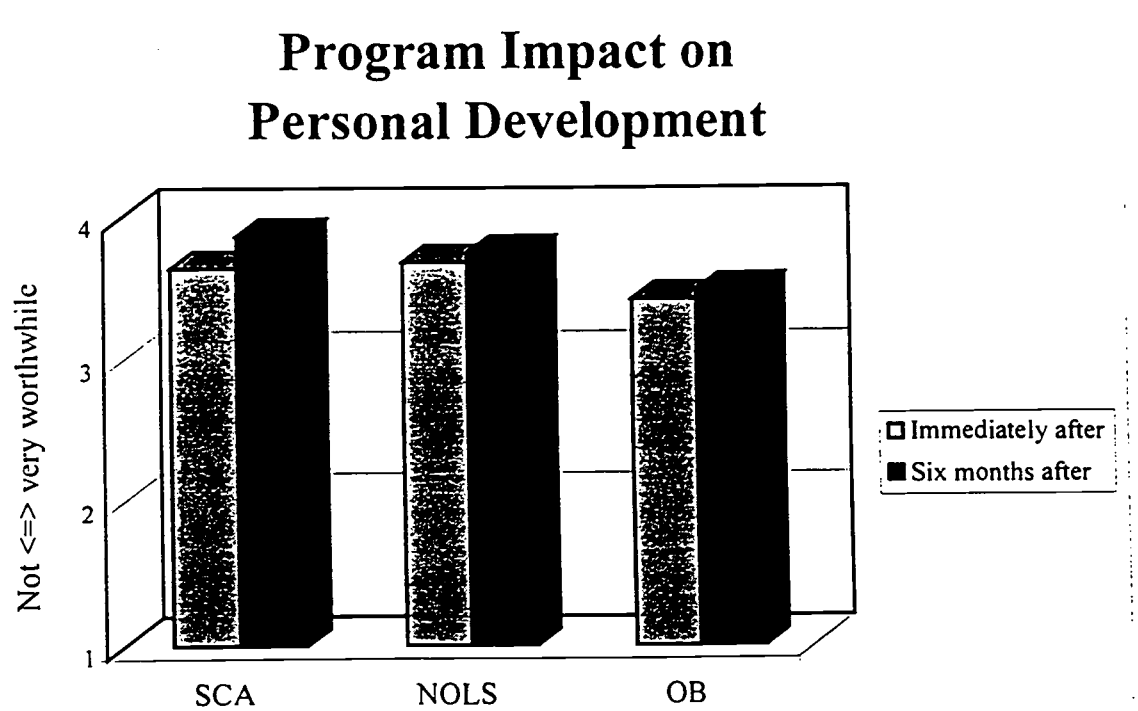
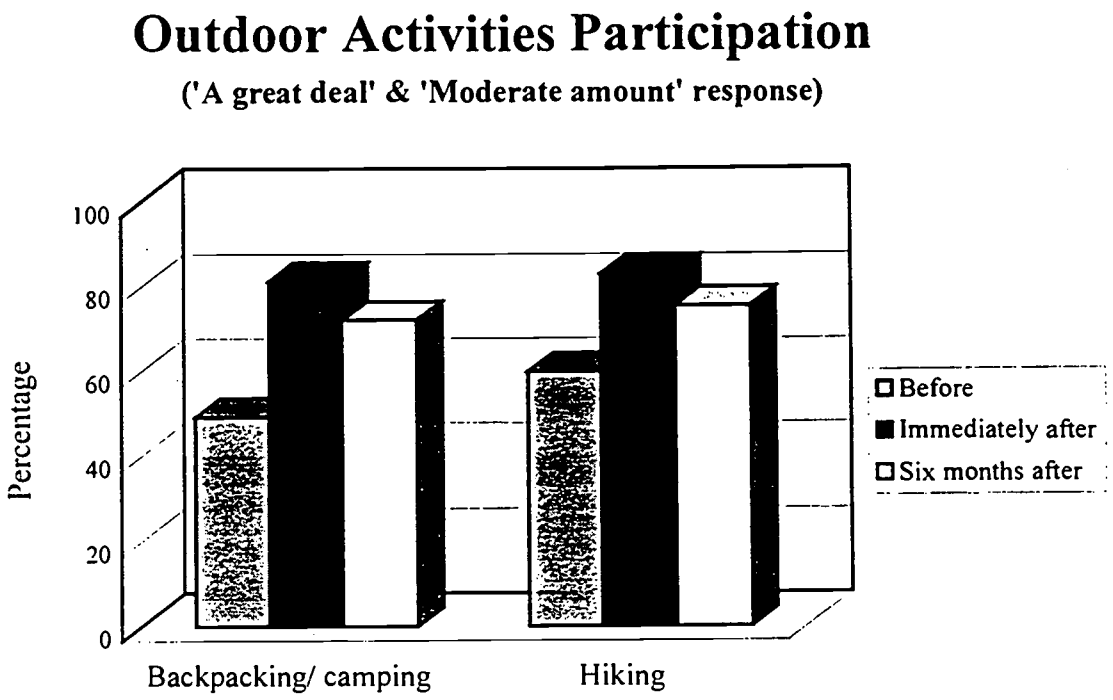

Program Impact on
Personal Development
Not <=> very worthwhile
4
3
2
1
SCA
NOLS
OB
Immediately after
Six months after

FIGURE 3-10


Outdoor Activities Participation
('A great deal' & 'Moderate amount' response)
Percentage
100
80
60
40
20
0
Backpacking/ camping
Hiking
Before
Immediately after
Six months after

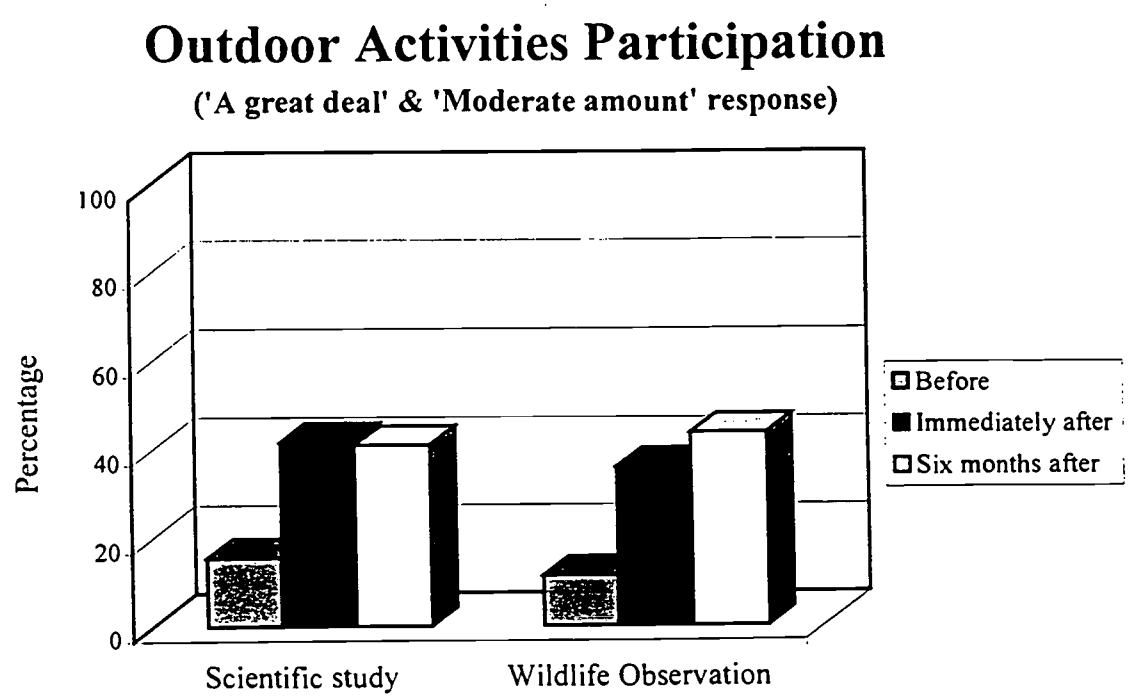

Outdoor Activities Participation
('A great deal' & 'Moderate amount' response)
Percentage
100
80
60
40
20
0
Scientific study
Wildlife Observation
Before
Immediately after
Six months after

FIGURE 3-11

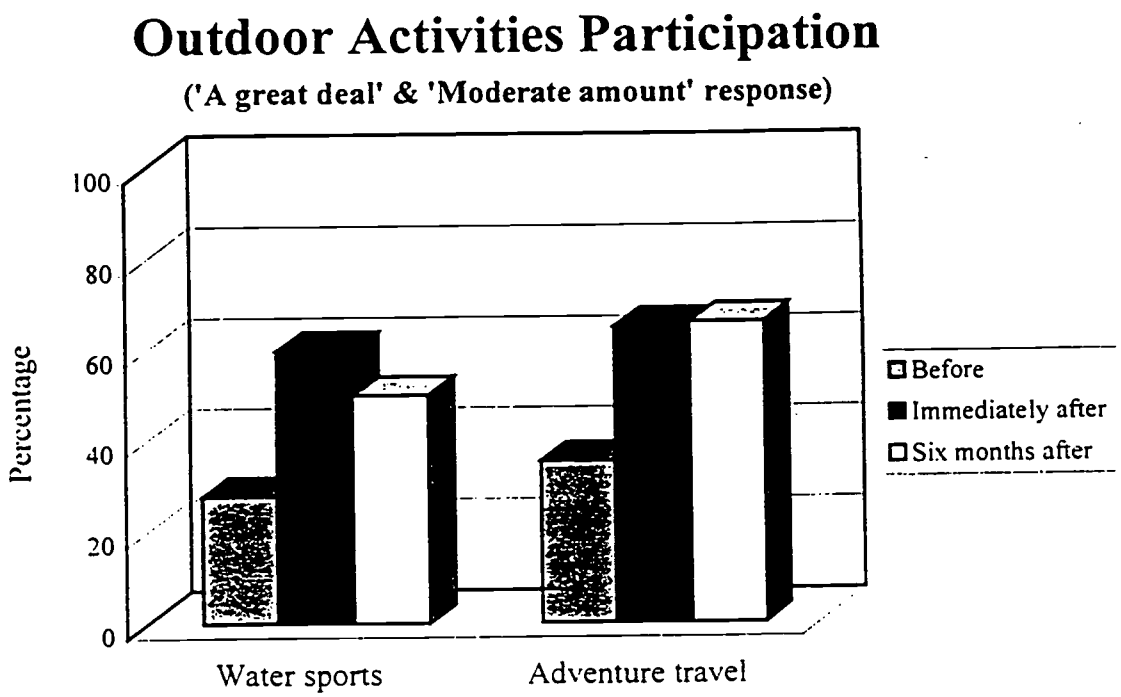
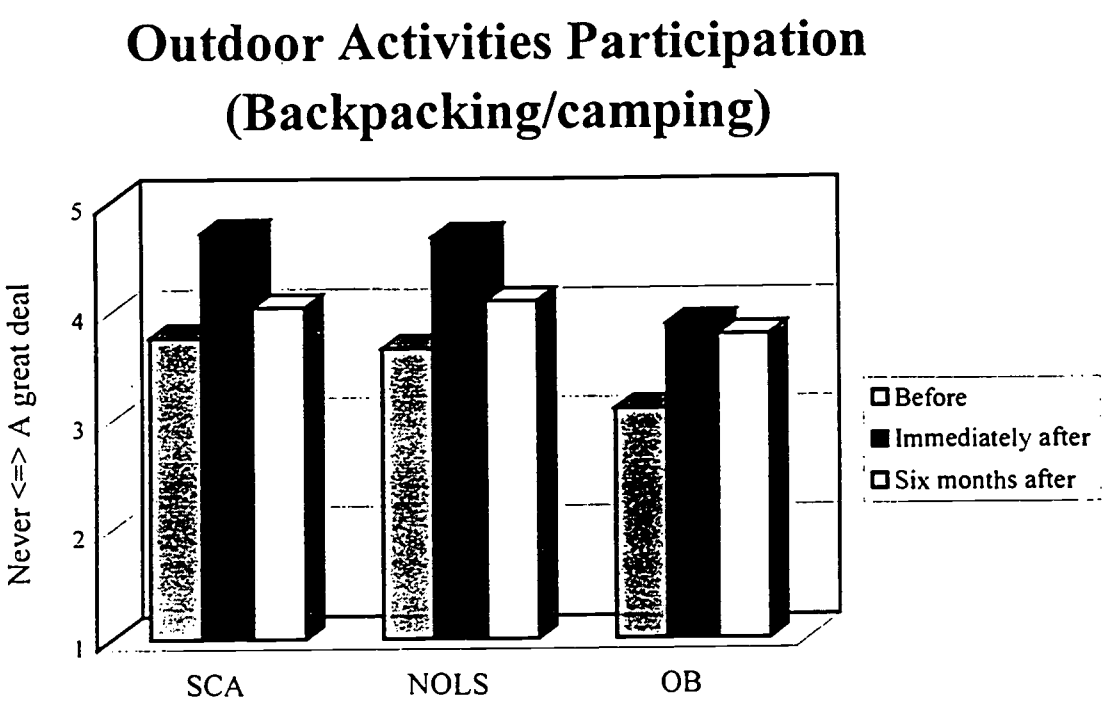

Outdoor Activities Participation
('A great deal' & 'Moderate amount' response)
Percentage
100
80
60
40
20
0
Water sports
Adventure travel
Before
Immediately after
Six months after

FIGURE 3-12



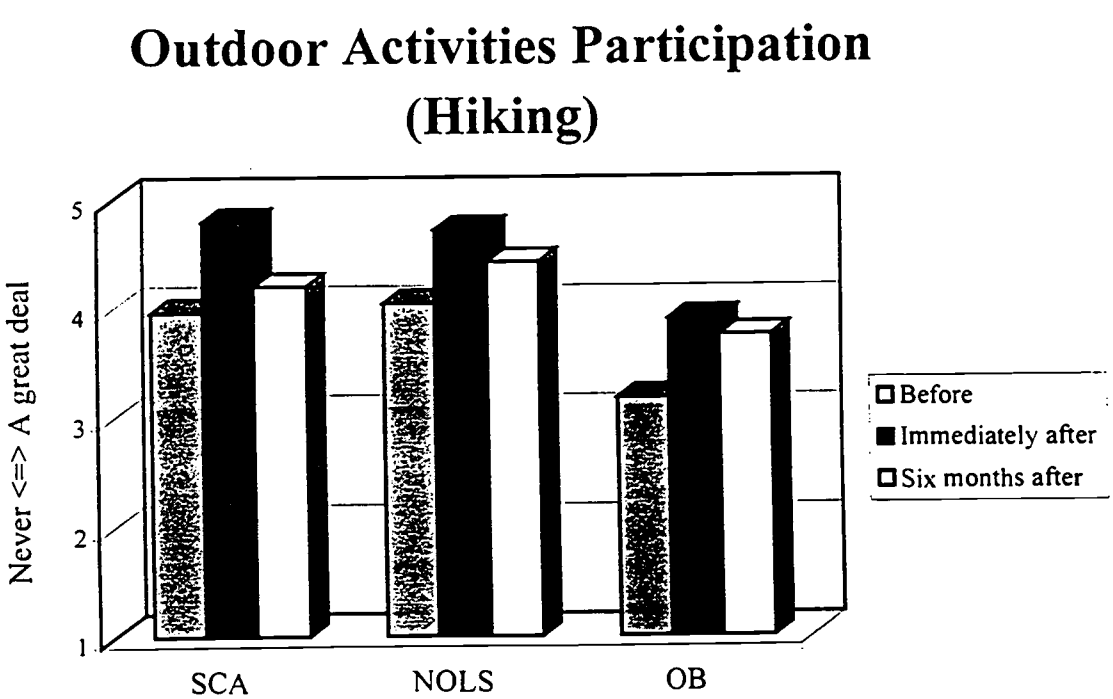
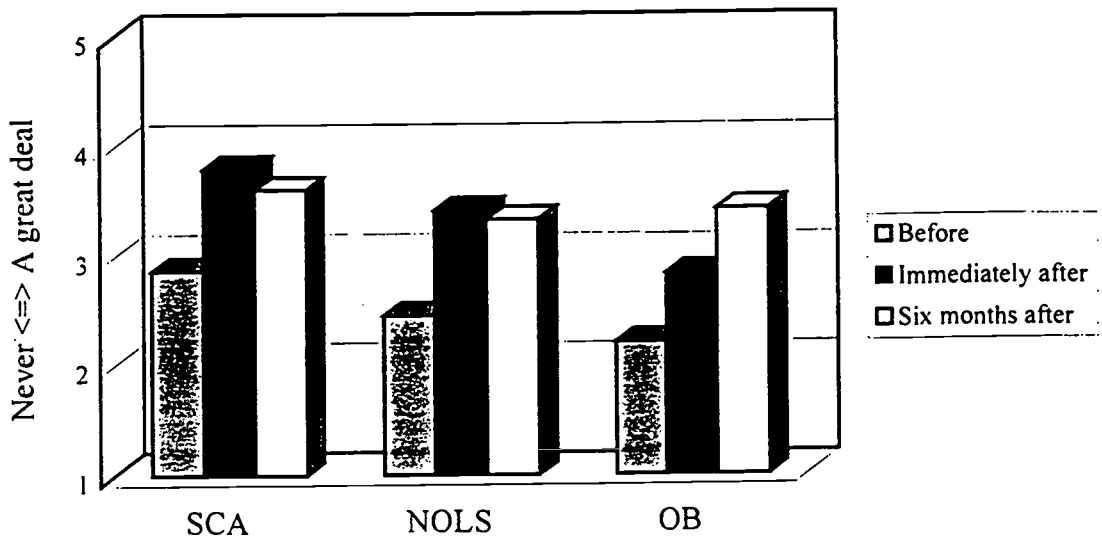


FIGURE 3-13

Outdoor Activities Participation (Scientific Study)



Outdoor Activities Participation (Wildlife Observation)

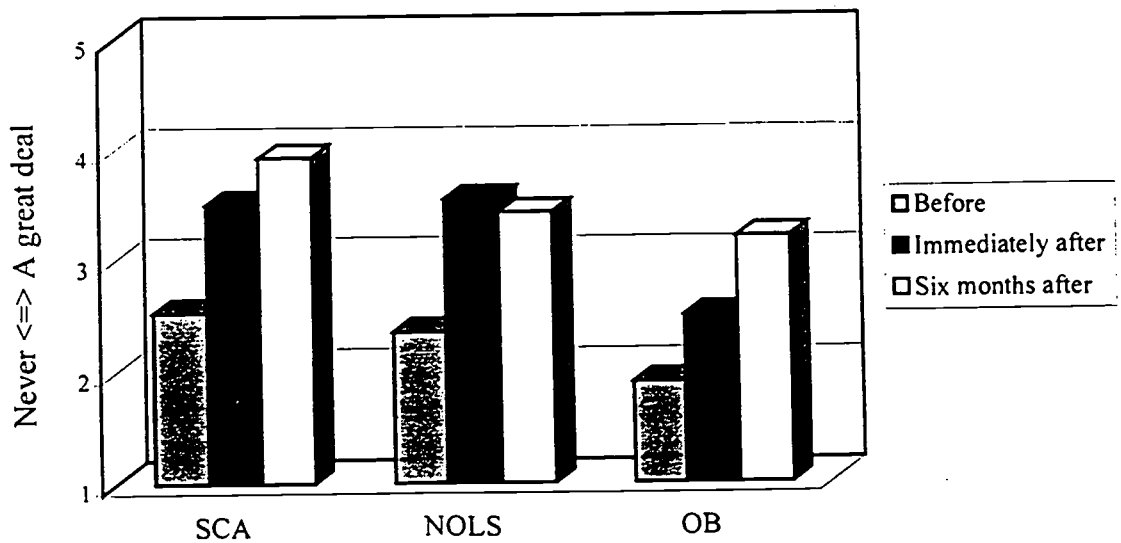
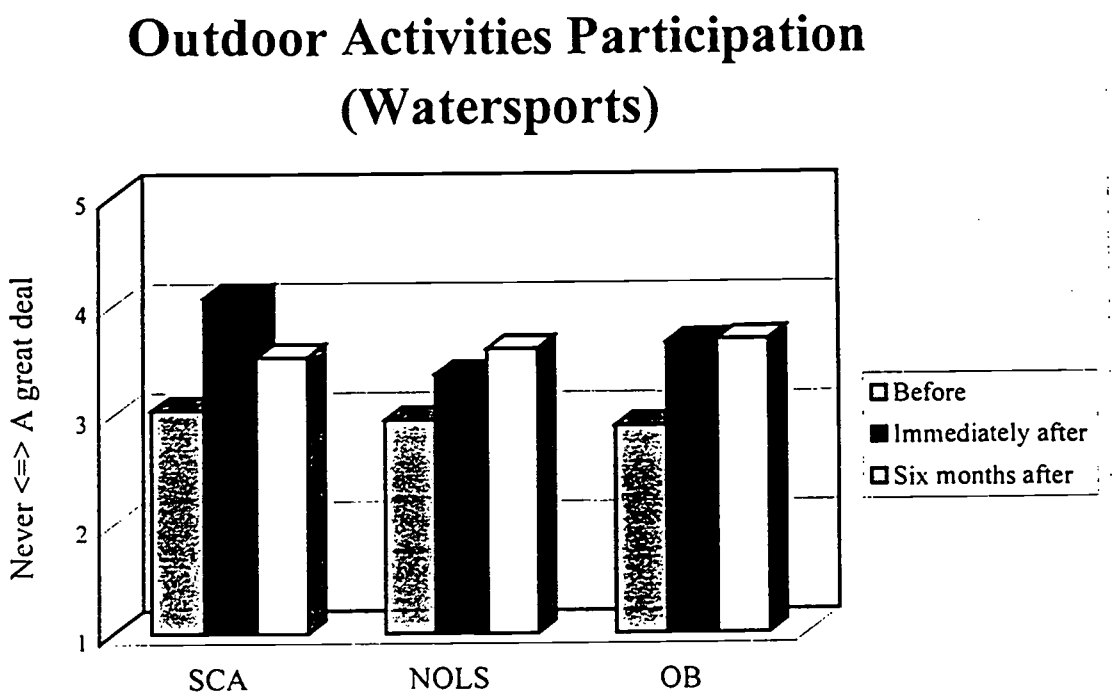


FIGURE 3-14


Outdoor Activities Participation
(Watersports)
Never <=> A great deal
5
4
3
2
1
SCA
NOLS
OB
Before
Immediately after
Six months after

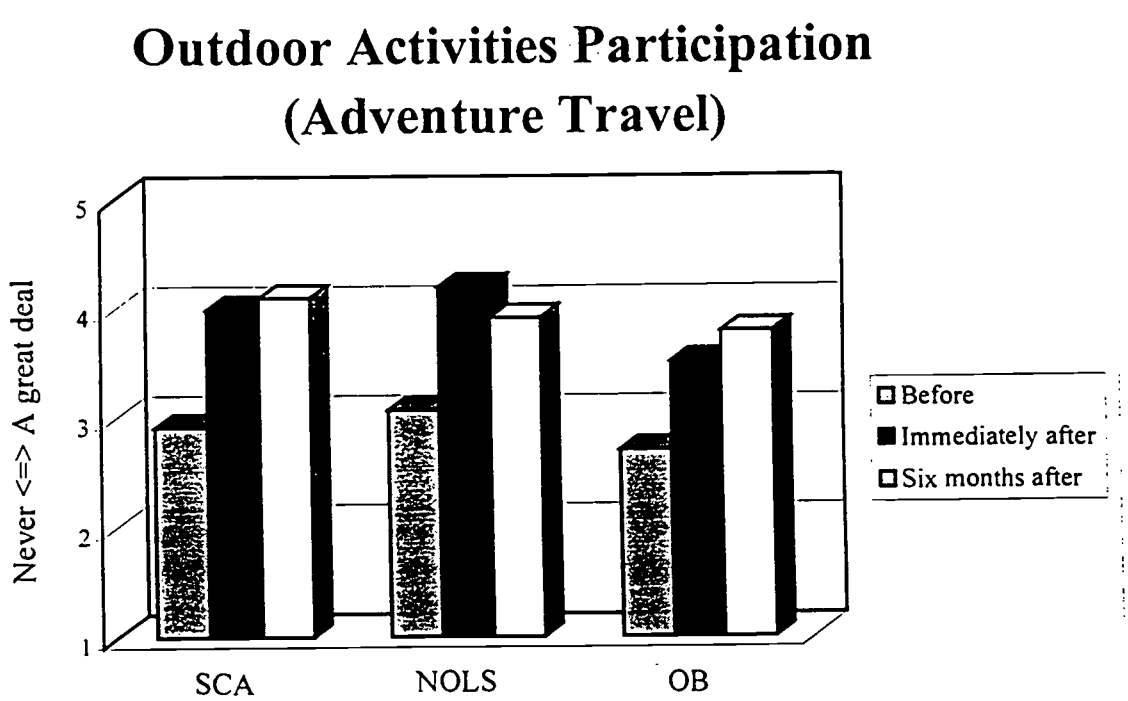
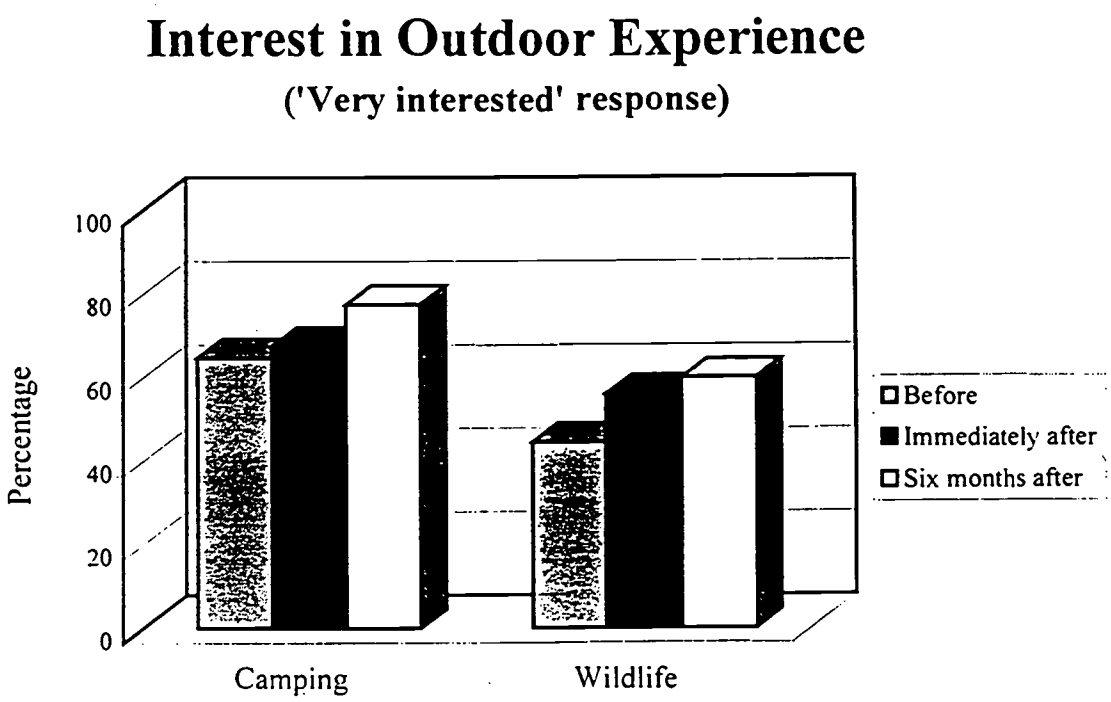

Outdoor Activities Participation
(Adventure Travel)
Never <=> A great deal
5
4
3
2
1
SCA
NOLS
OB
Before
Immediately after
Six months after

FIGURE 3-15


Interest in Outdoor Experience
('Very interested' response)
Percentage
100
80
60
40
20
0
Camping
Wildlife
Before
Immediately after
Six months after

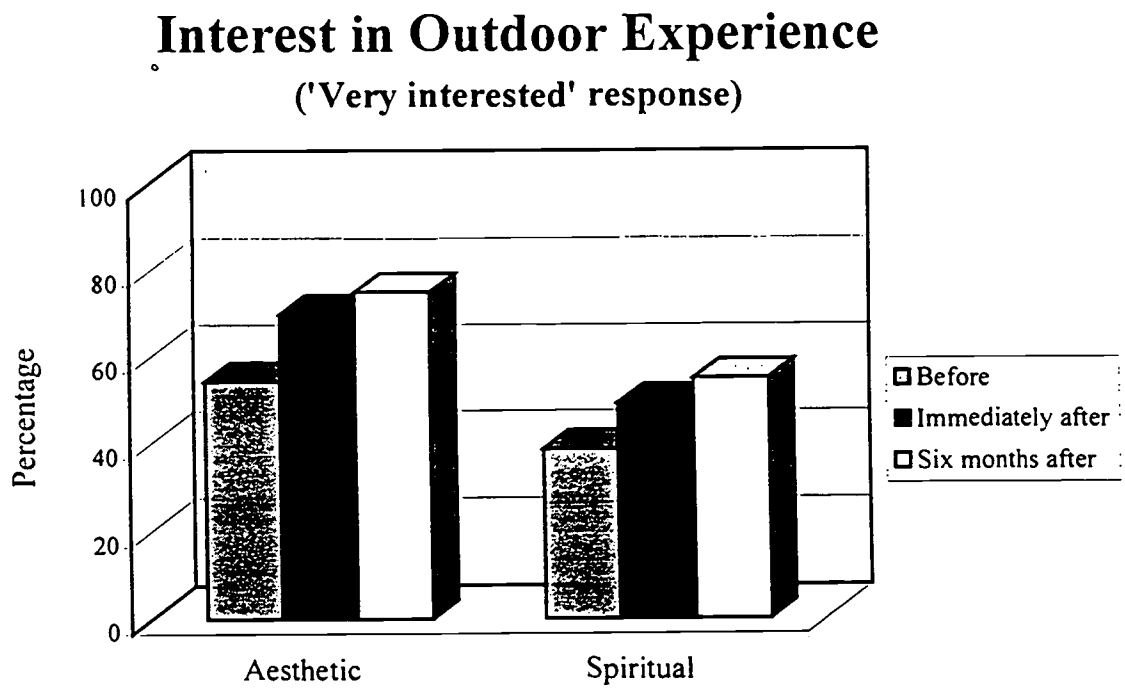

Interest in Outdoor Experience
('Very interested' response)
Percentage
100
80
60
40
20
0
Aesthetic
Spiritual
Before
Immediately after
Six months after

FIGURE 3-16

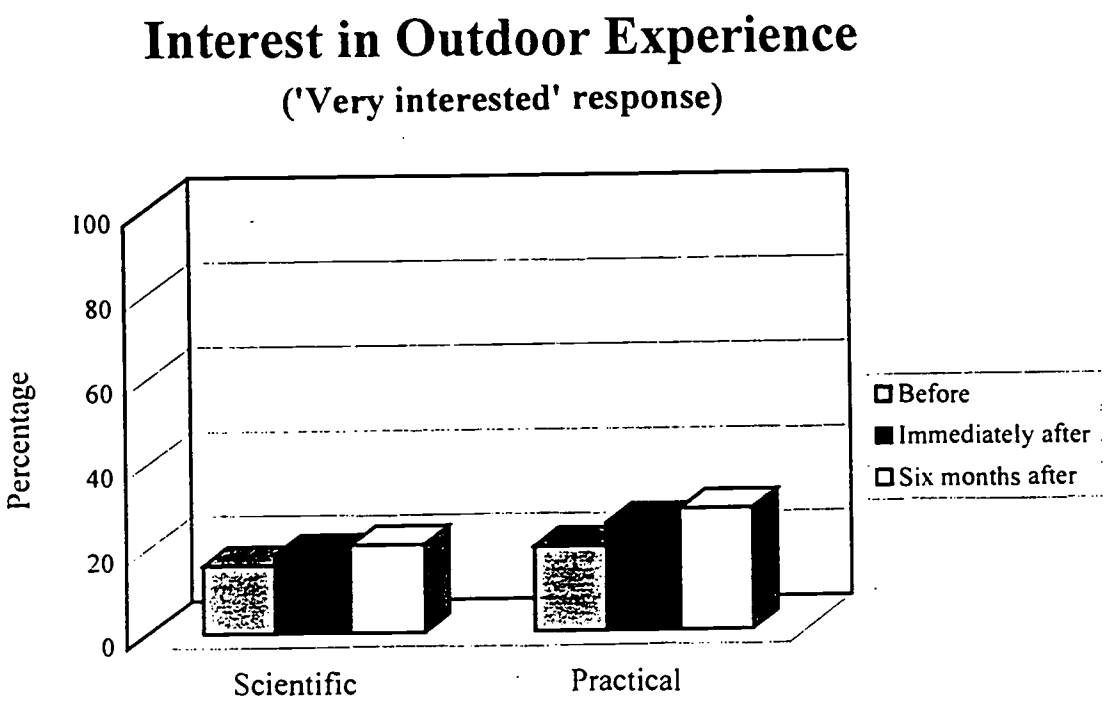
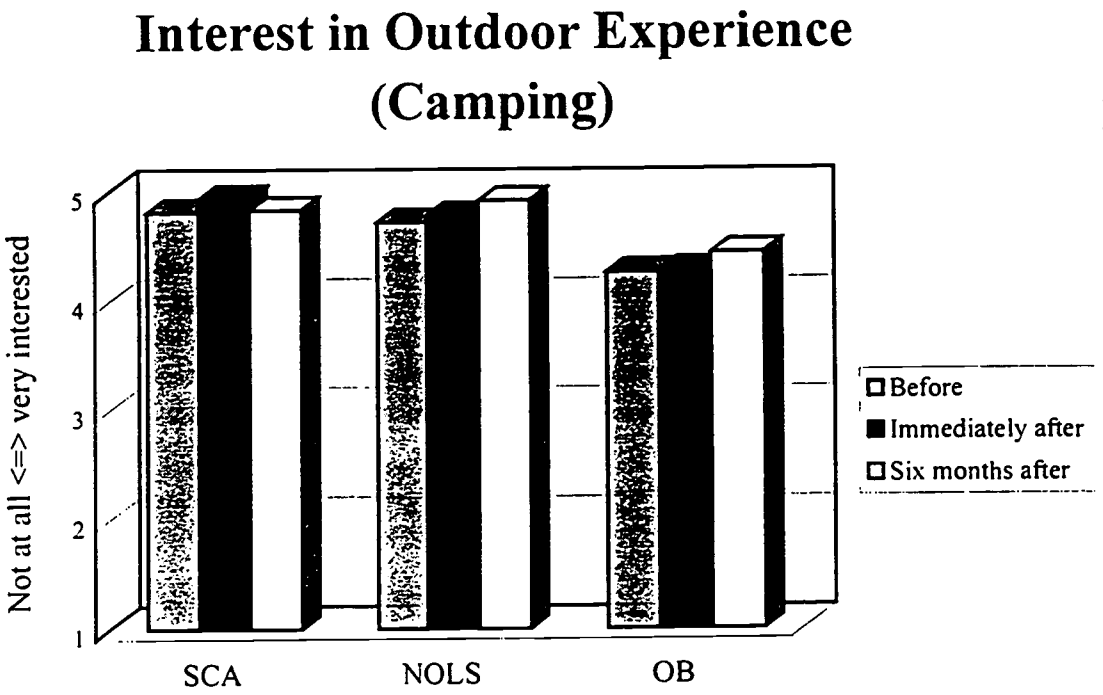

Interest in Outdoor Experience
('Very interested' response)
Percentage
100
80
60
40
20
0
Scientific
Practical
Before
Immediately after
Six months after

FIGURE 3-17


Interest in Outdoor Experience
(Camping)
Not at all <=> very interested
5
4
3
2
1
SCA
NOLS
OB
Before
Immediately after
Six months after

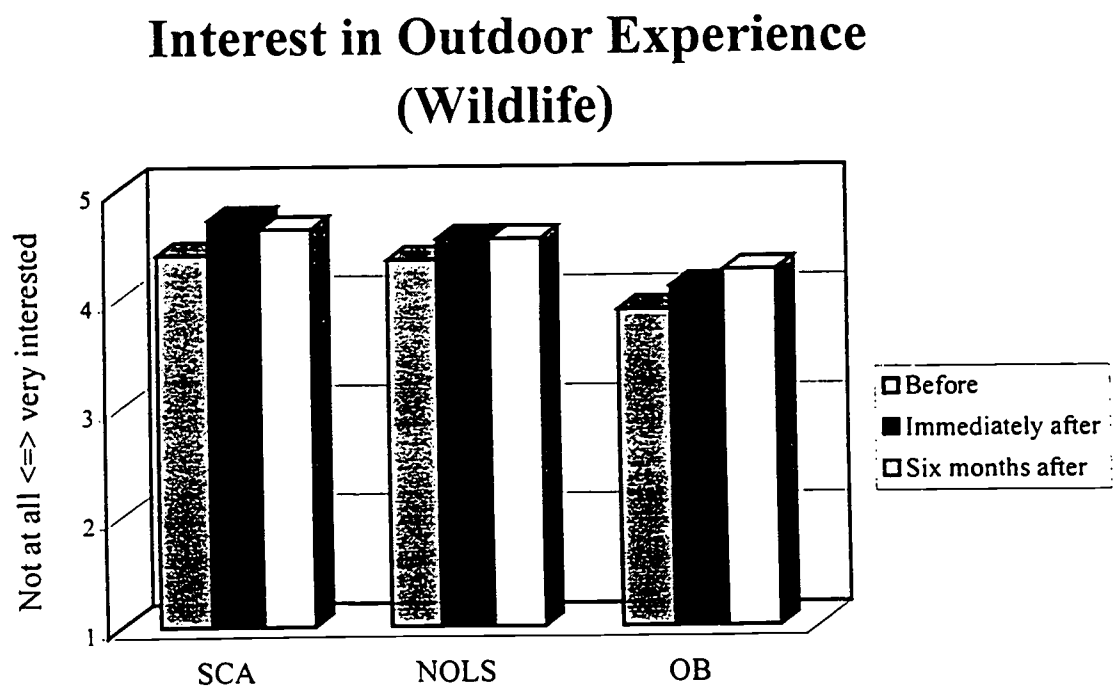
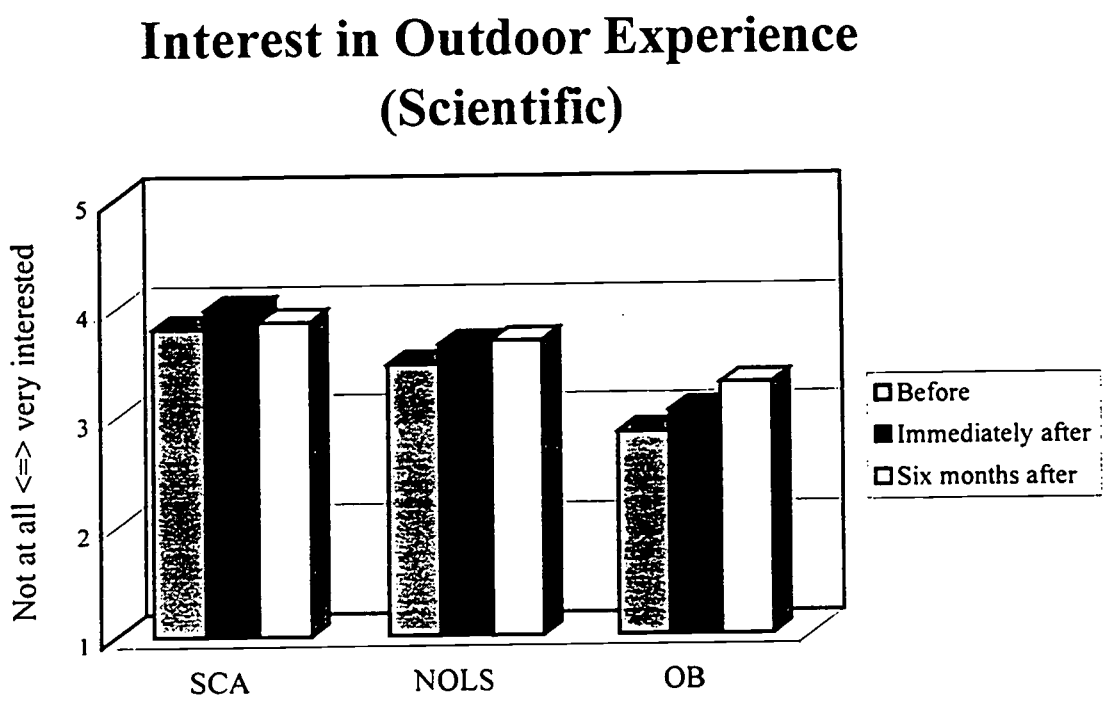

Interest in Outdoor Experience
(Wildlife)
Not at all <=> very interested
5
4
3
2
1
SCA
NOLS
OB
Before
Immediately after
Six months after

FIGURE 3-18


Interest in Outdoor Experience
(Scientific)
Not at all <=> very interested
5
4
3
2
1
SCA
NOLS
OB
Before
Immediately after
Six months after

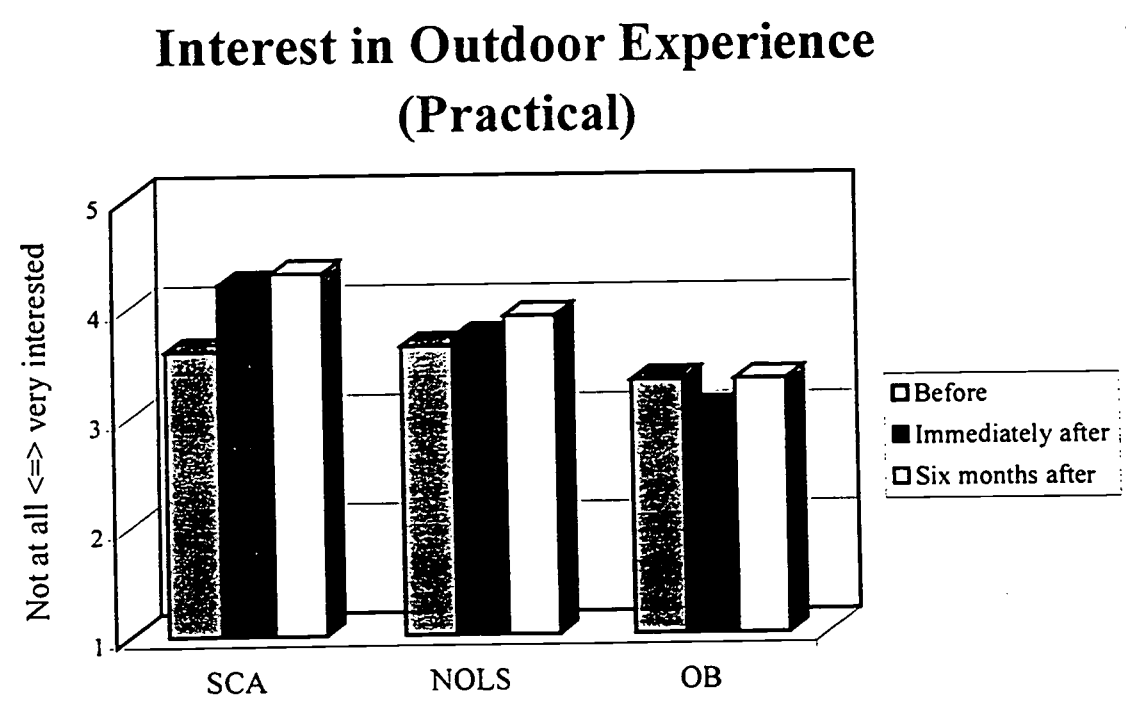
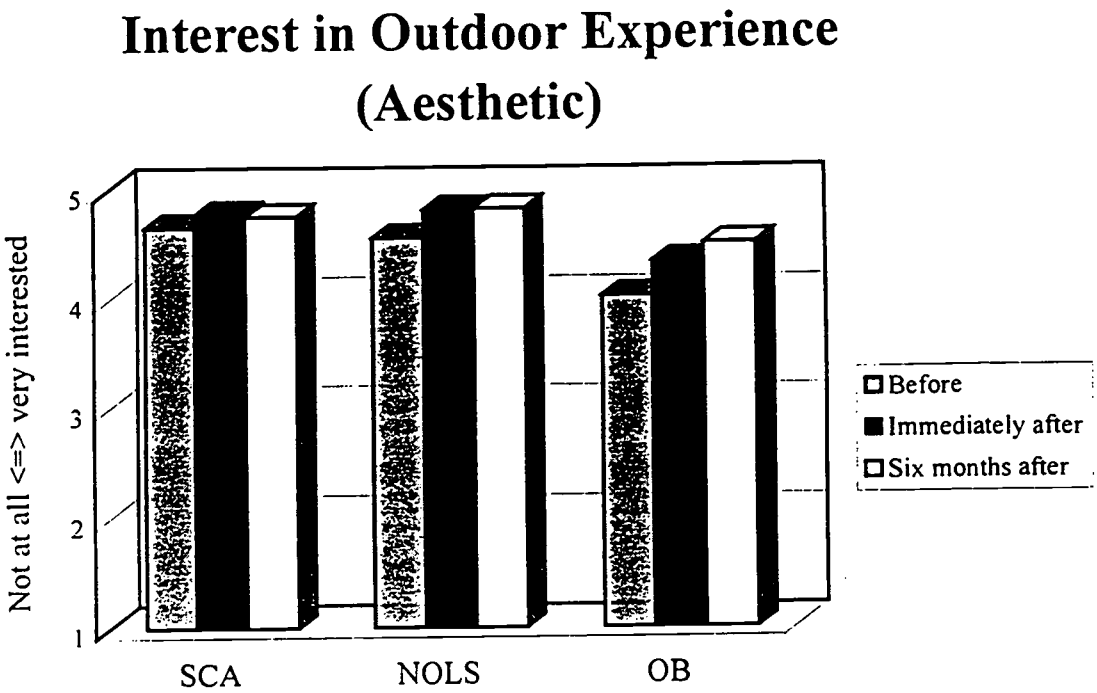

Interest in Outdoor Experience
(Practical)
Not at all <=> very interested
5
4
3
2
1
SCA
NOLS
OB
Before
Immediately after
Six months after

FIGURE 3-19


Interest in Outdoor Experience
(Aesthetic)
Not at all <=> very interested
5
4
3
2
1
SCA
NOLS
OB
Before
Immediately after
Six months after

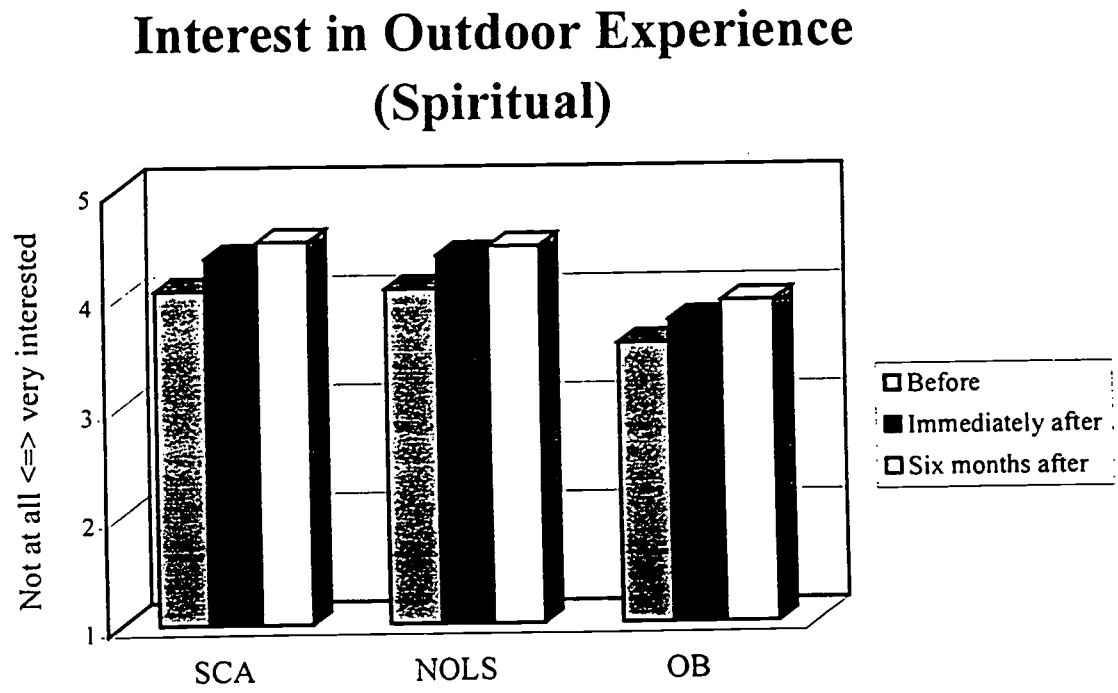
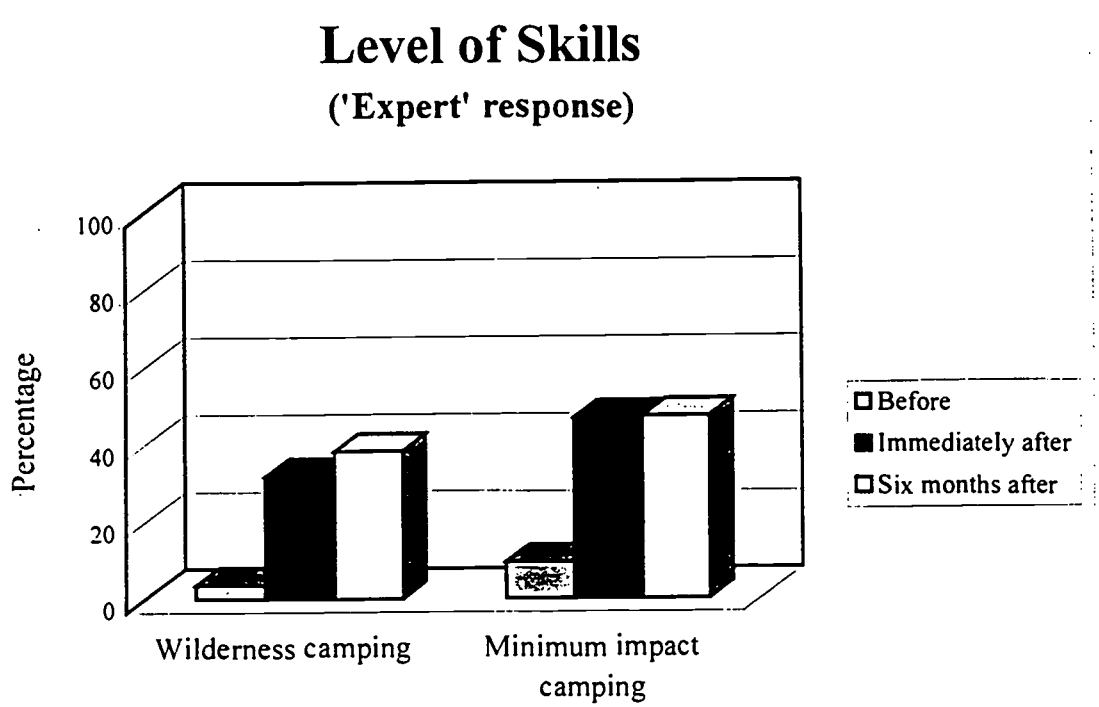

Interest in Outdoor Experience
(Spiritual)
Not at all <=> very interested
5
4
3
2
1
SCA
NOLS
OB
Before
Immediately after
Six months after

FIGURE 3-20


Level of Skills
('Expert' response)
Percentage
100
80
60
40
20
0
Wilderness camping
Minimum impact camping
Before
Immediately after
Six months after

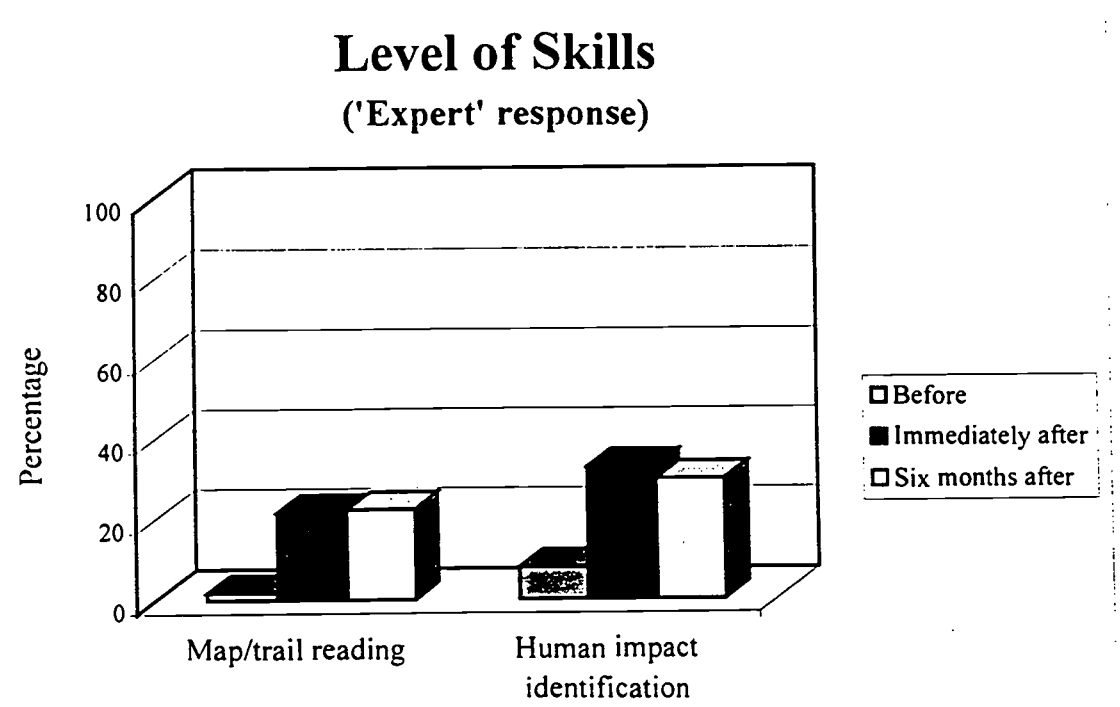
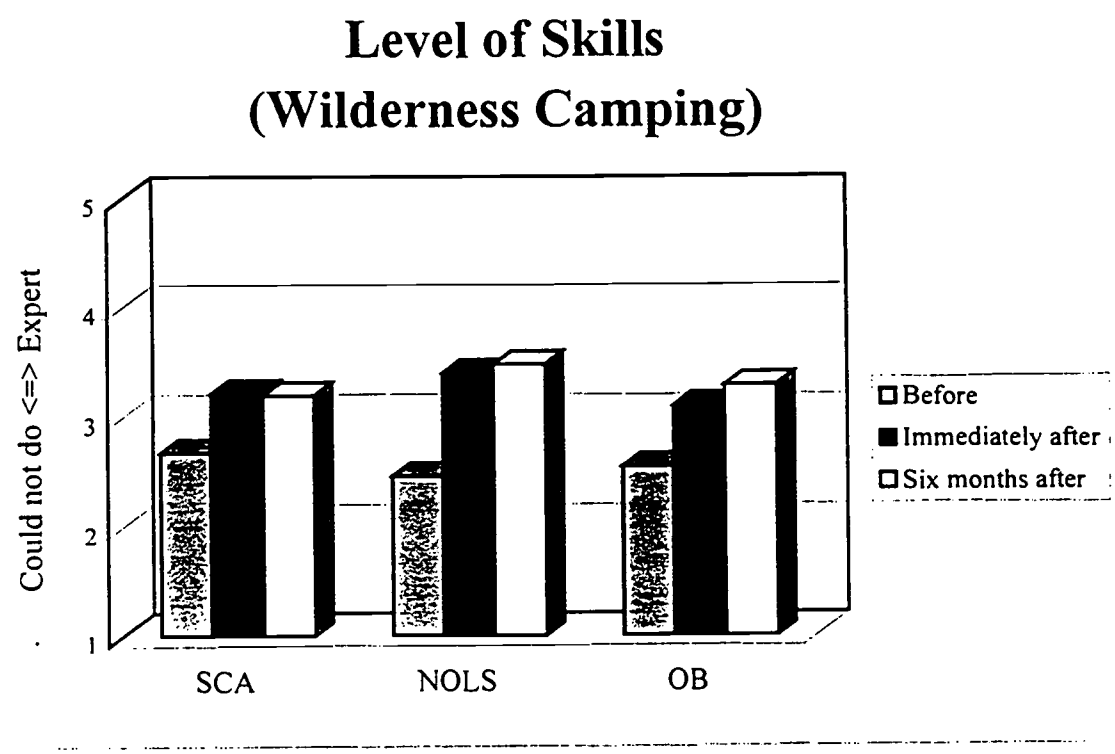

Level of Skills
('Expert' response)
Percentage
100
80
60
40
20
0
Map/trail reading
Human impact identification
Before
Immediately after
Six months after

FIGURE 3-21


Level of Skills
(Wilderness Camping)
Could not do <=> Expert
5
4
3
2
1
SCA
NOLS
OB
Before
Immediately after
Six months after

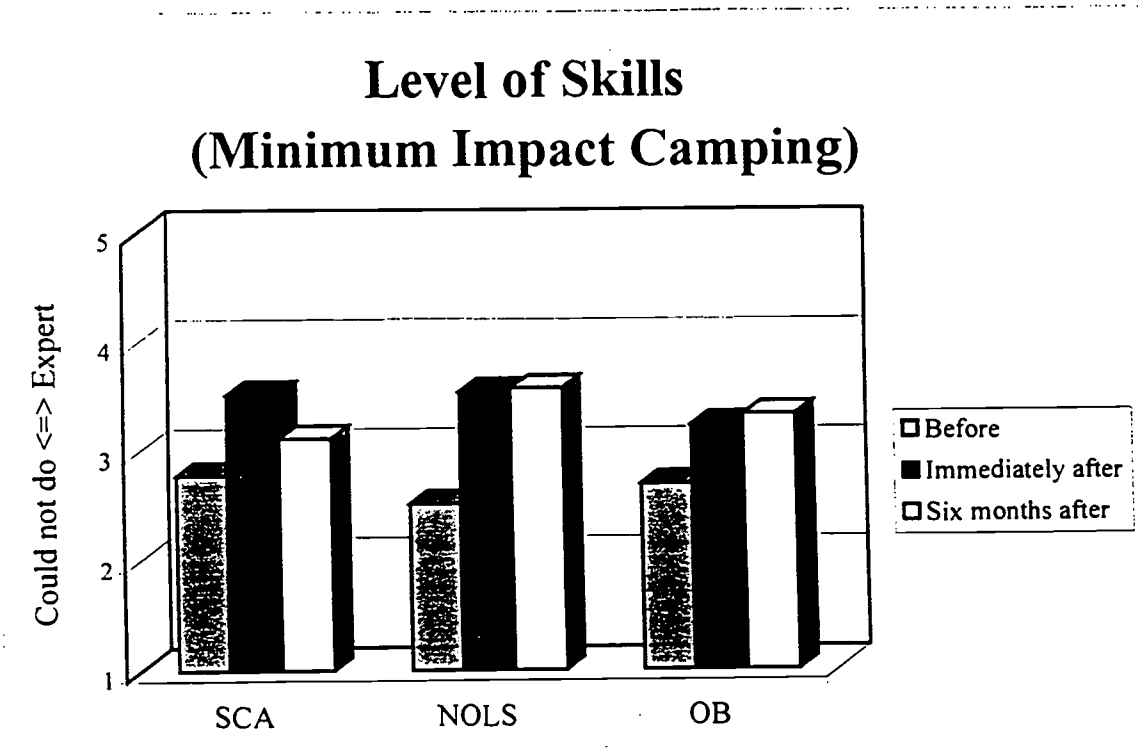
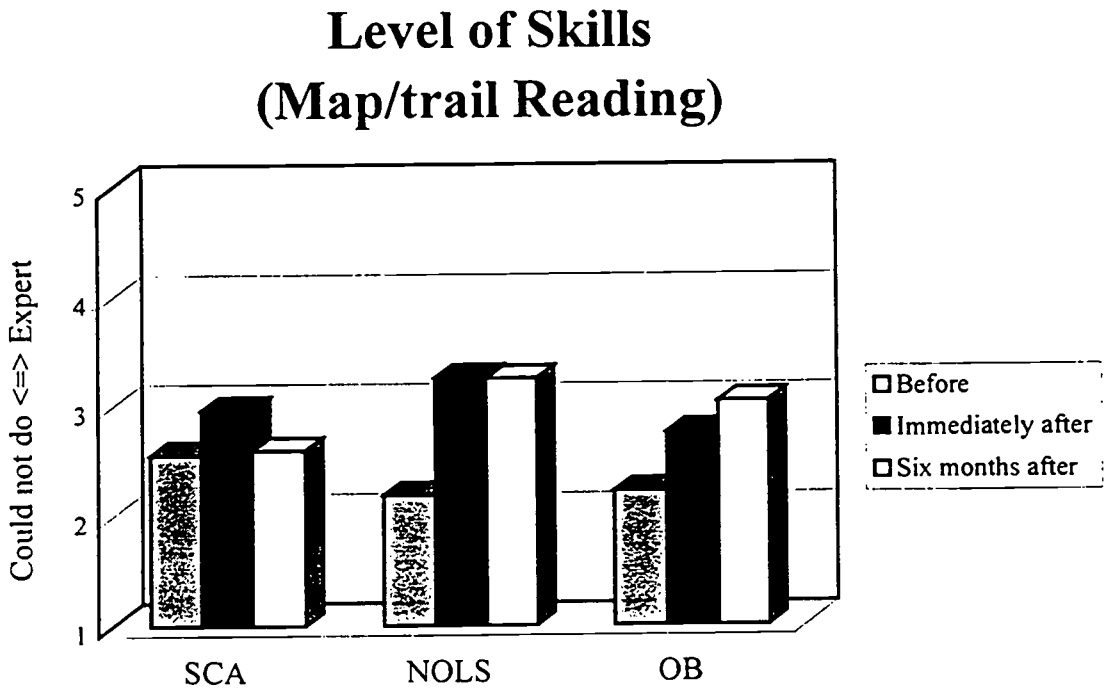

Level of Skills
(Minimum Impact Camping)
Could not do <=> Expert
5
4
3
2
1
SCA
NOLS
OB
Before
Immediately after
Six months after

FIGURE 3-22


Level of Skills
(Map/trail Reading)
Could not do <=> Expert
5
4
3
2
1
SCA
NOLS
OB
Before
Immediately after
Six months after

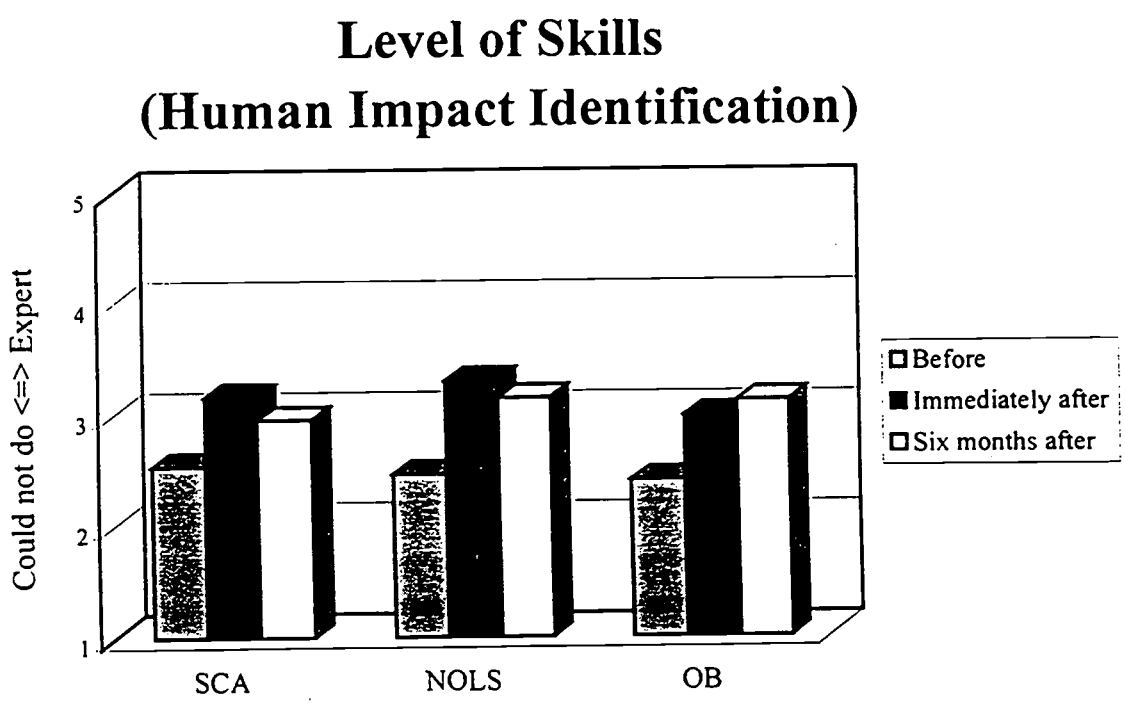

Level of Skills
(Human Impact Identification)
Could not do <=> Expert
5
4
3
2
1
SCA
NOLS
OB
Before
Immediately after
Six months after

FIGURE 3--23

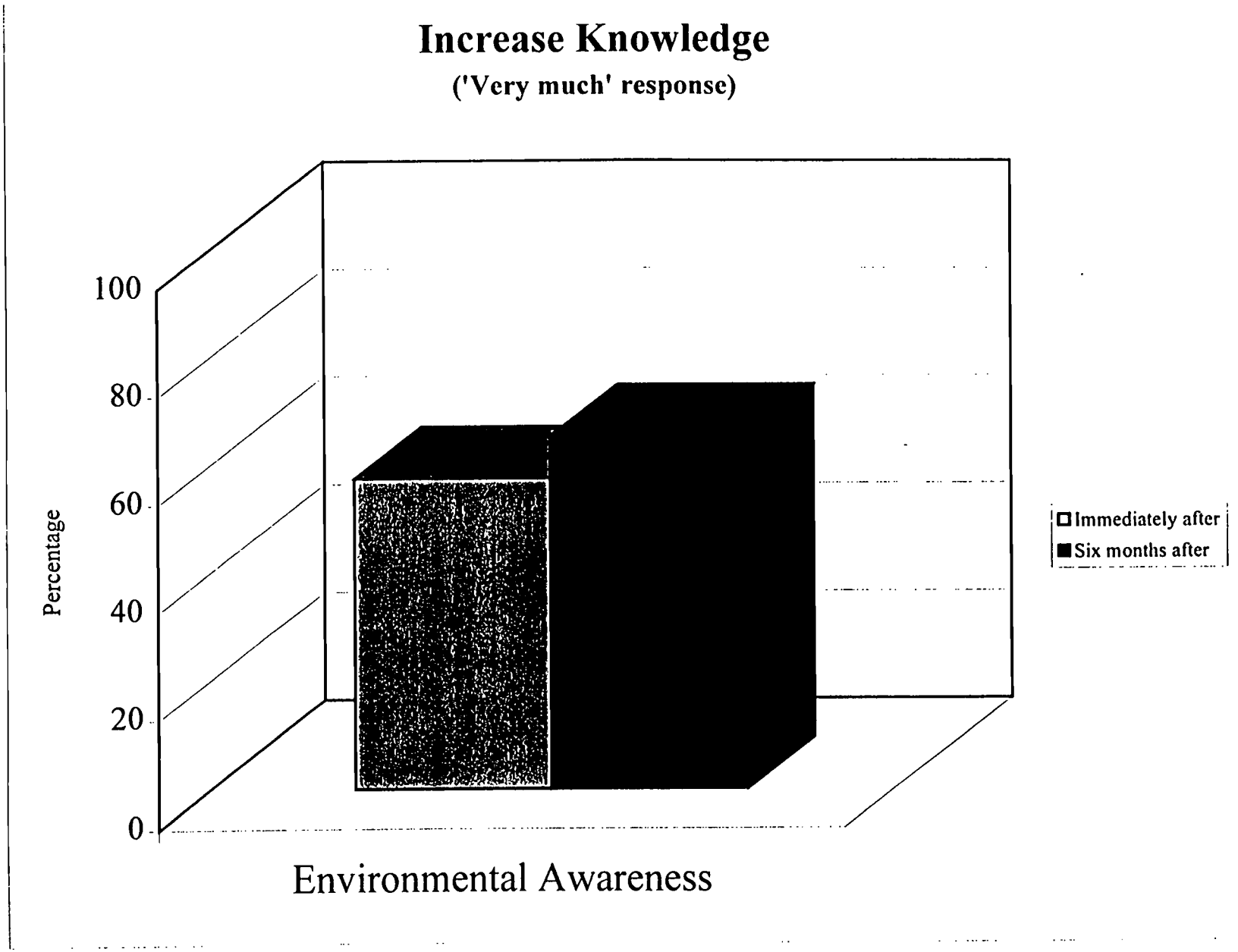
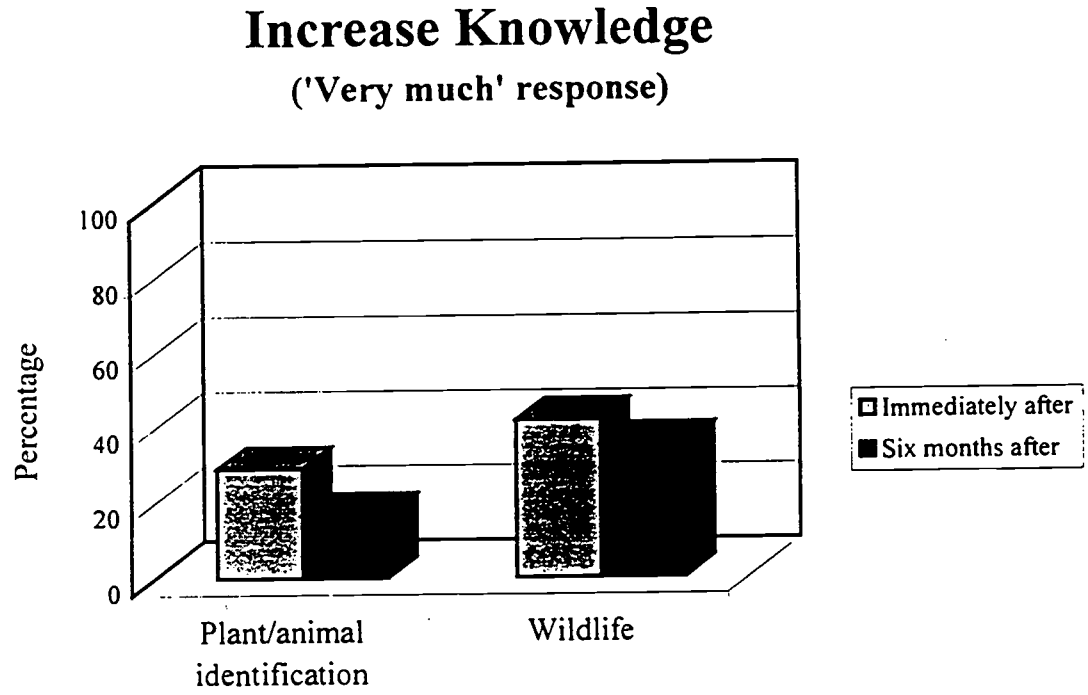

Increase Knowledge
('Very much' response)
100
80
60
40
20
0
Percentage
Immediately after
Six months after
Environmental Awareness

FIGURE 3-24


Increase Knowledge
('Very much' response)
Percentage
100
80
60
40
20
0
Plant/animal identification
Wildlife
Immediately after
Six months after

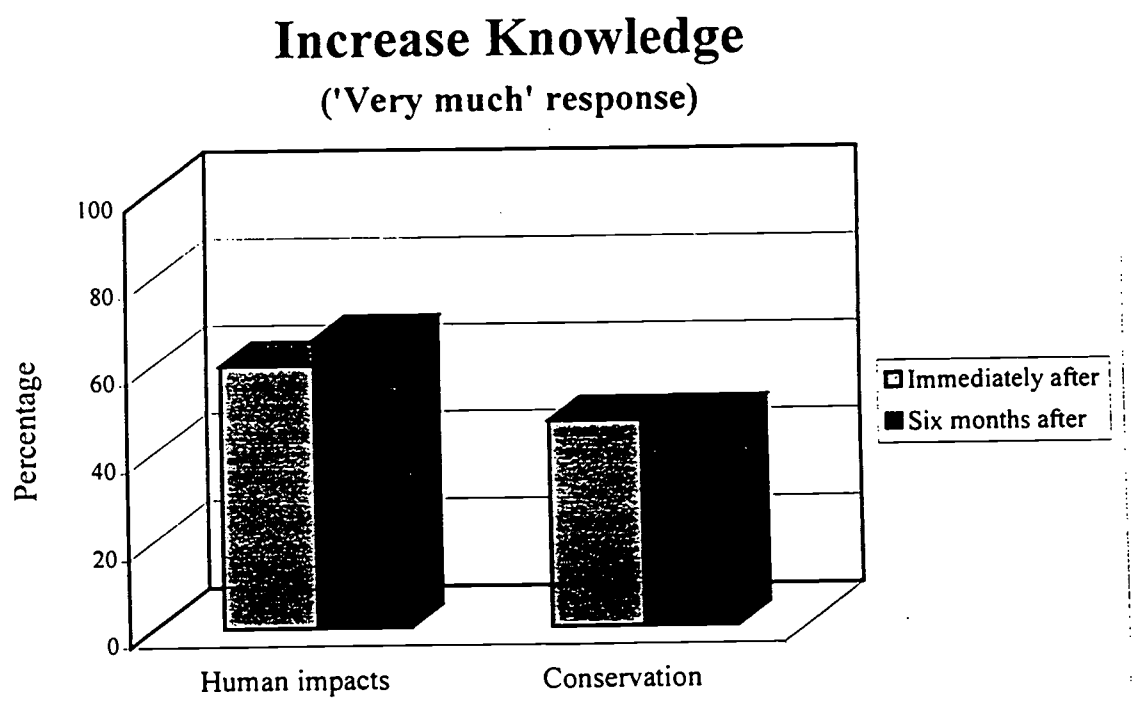

Increase Knowledge
('Very much' response)
Percentage
100
80
60
40
20
0
Human impacts
Conservation
Immediately after
Six months after

FIGURE 3-25

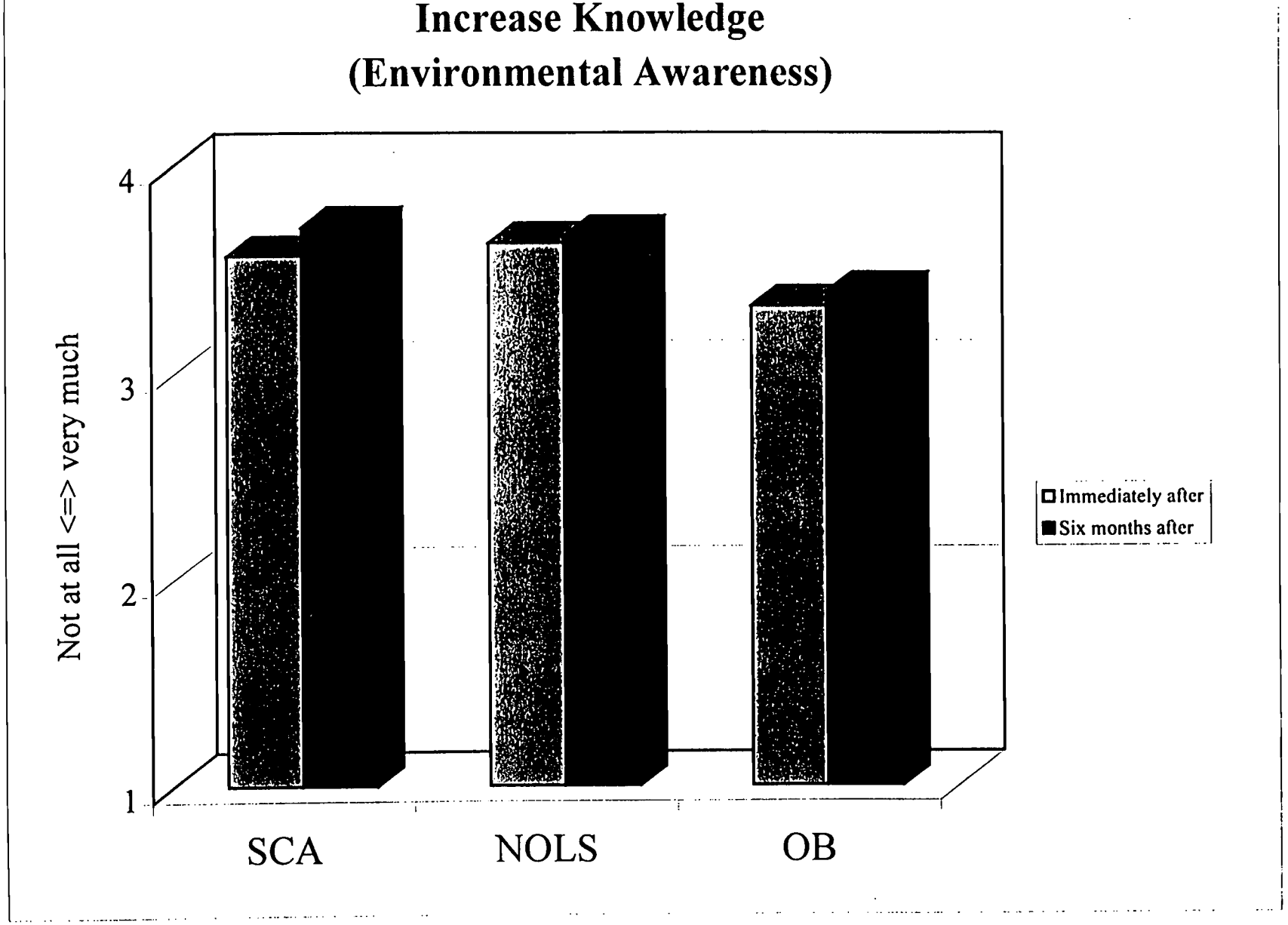
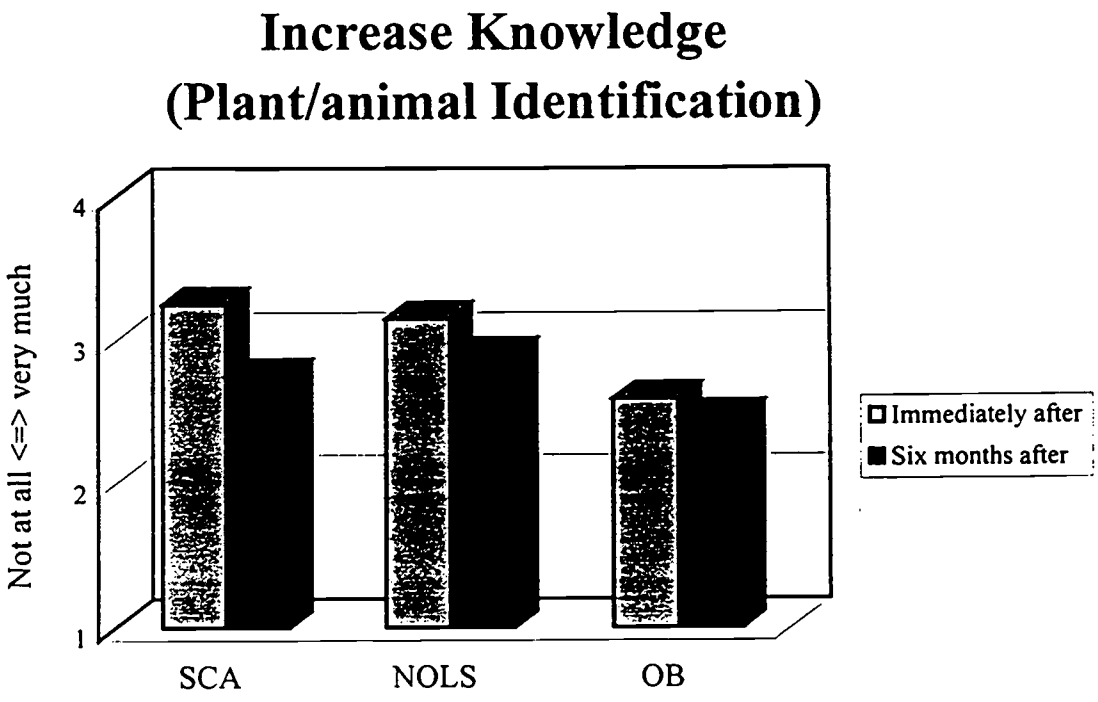

Increase Knowledge
(Environmental Awareness)
Not at all <=> very much
4
3
2
1
SCA
NOLS
OB
Immediately after
Six months after

FIGURE 3-26


Increase Knowledge
(Plant/animal Identification)
Not at all <=> very much
4
3
2
1
SCA
NOLS
OB
Immediately after
Six months after

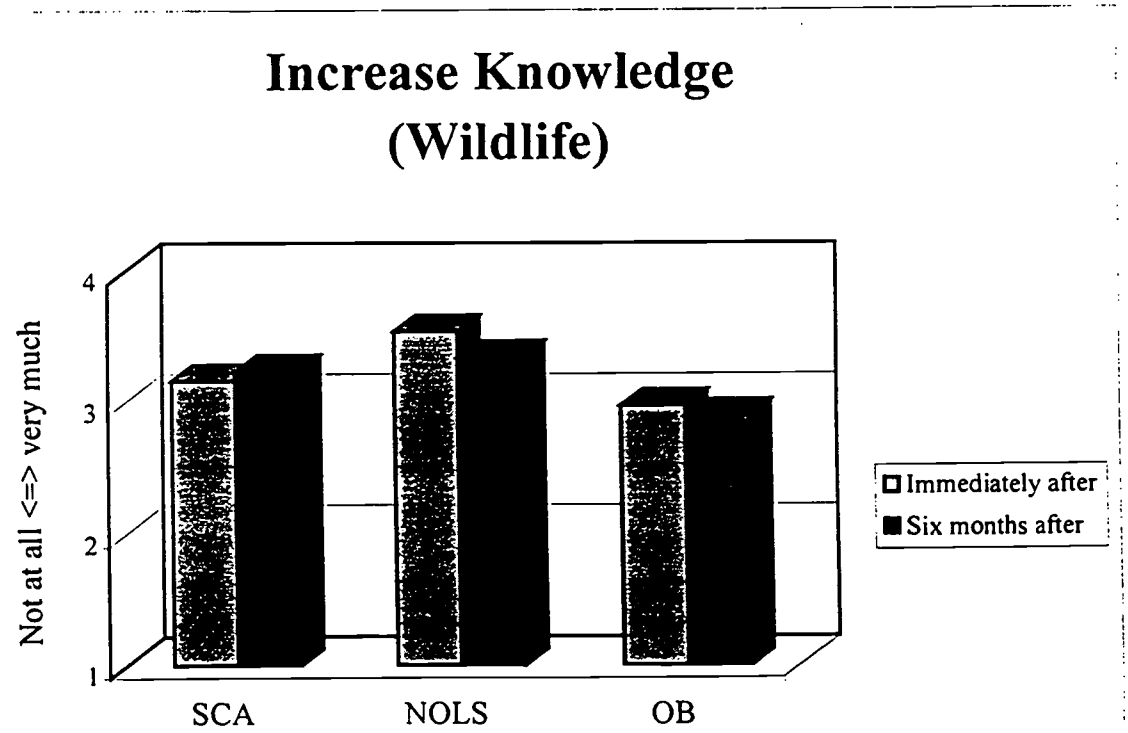
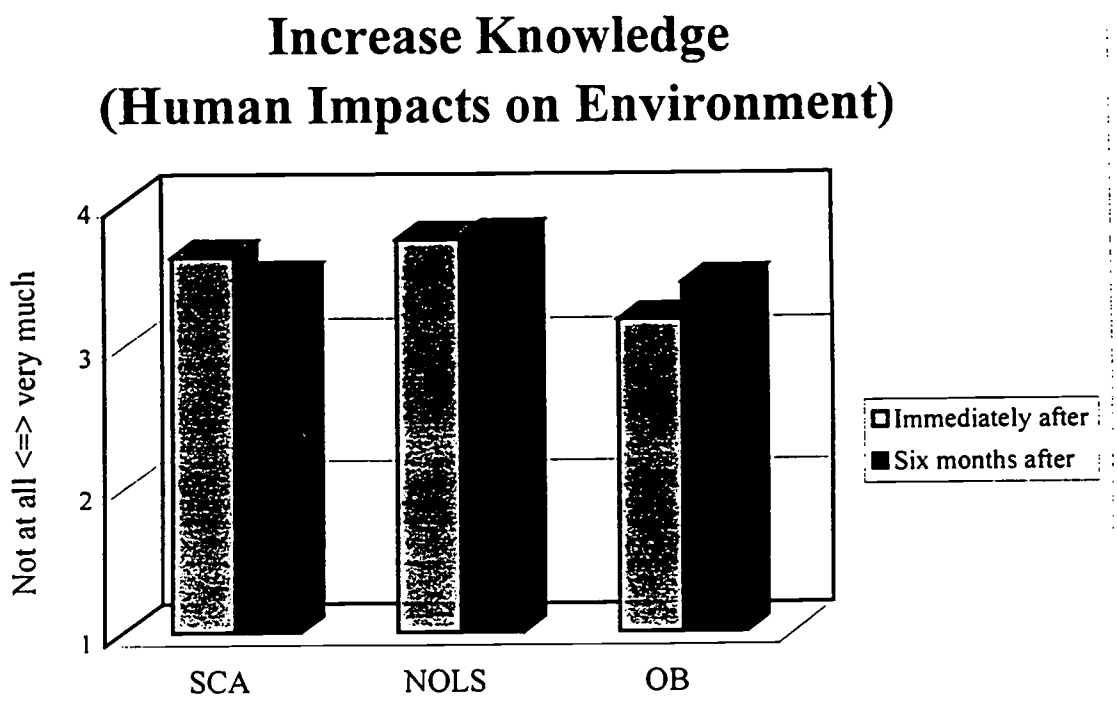

Increase Knowledge
(Wildlife)
Not at all <=> very much
4
3
2
1
SCA
NOLS
OB
Immediately after
Six months after

FIGURE 3-27


Increase Knowledge
(Human Impacts on Environment)
Not at all <=> very much
4
3
2
1
SCA
NOLS
OB
Immediately after
Six months after

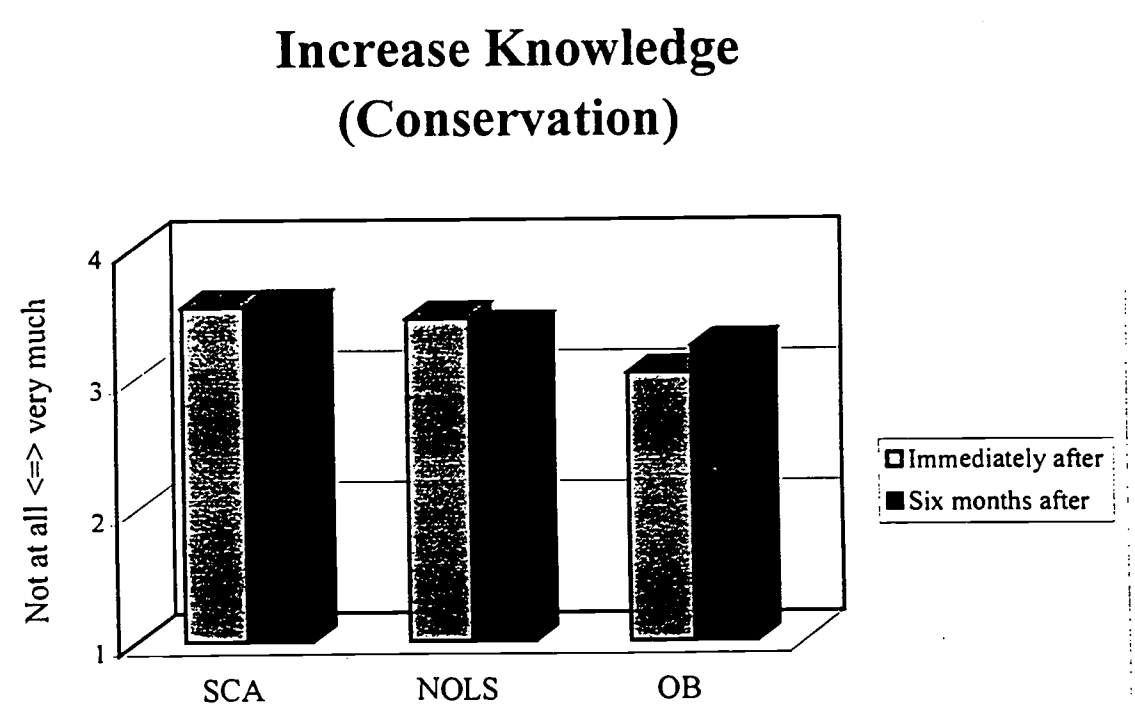

Increase Knowledge
(Conservation)
Not at all <=> very much
4
3
2
1
SCA
NOLS
OB
Immediately after
Six months after

FIGURE 3-28

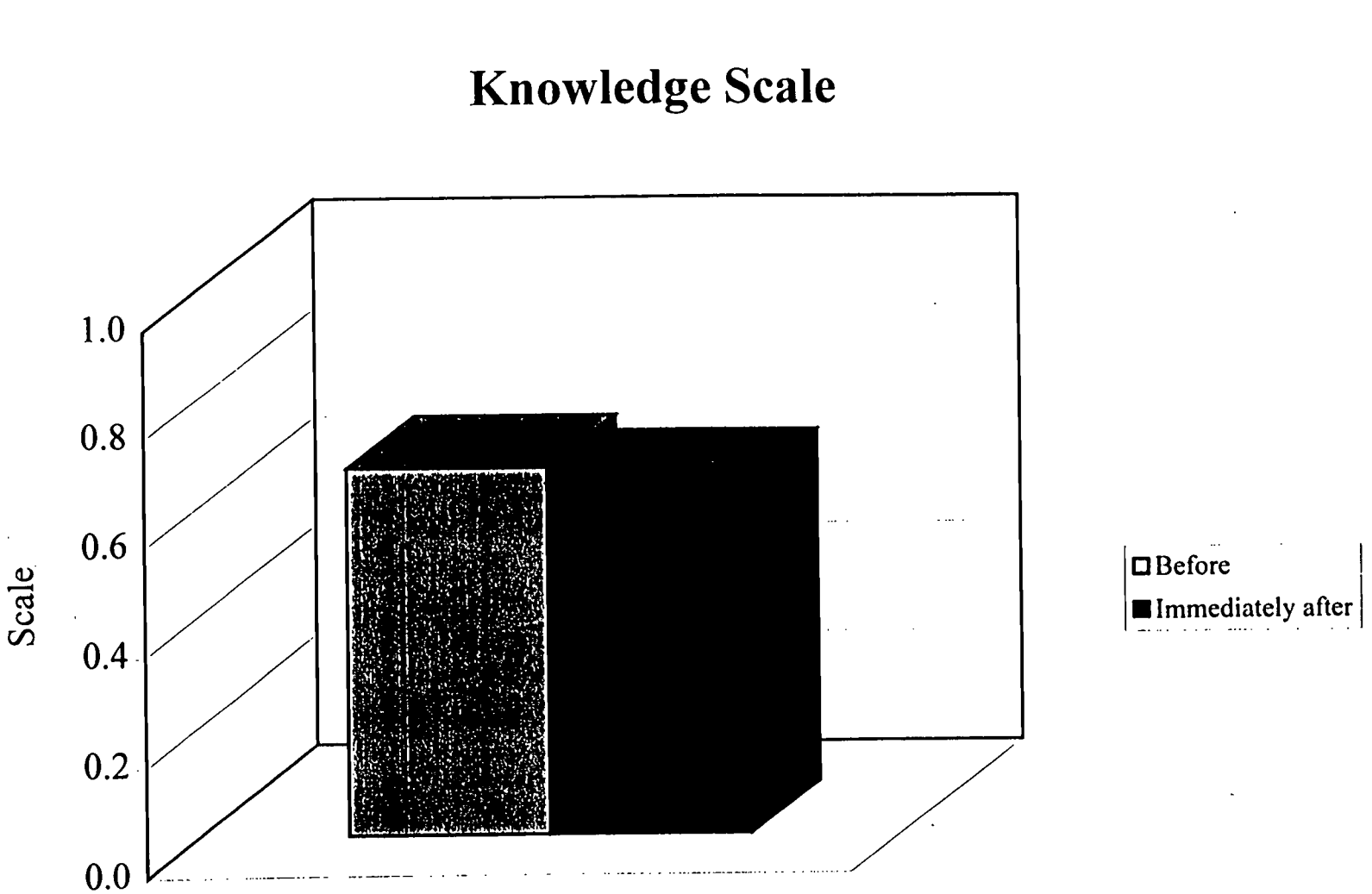

Knowledge Scale
Scale
1.0
0.8
0.6
0.4
0.2
0.0
Before
Immediately after

FIGURE 3-29

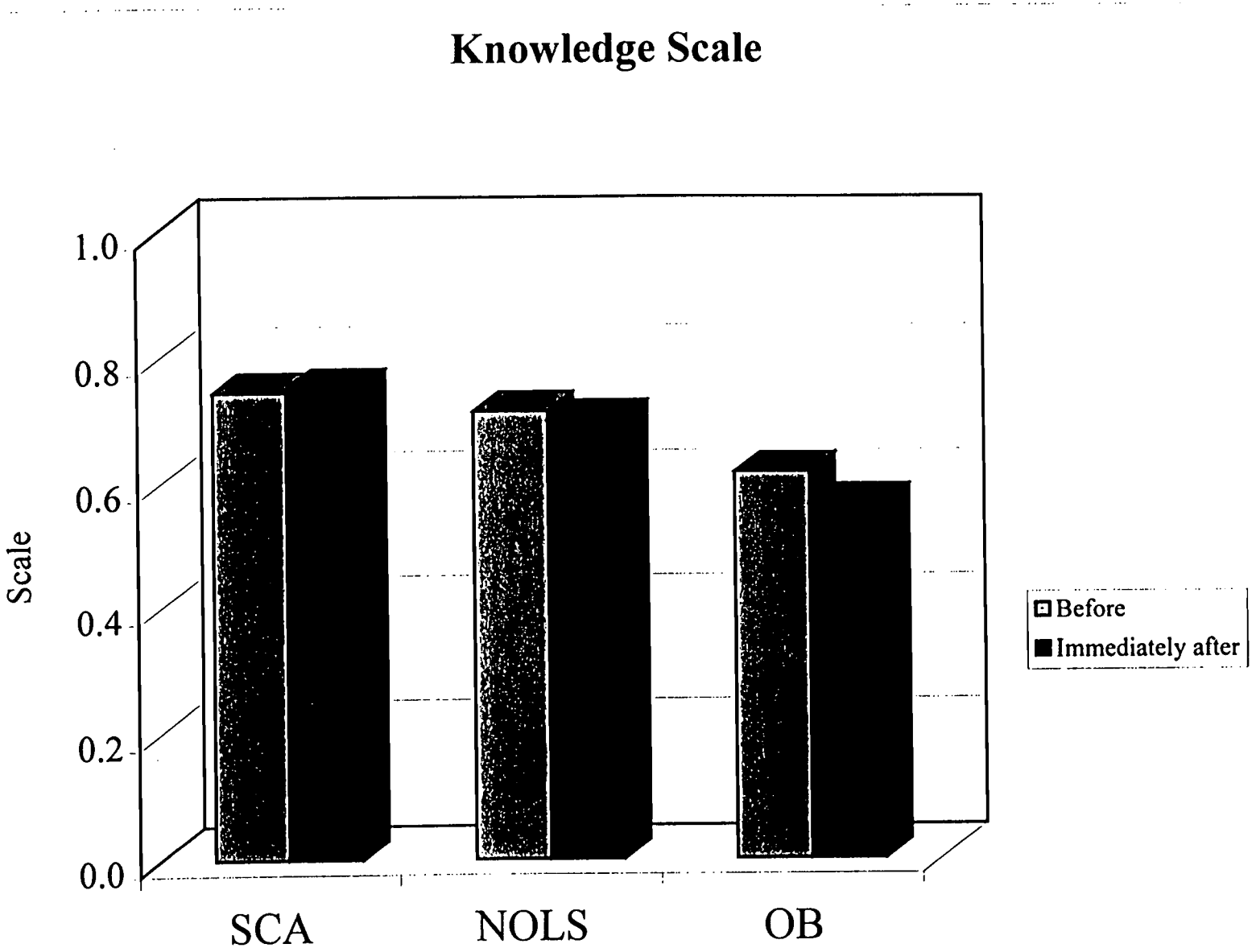
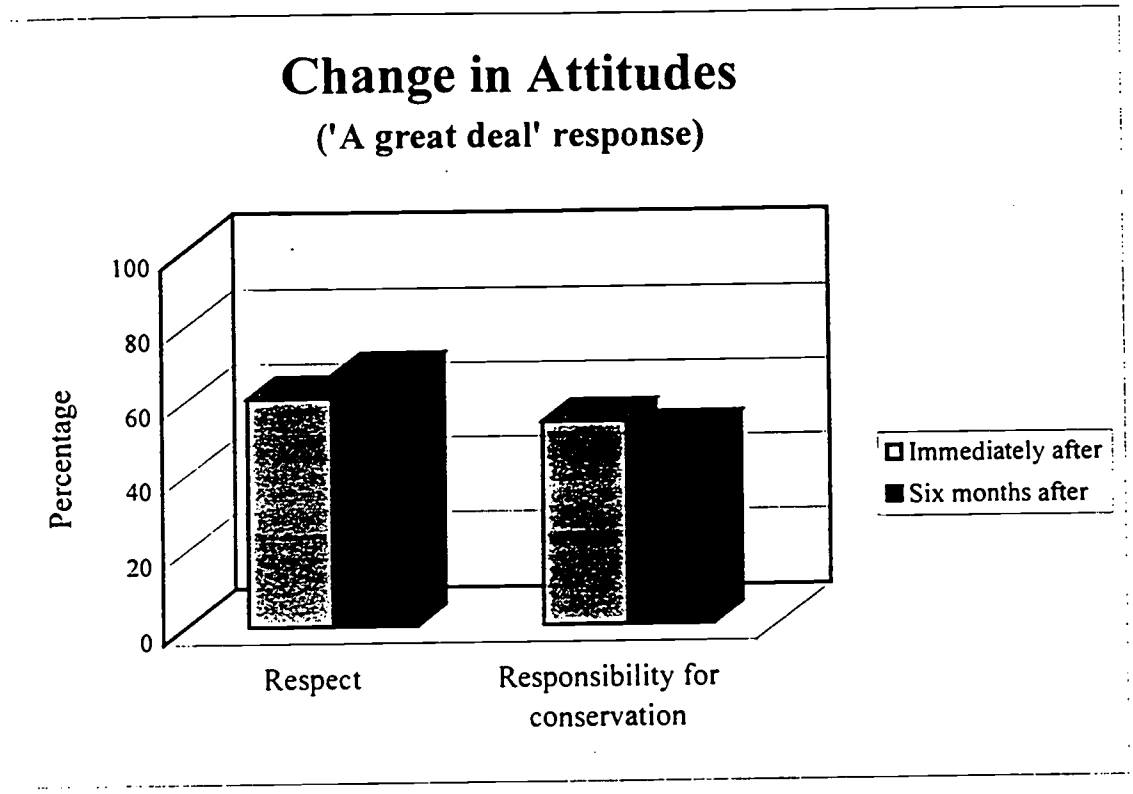

Knowledge Scale
Scale
1.0
0.8
0.6
0.4
0.2
0.0
SCA
NOLS
OB
Before
Immediately after

FIGURE 3-30


Change in Attitudes
('A great deal' response)
Percentage
100
80
60
40
20
0
Respect
Responsibility for conservation
Immediately after
Six months after

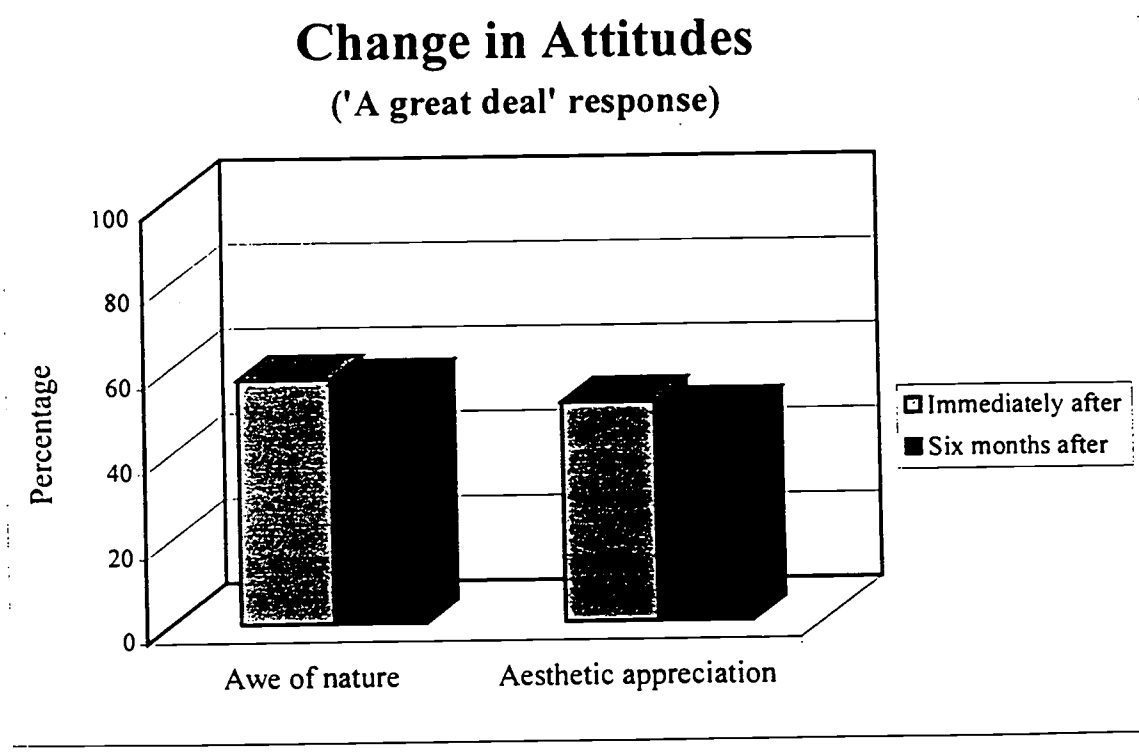
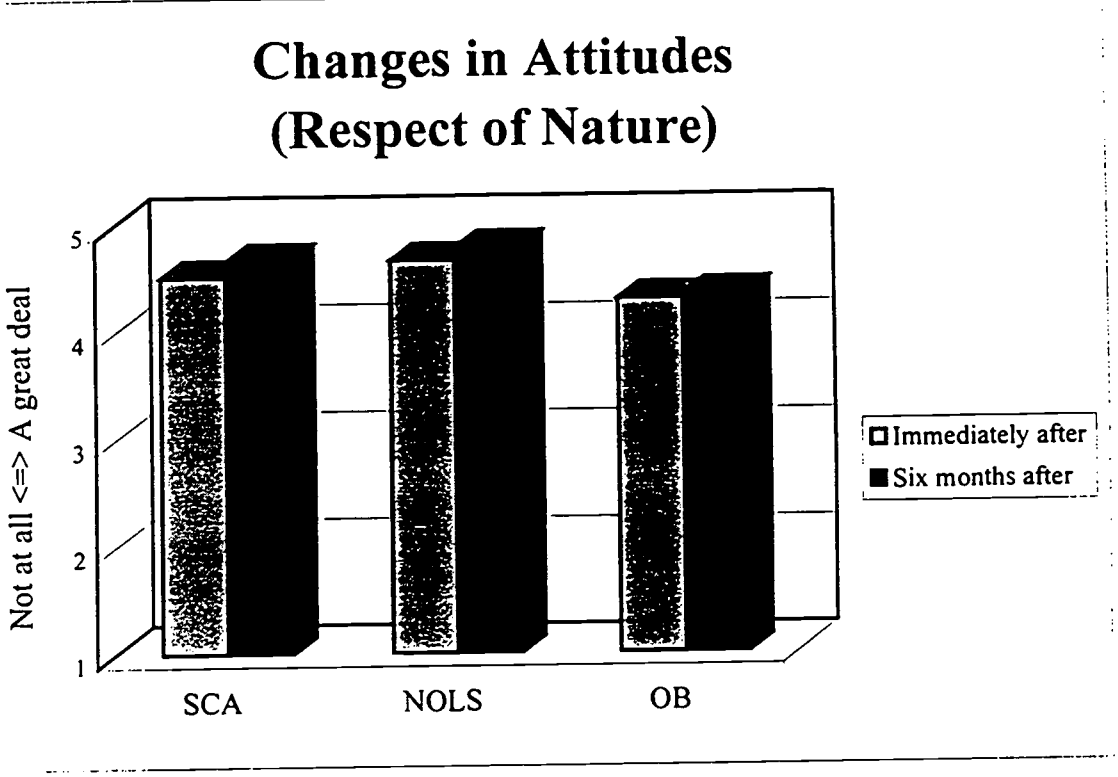

Change in Attitudes
('A great deal' response)
Percentage
100
80
60
40
20
0
Awe of nature
Aesthetic appreciation
Immediately after
Six months after

FIGURE 3-31


Changes in Attitudes
(Respect of Nature)
Not at all <=> A great deal
5
4
3
2
1
SCA
NOLS
OB
Immediately after
Six months after

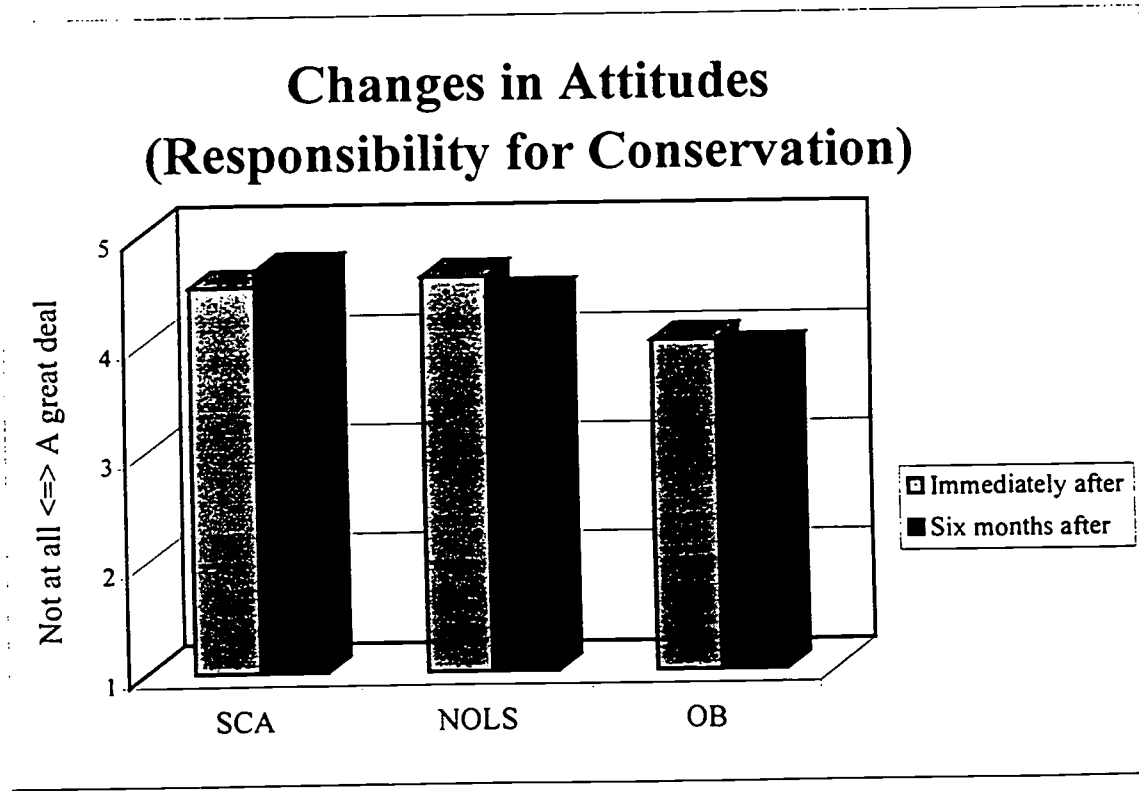
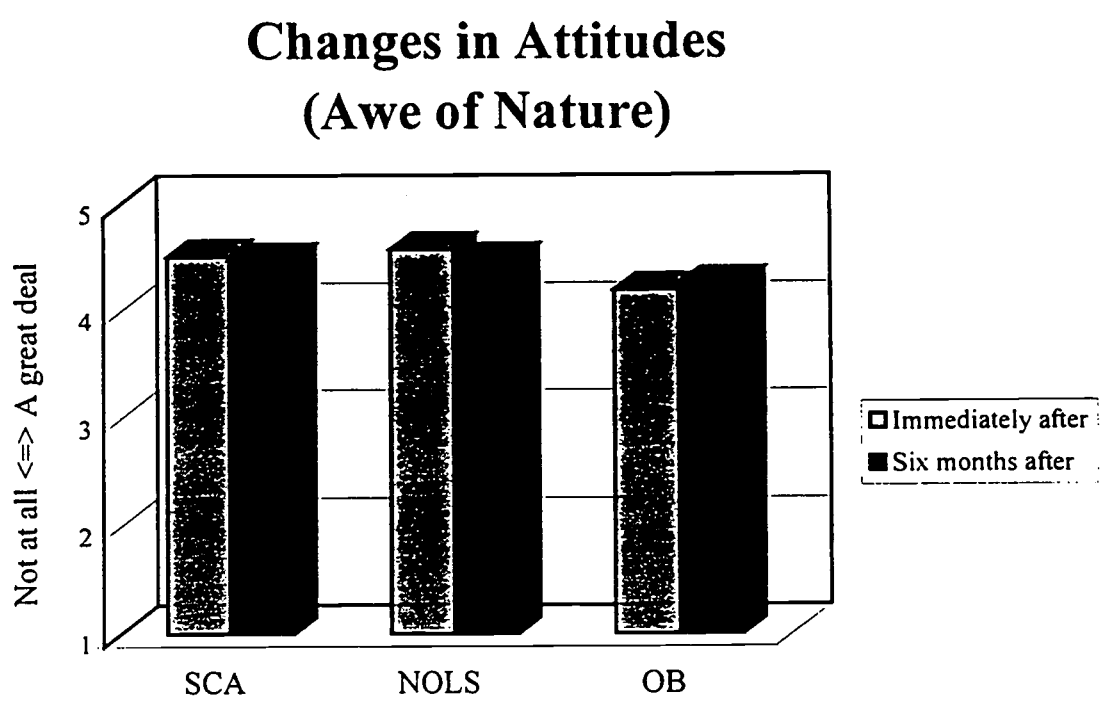
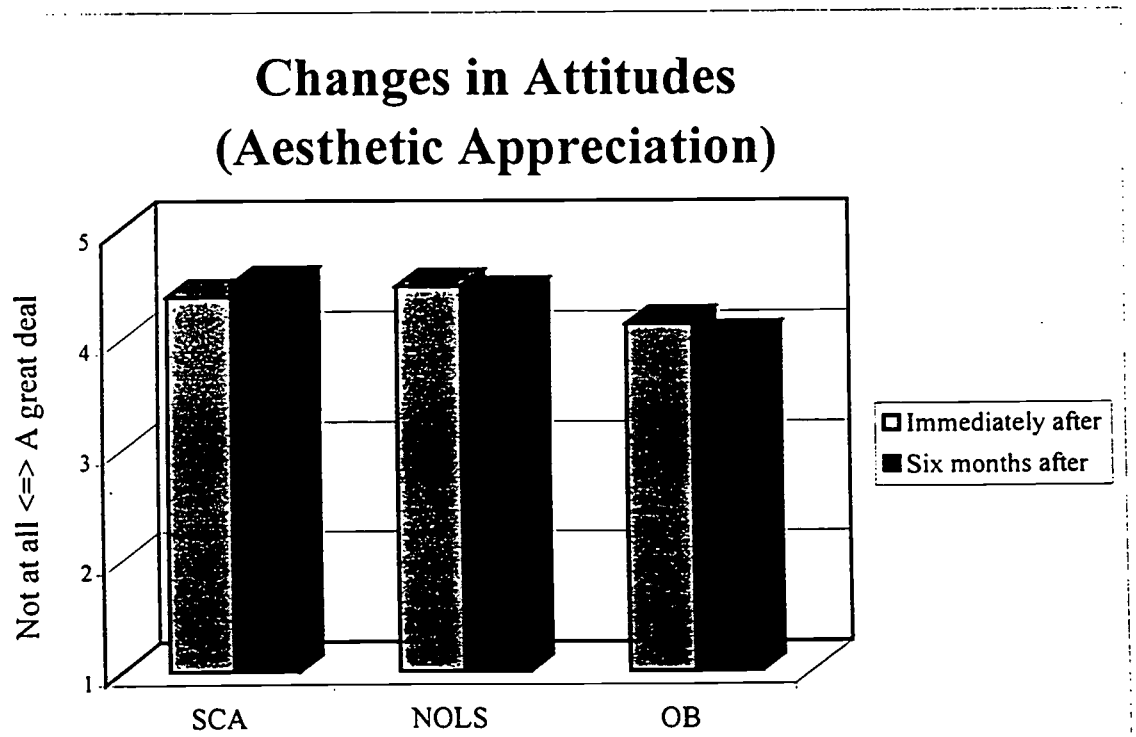

Changes in Attitudes
(Responsibility for Conservation)
Not at all <=> A great deal
5
4
3
2
1
SCA
NOLS
OB
Immediately after
Six months after

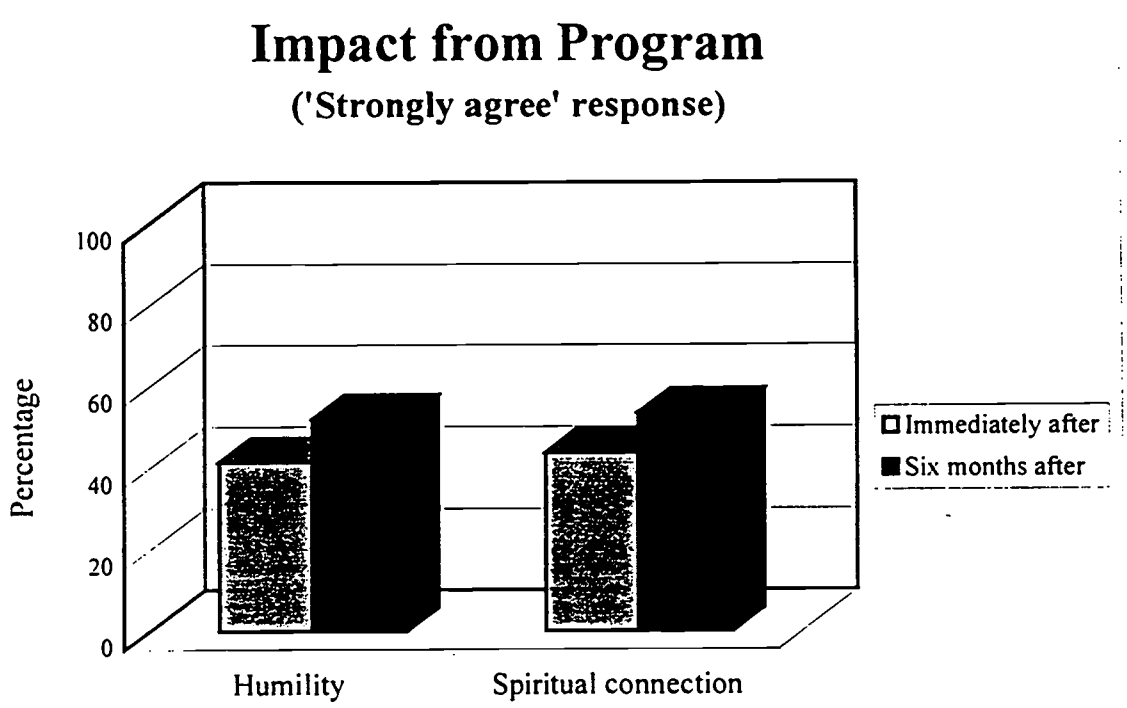
FIGURE 3-32


Changes in Attitudes
(Awe of Nature)
Not at all <=> A great deal
5
4
3
2
1
SCA
NOLS
OB
Immediately after
Six months after


Changes in Attitudes
(Aesthetic Appreciation)
Not at all <=> A great deal
5
4
3
2
1
SCA
NOLS
OB
Immediately after
Six months after

x

FIGURE 3-33


Impact from Program
('Strongly agree' response)
Percentage
100
80
60
40
20
0
Humility
Spiritual connection
Immediately after
Six months after

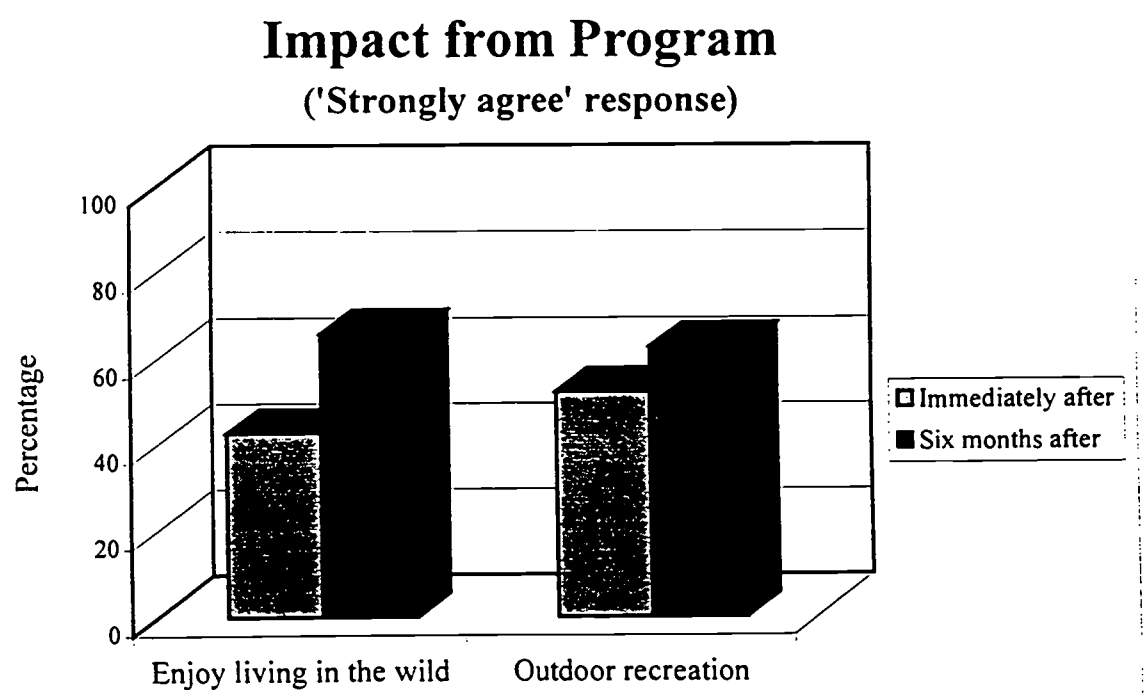
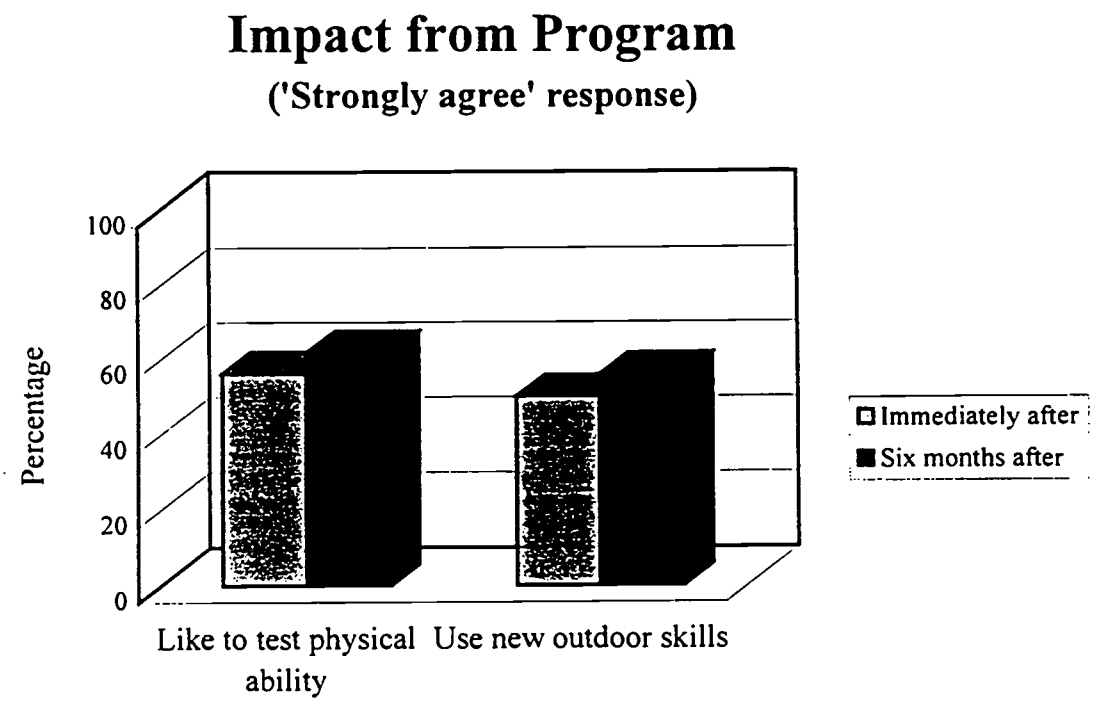

Impact from Program
('Strongly agree' response)
Percentage
100
80
60
40
20
0
Enjoy living in the wild
Outdoor recreation
Immediately after
Six months after

FIGURE 3-34


Impact from Program
('Strongly agree' response)
Percentage
100
80
60
40
20
0
Like to test physical ability
Use new outdoor skills
Immediately after
Six months after

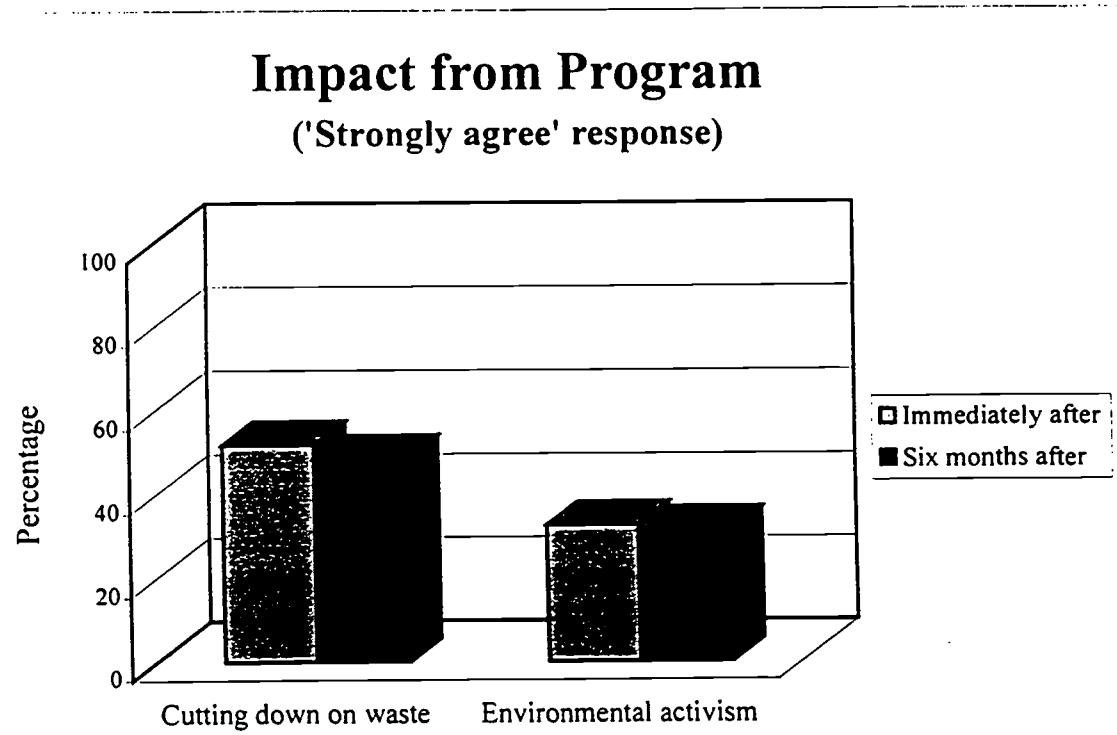
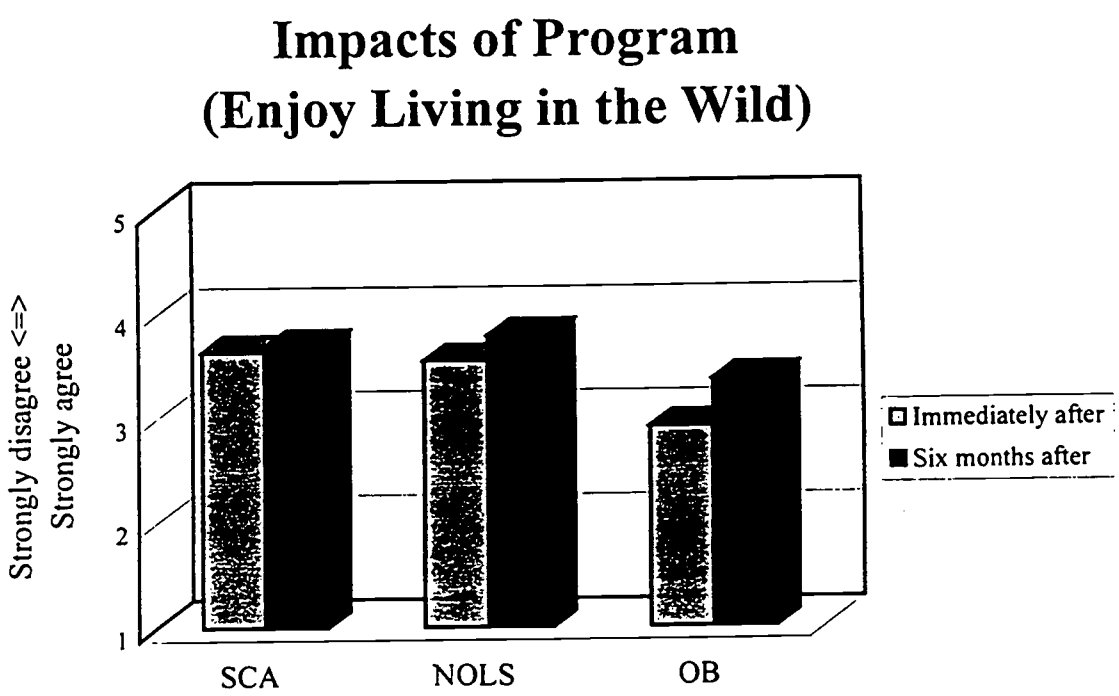

Impact from Program
('Strongly agree' response)
Percentage
100
80
60
40
20
0
Cutting down on waste
Environmental activism
Immediately after
Six months after

FIGURE 3-35


Impacts of Program
(Enjoy Living in the Wild)
Strongly disagree <=>
Strongly agree
5
4
3
2
1
SCA
NOLS
OB
Immediately after
Six months after

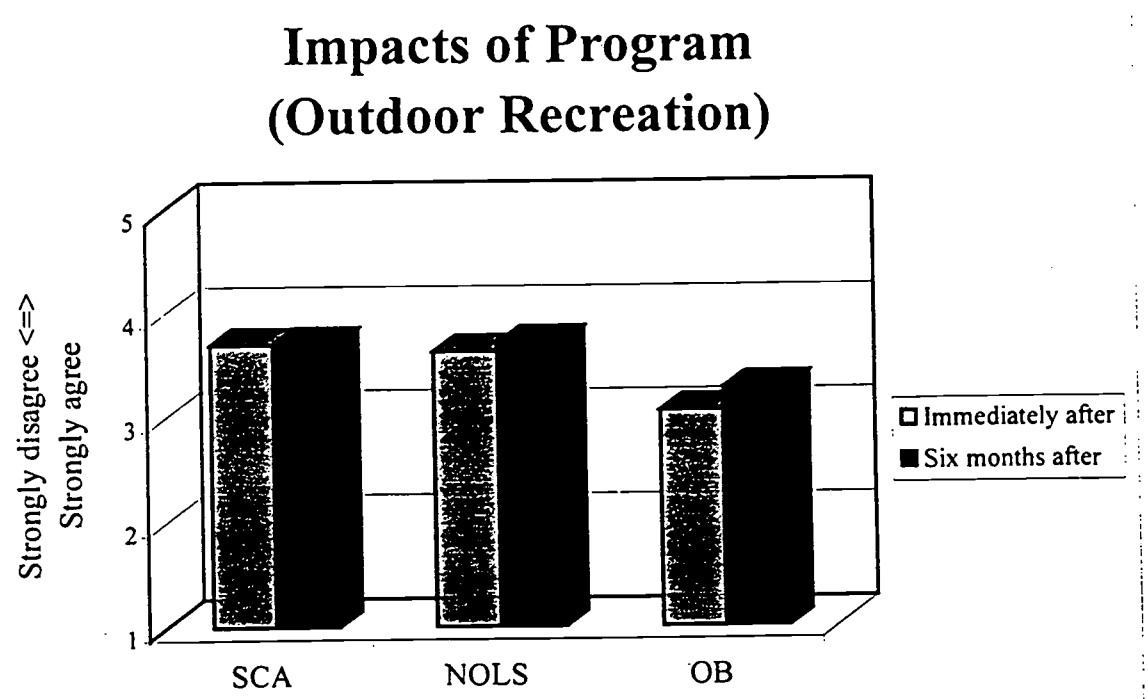
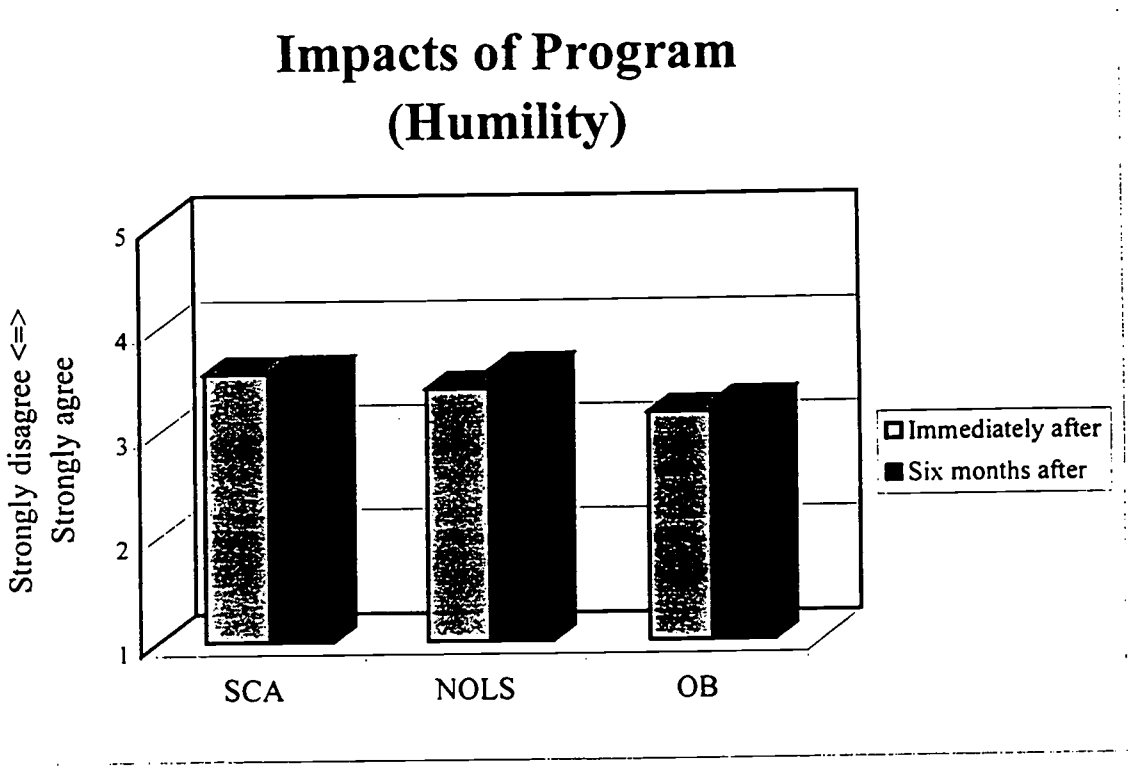

Impacts of Program
(Outdoor Recreation)
Strongly disagree <=>
Strongly agree
5
4
3
2
1
SCA
NOLS
OB
Immediately after
Six months after

FIGURE 3-36


Impacts of Program
(Humility)
Strongly disagree <=>
Strongly agree
5
4
3
2
1
SCA
NOLS
OB
Immediately after
Six months after

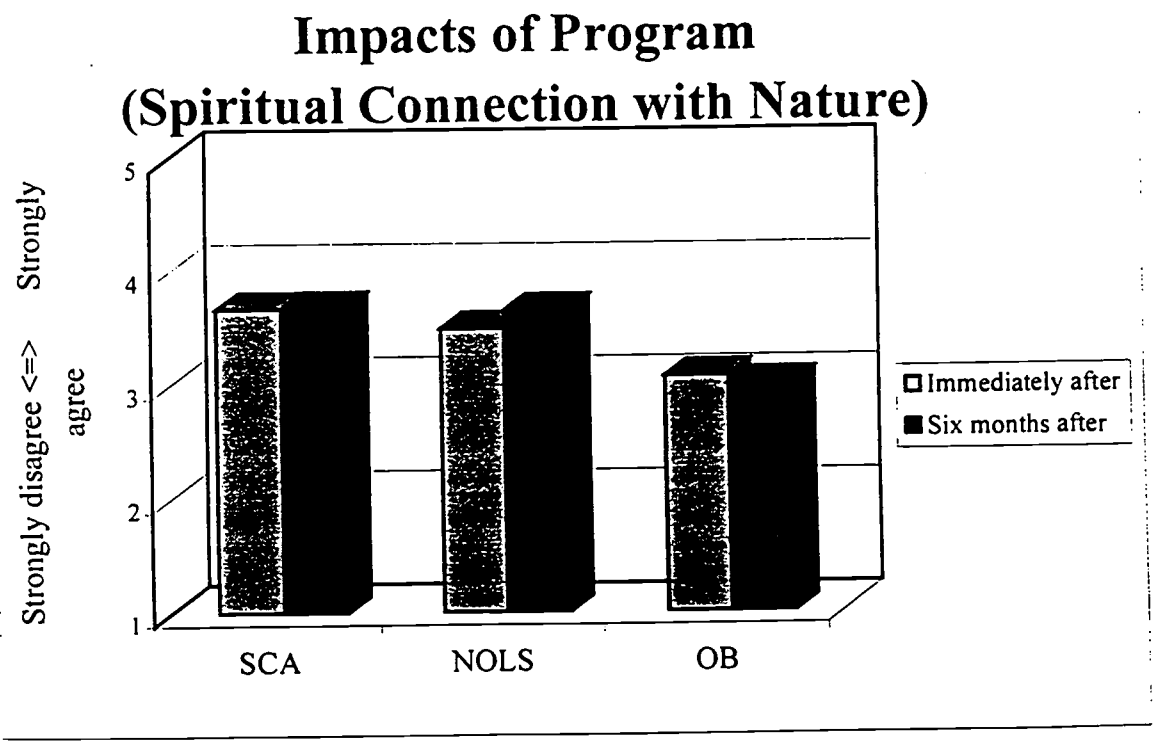
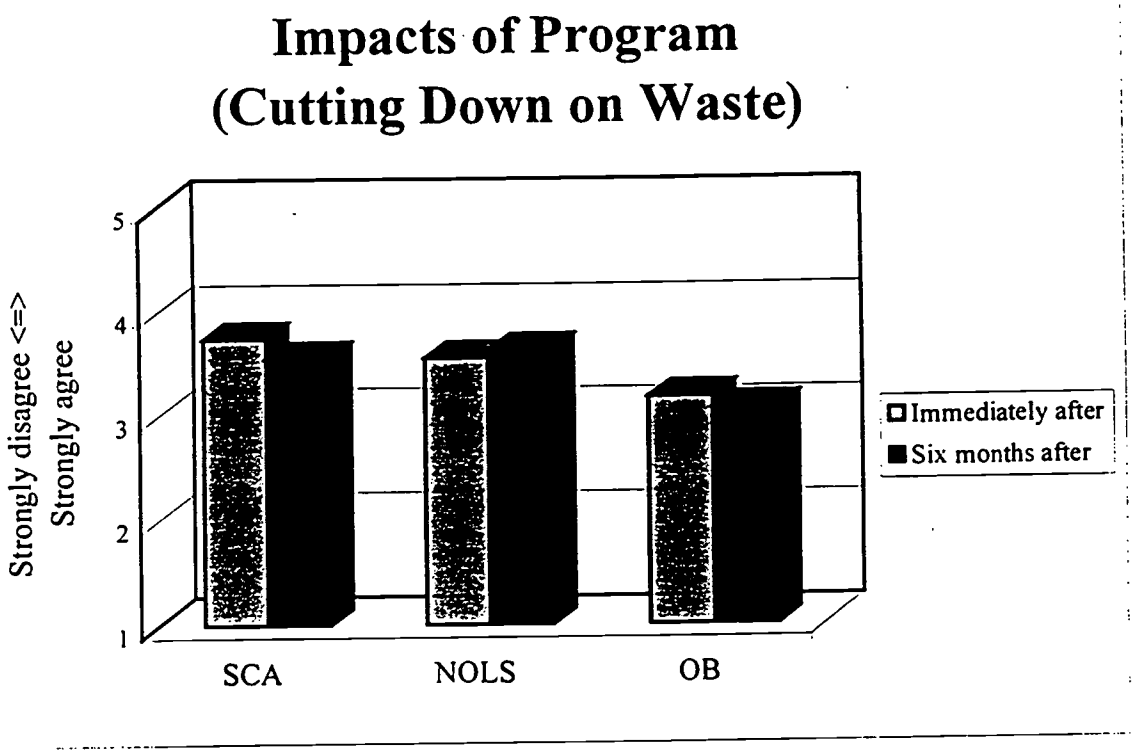

Impacts of Program
(Spiritual Connection with Nature)
Strongly disagree <=>
Strongly agree
5
4
3
2
1
SCA
NOLS
OB
Immediately after
Six months after

FIGURE 3-37


Impacts of Program
(Cutting Down on Waste)
Strongly disagree <=>
Strongly agree
5
4
3
2
1
SCA
NOLS
OB
Immediately after
Six months after

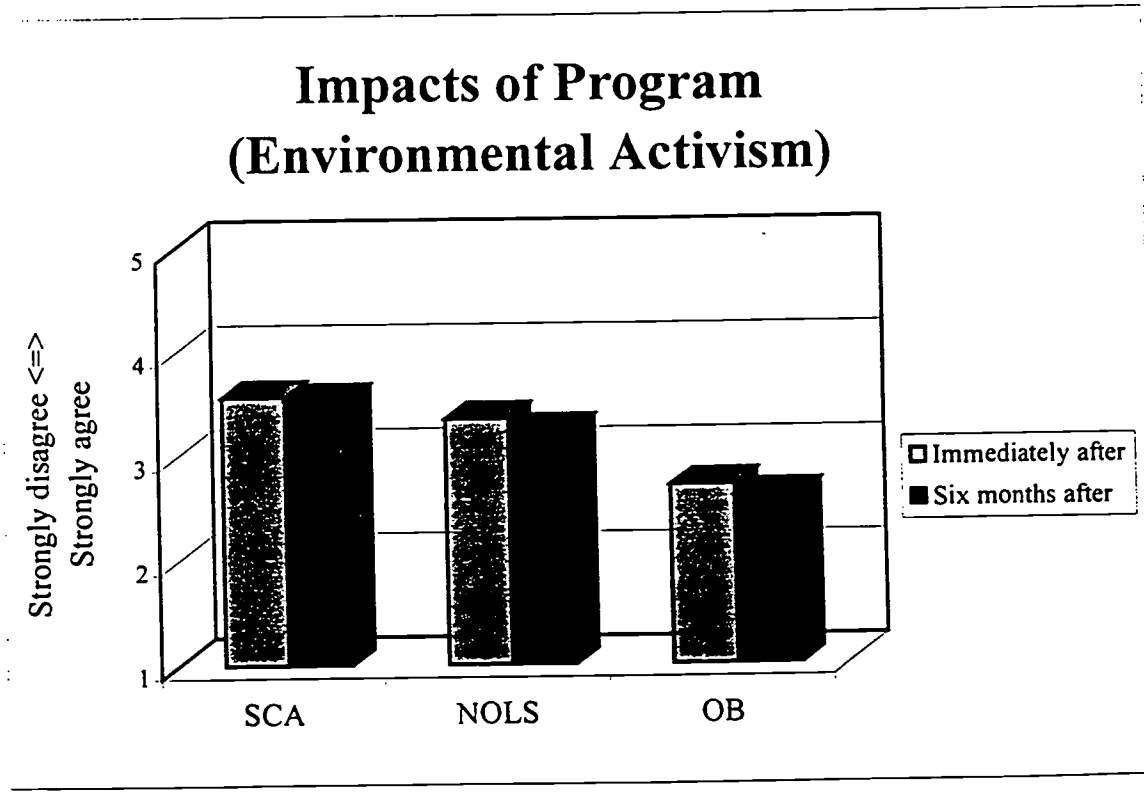
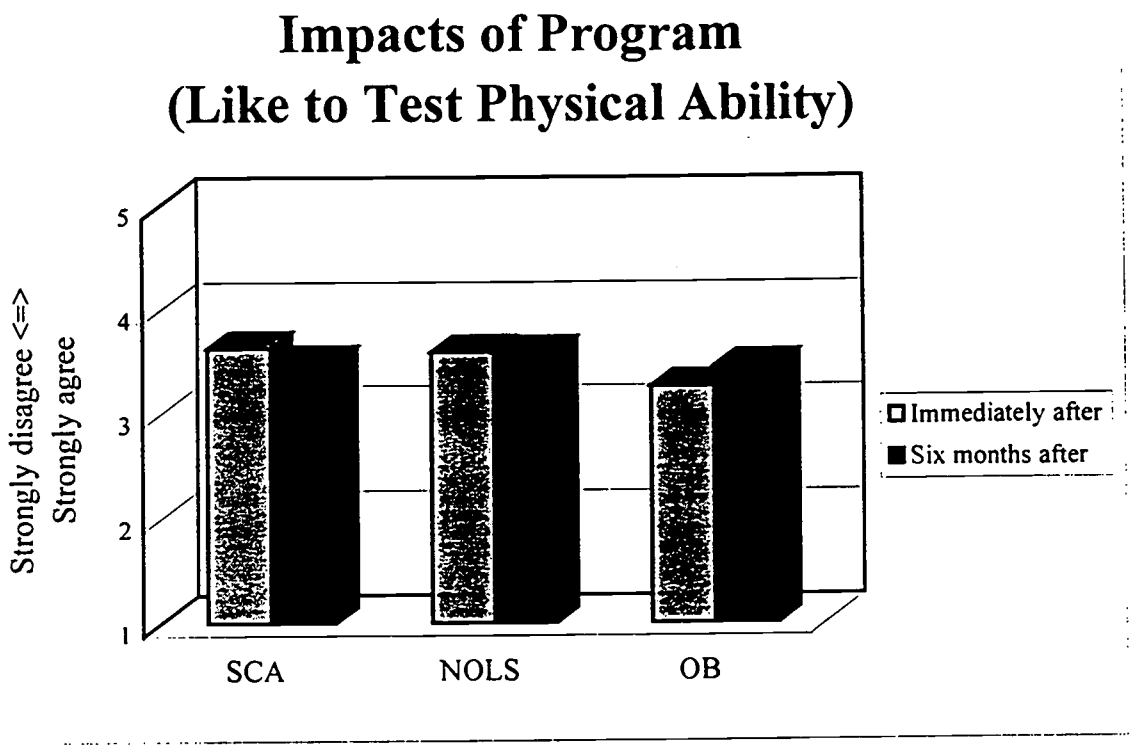

Impacts of Program
(Environmental Activism)
Strongly disagree <=>
Strongly agree
5
4
3
2
1
SCA
NOLS
OB
Immediately after
Six months after

FIGURE 3-38



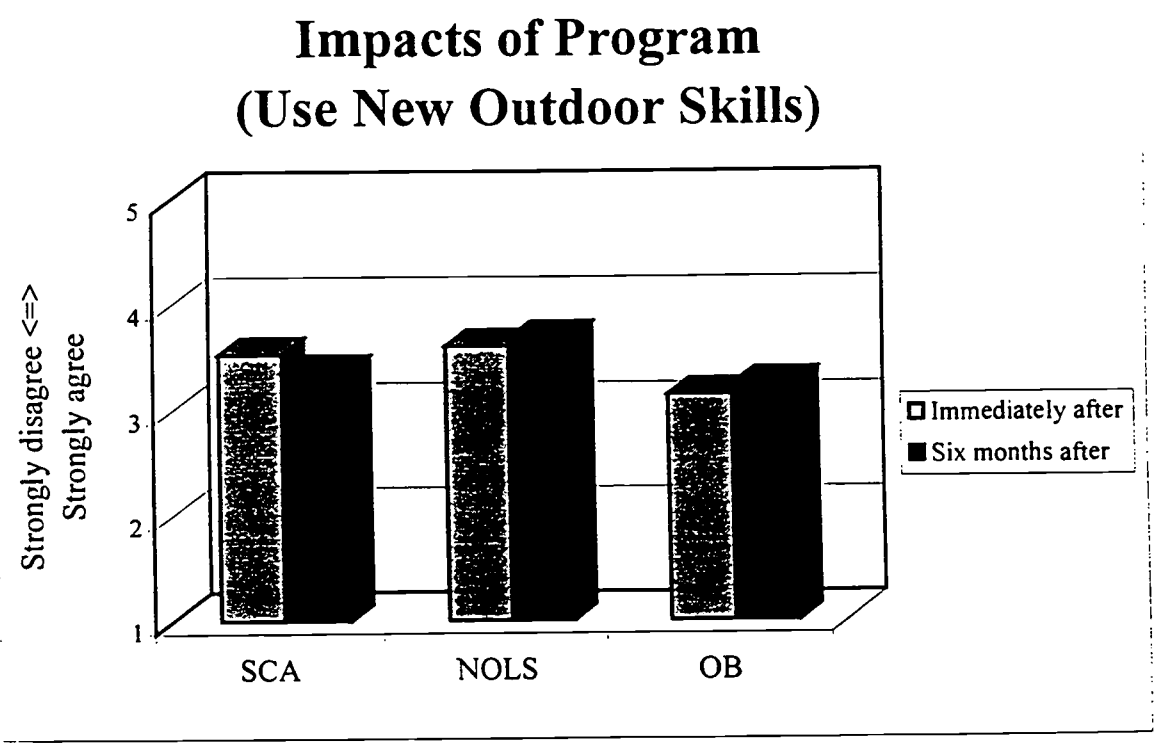
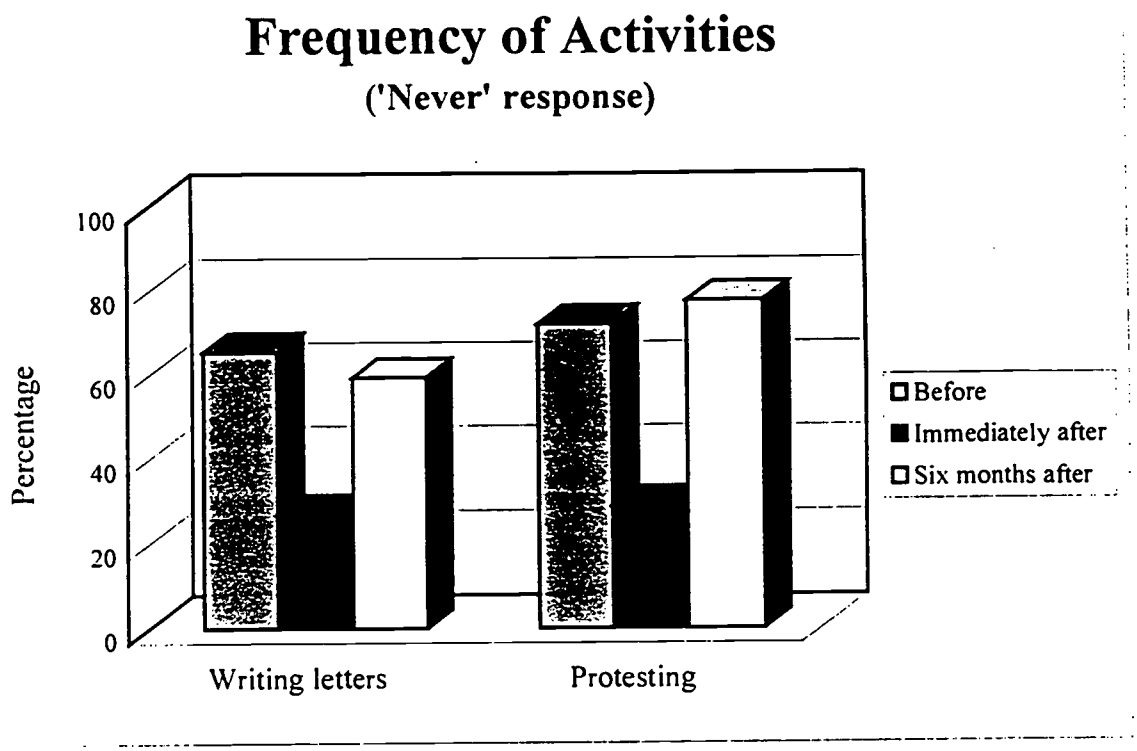


FIGURE 3-39


Frequency of Activities
('Never' response)
Percentage
100
80
60
40
20
0
Writing letters
Protesting
Before
Immediately after
Six months after

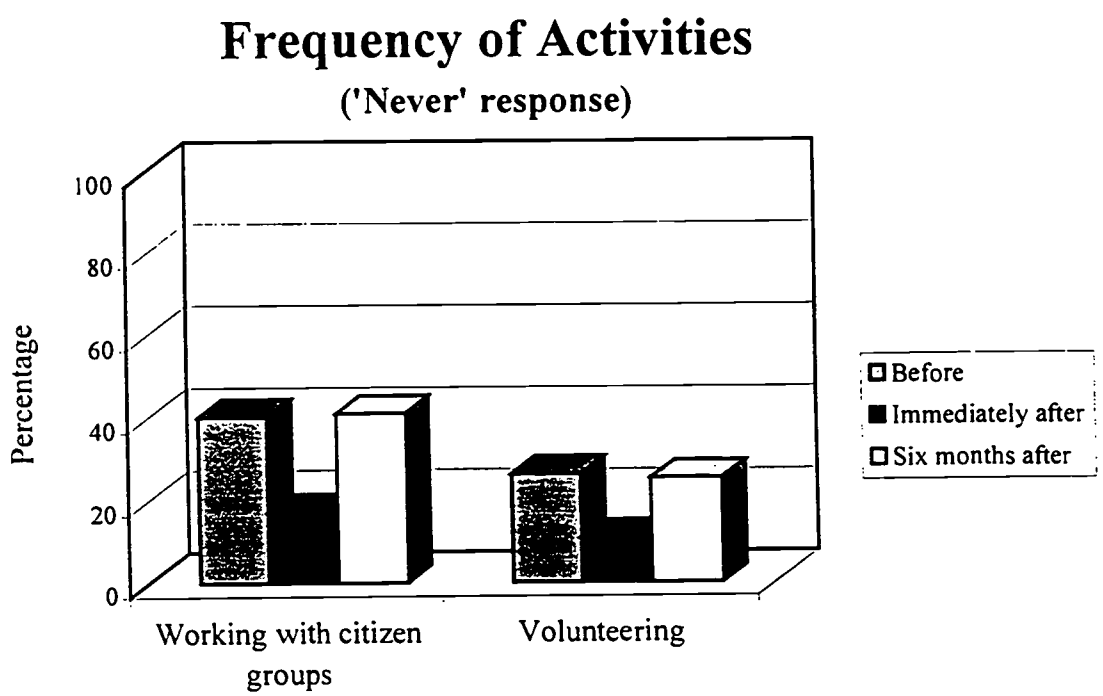
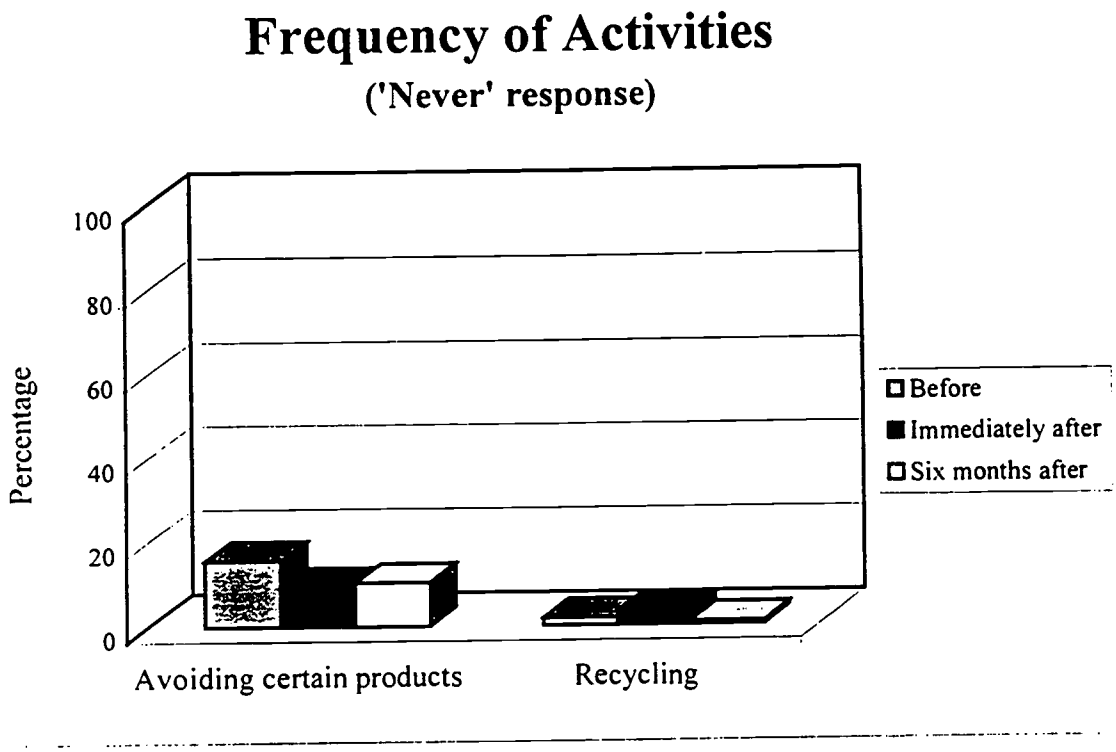

Frequency of Activities
('Never' response)
Percentage
100
80
60
40
20
0
Working with citizen groups
Volunteering
Before
Immediately after
Six months after

FIGURE 3-40


Frequency of Activities
('Never' response)
Percentage
100
80
60
40
20
0
Avoiding certain products
Recycling
Before
Immediately after
Six months after

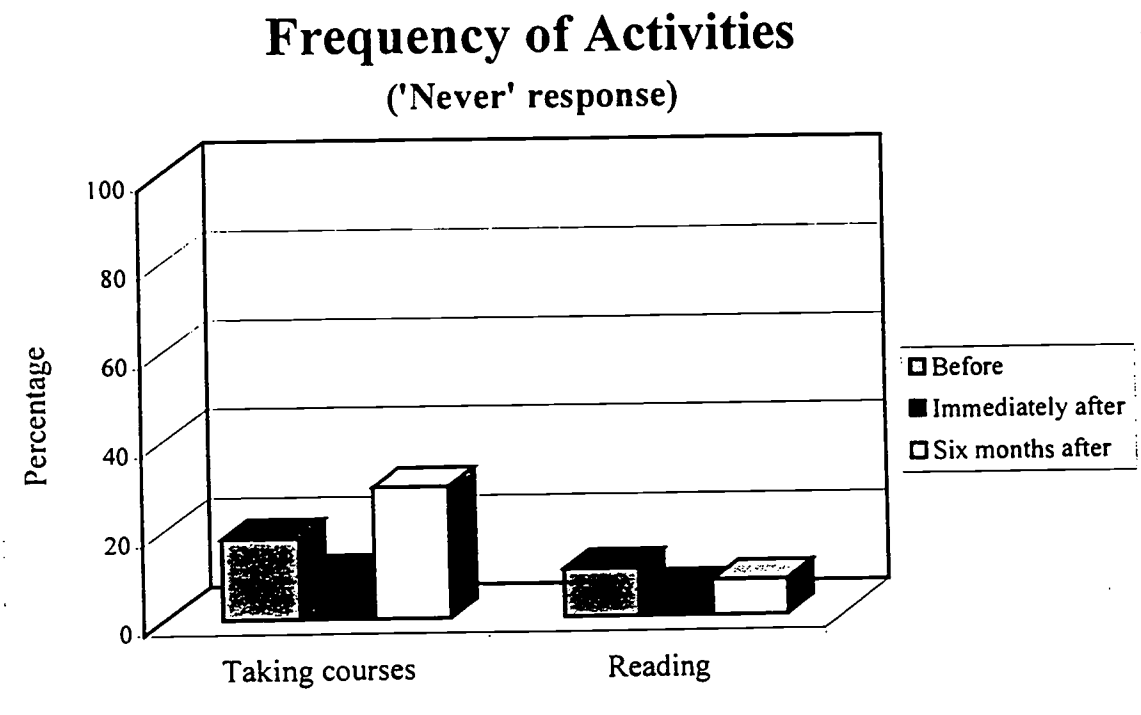

Frequency of Activities
('Never' response)
Percentage
100
80
60
40
20
0
Taking courses
Reading
Before
Immediately after
Six months after

FIGURE 3-41

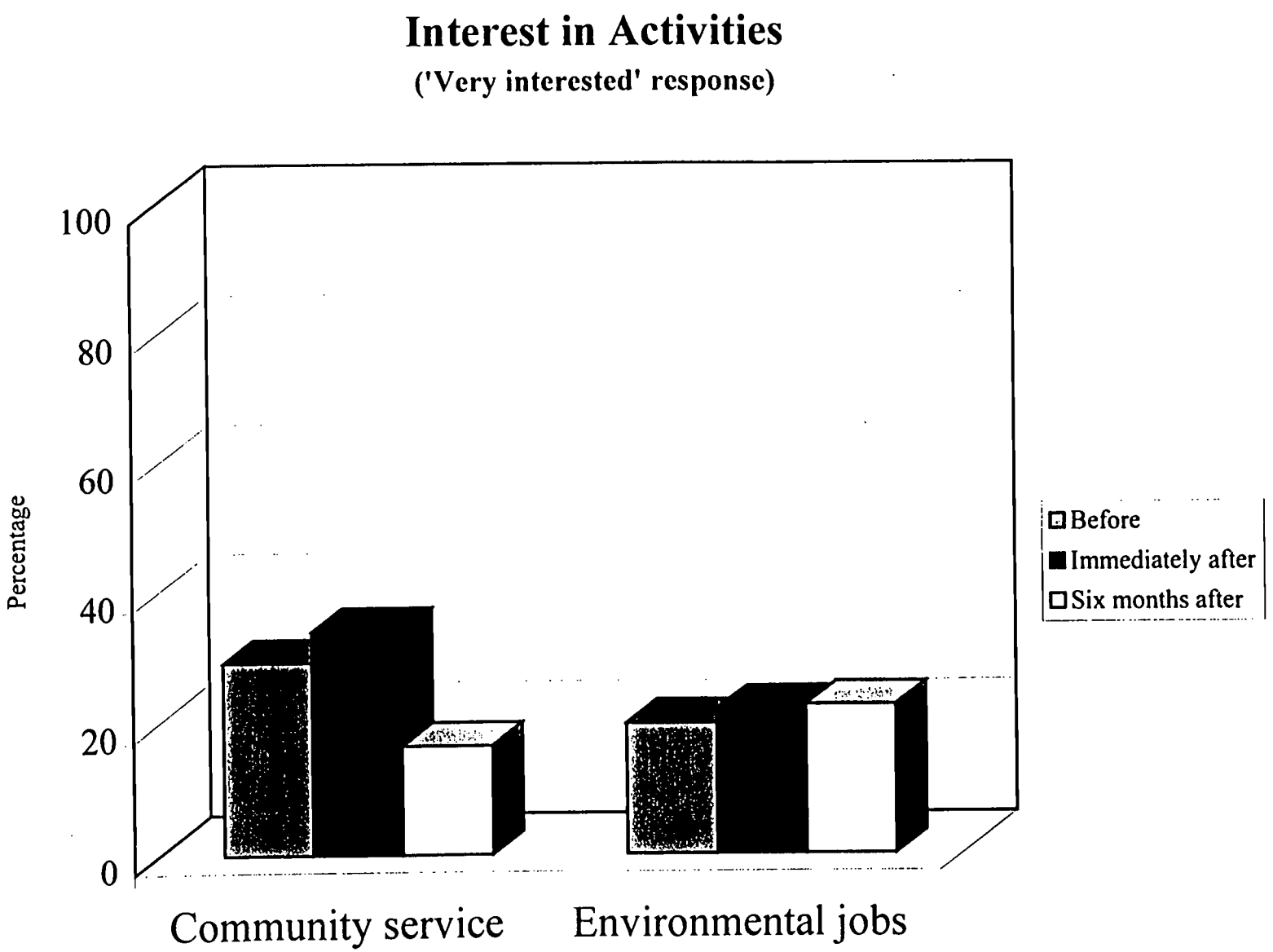

Interest in Activities
('Very interested' response)
Percentage
100
80
60
40
20
0
Community service
Environmental jobs
Before
Immediately after
Six months after

FIGURE 3-42

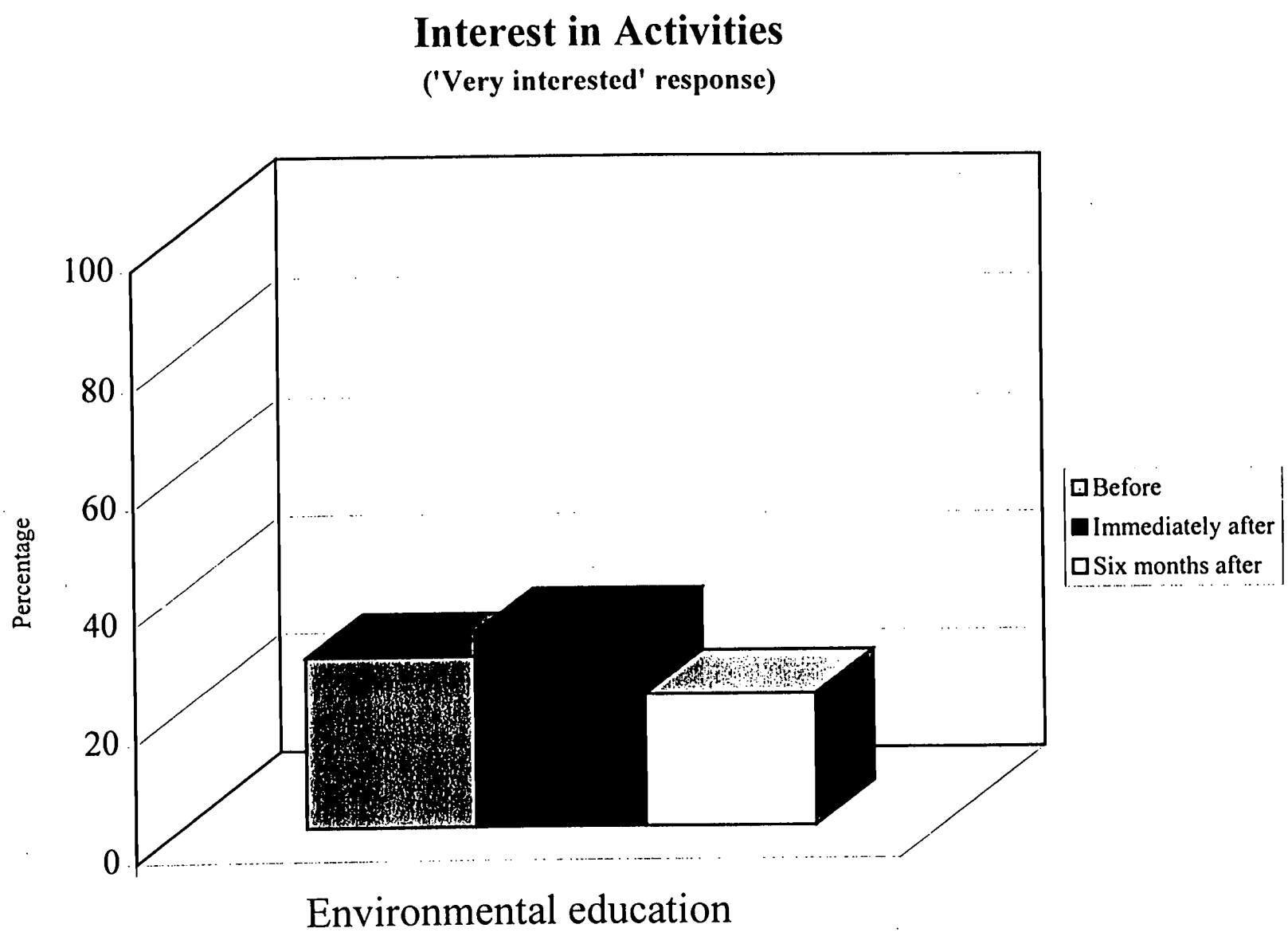
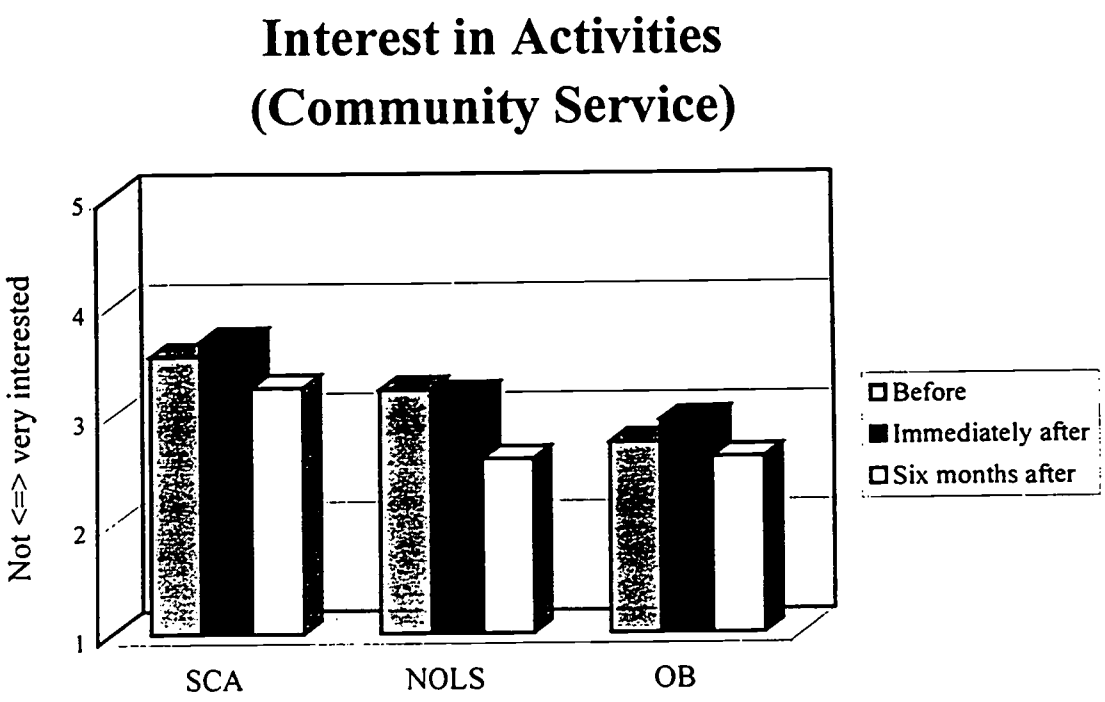

Interest in Activities
('Very interested' response)
100
80
60
40
20
0
Percentage
Before
Immediately after
Six months after
Environmental education

FIGURE 3-43


Interest in Activities
(Community Service)
Not <=> very interested
5
4
3
2
1
SCA
NOLS
OB
Before
Immediately after
Six months after

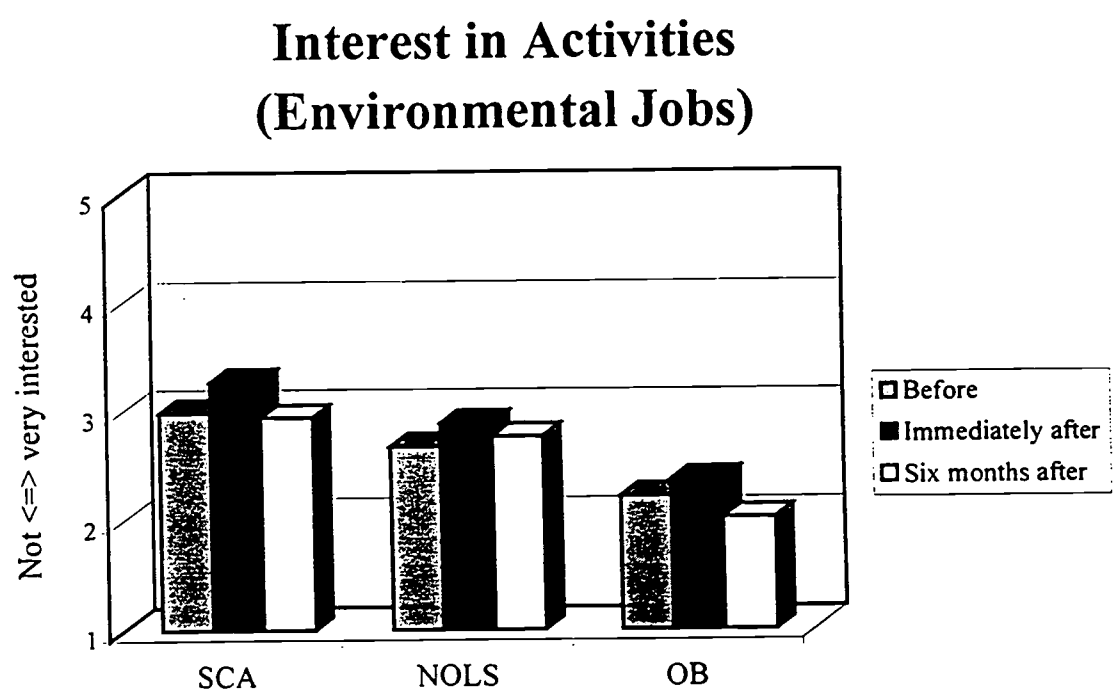

Interest in Activities
(Environmental Jobs)
Not <=> very interested
5
4
3
2
1
SCA
NOLS
OB
Before
Immediately after
Six months after

FIGURE 3-44

Interest in Activities (Environmental Education)

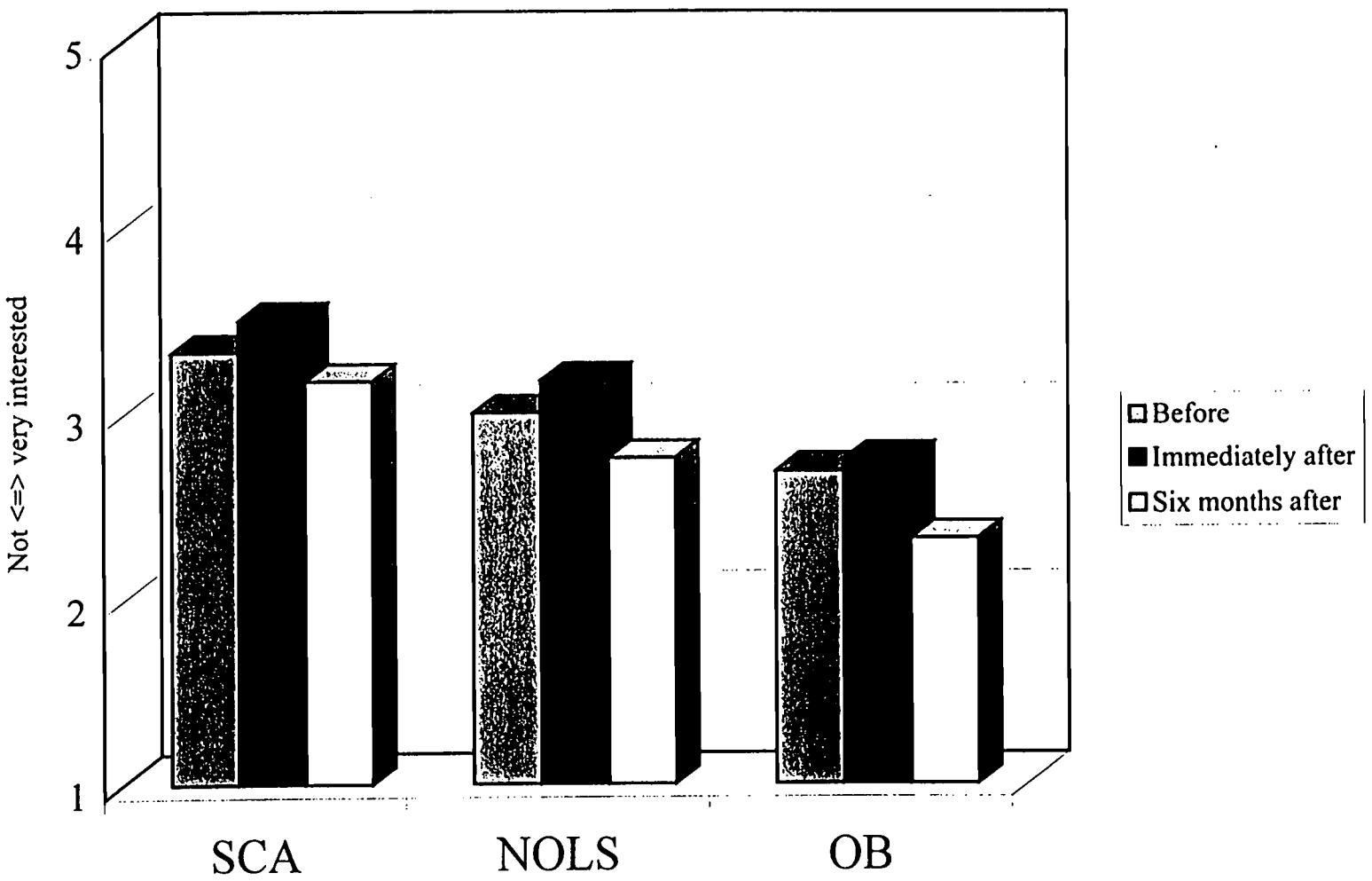
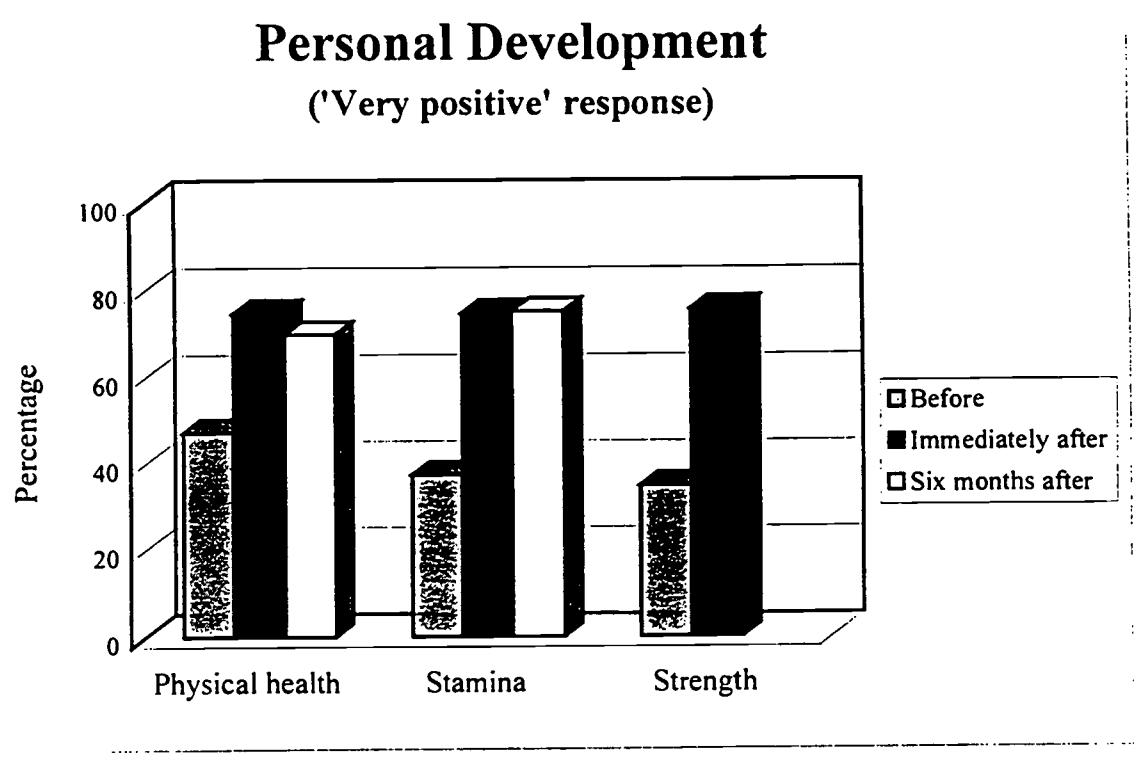


FIGURE 3-45


Personal Development
('Very positive' response)
Percentage
100
80
60
40
20
0
Physical health
Stamina
Strength
Before
Immediately after
Six months after

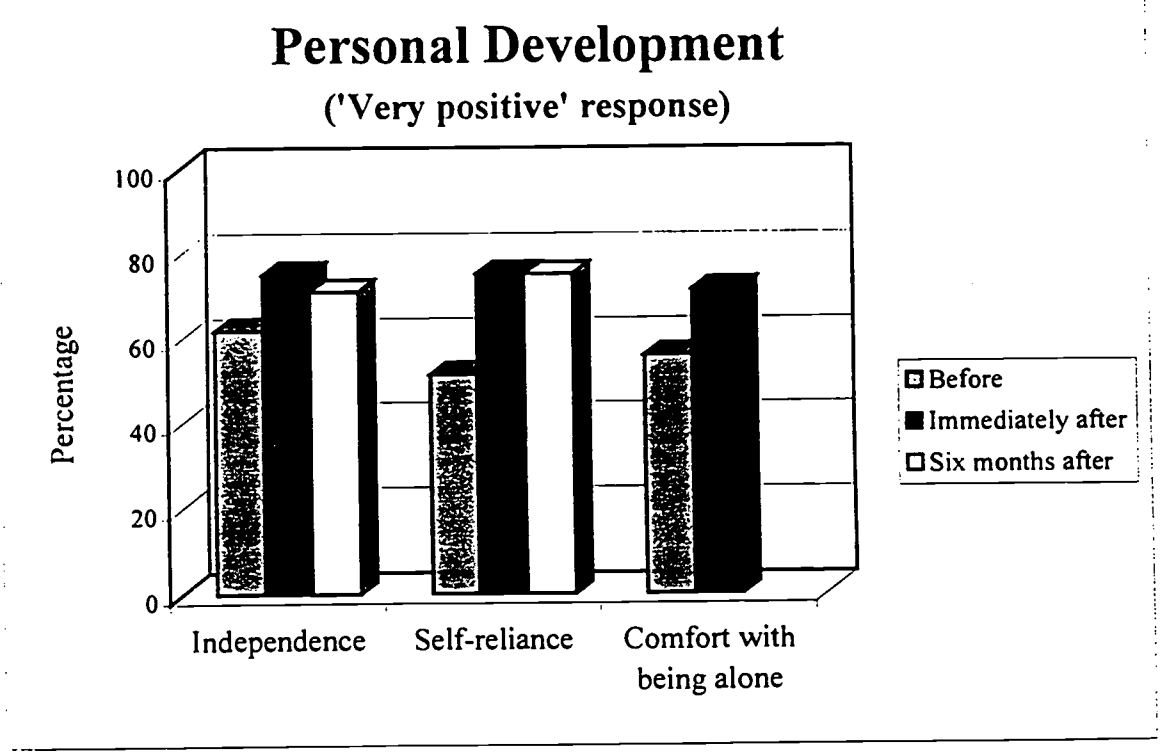
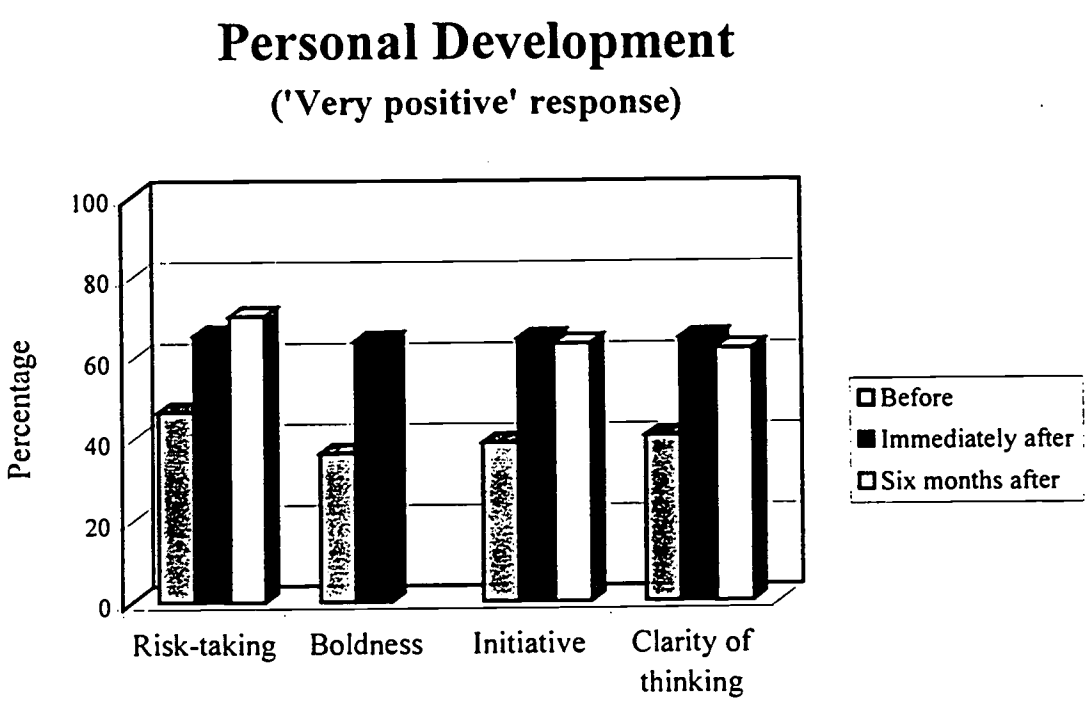

Personal Development
('Very positive' response)
Percentage
100
80
60
40
20
0
Independence
Self-reliance
Comfort with being alone
Before
Immediately after
Six months after

FIGURE 3-46



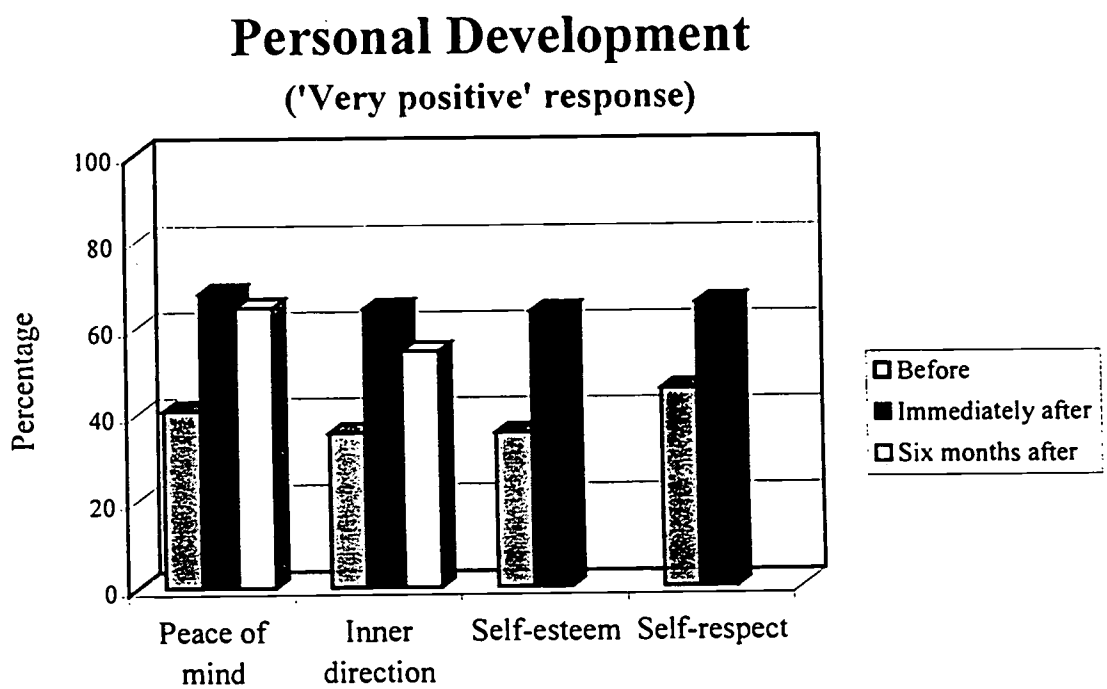
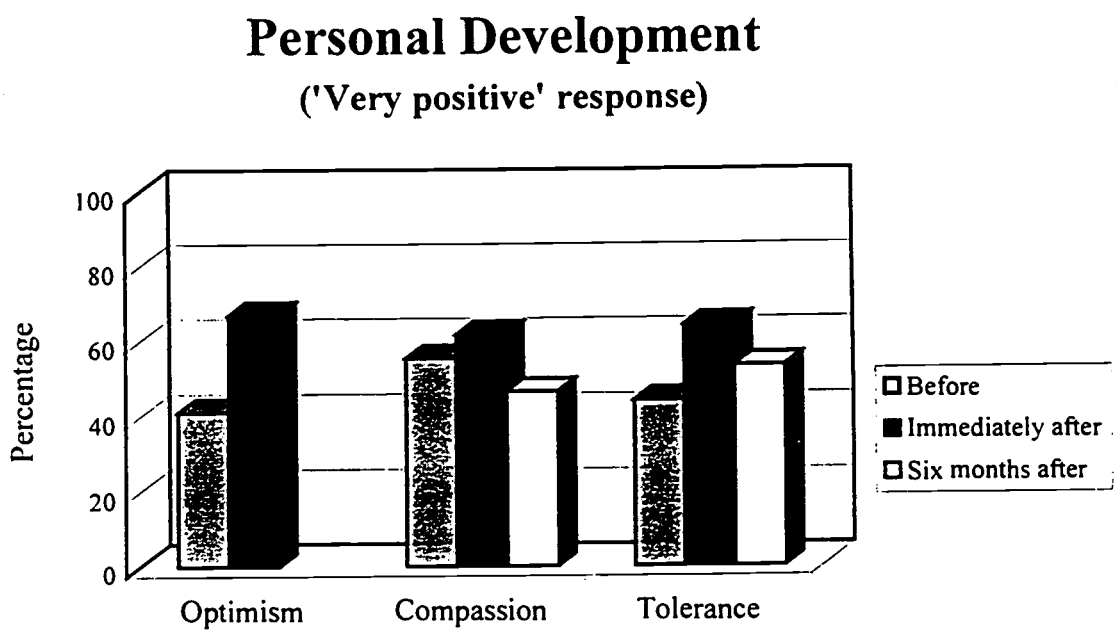


FIGURE 3-47


Personal Development
('Very positive' response)
Percentage
100
80
60
40
20
0
Optimism
Compassion
Tolerance
Before
Immediately after
Six months after

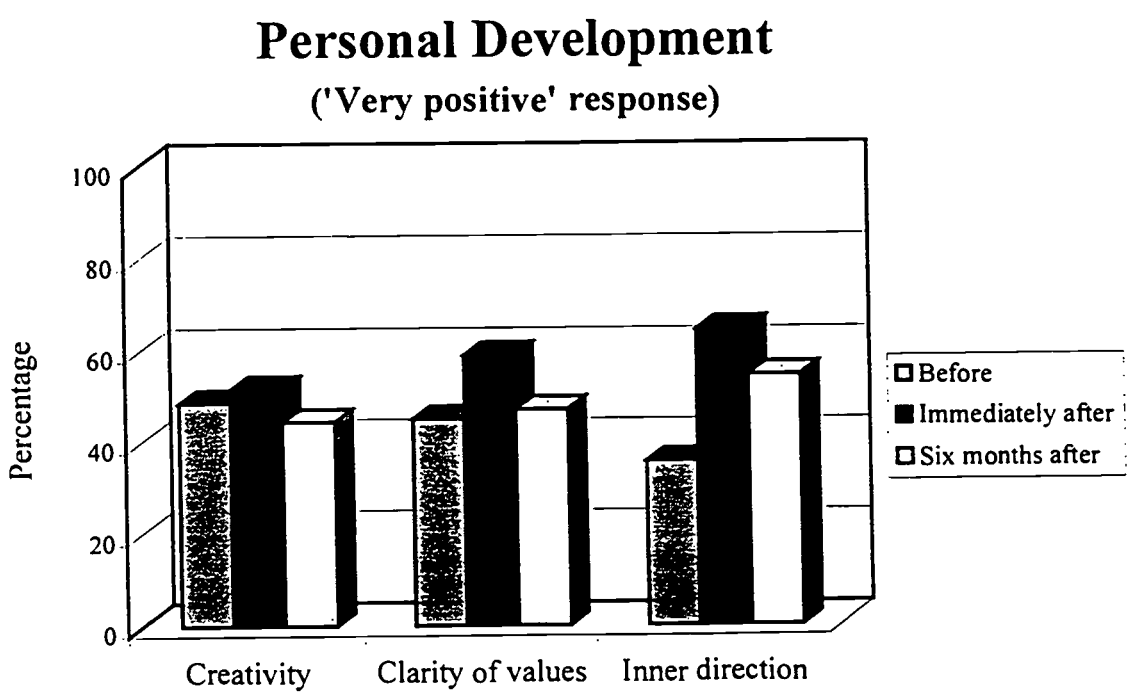
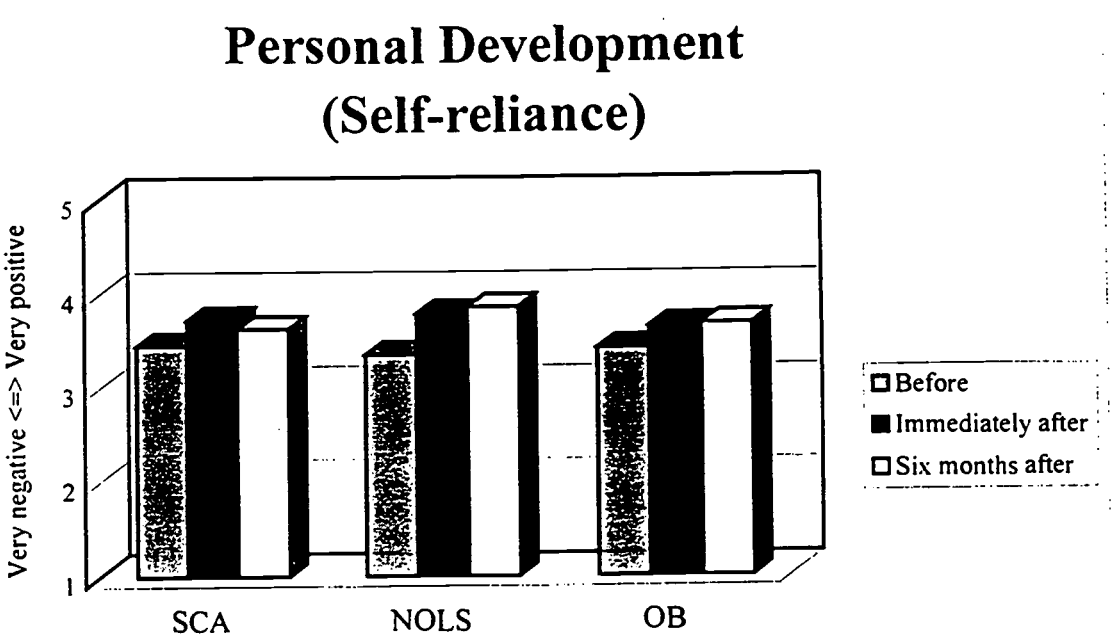

Personal Development
('Very positive' response)
Percentage
100
80
60
40
20
0
Creativity
Clarity of values
Inner direction
Before
Immediately after
Six months after

FIGURE 3-48


Personal Development
(Self-reliance)
Very negative <=> Very positive
5
4
3
2
1
SCA
NOLS
OB
Before
Immediately after
Six months after

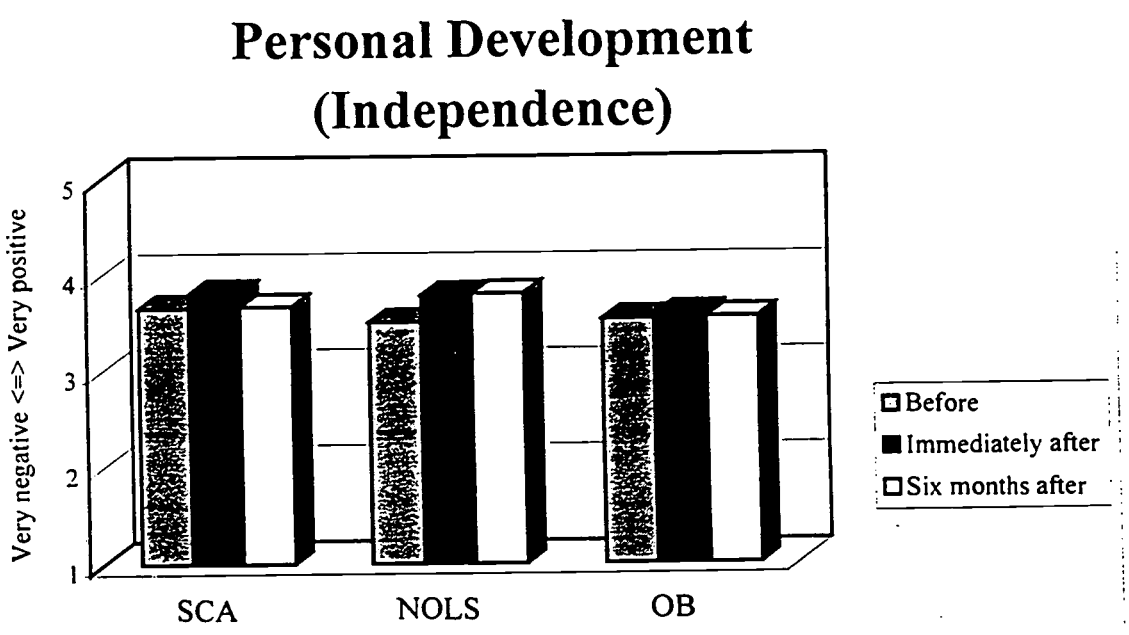
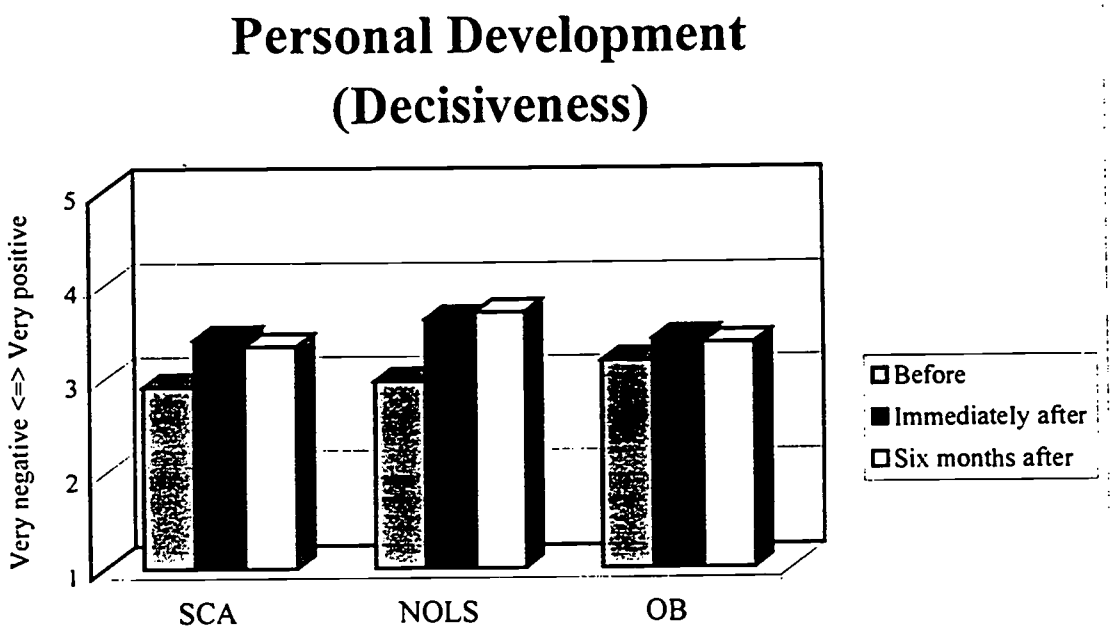

Personal Development
(Independence)
Very negative <=> Very positive
5
4
3
2
1
SCA
NOLS
OB
Before
Immediately after
Six months after

FIGURE 3-49


Personal Development
(Decisiveness)
Very negative <=> Very positive
5
4
3
2
1
SCA
NOLS
OB
Before
Immediately after
Six months after

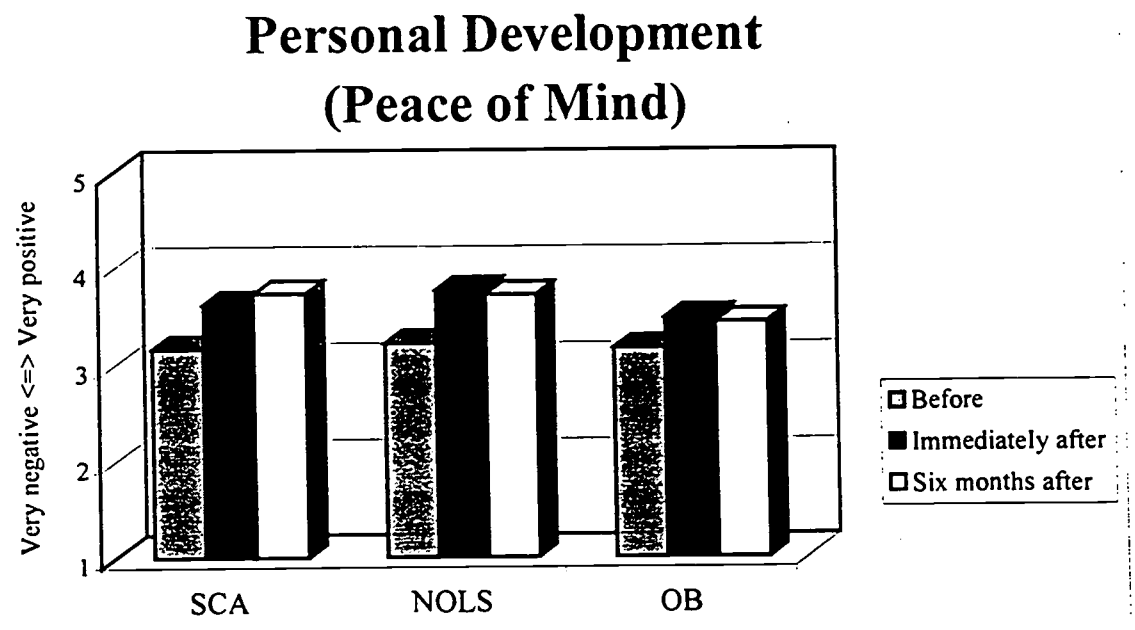
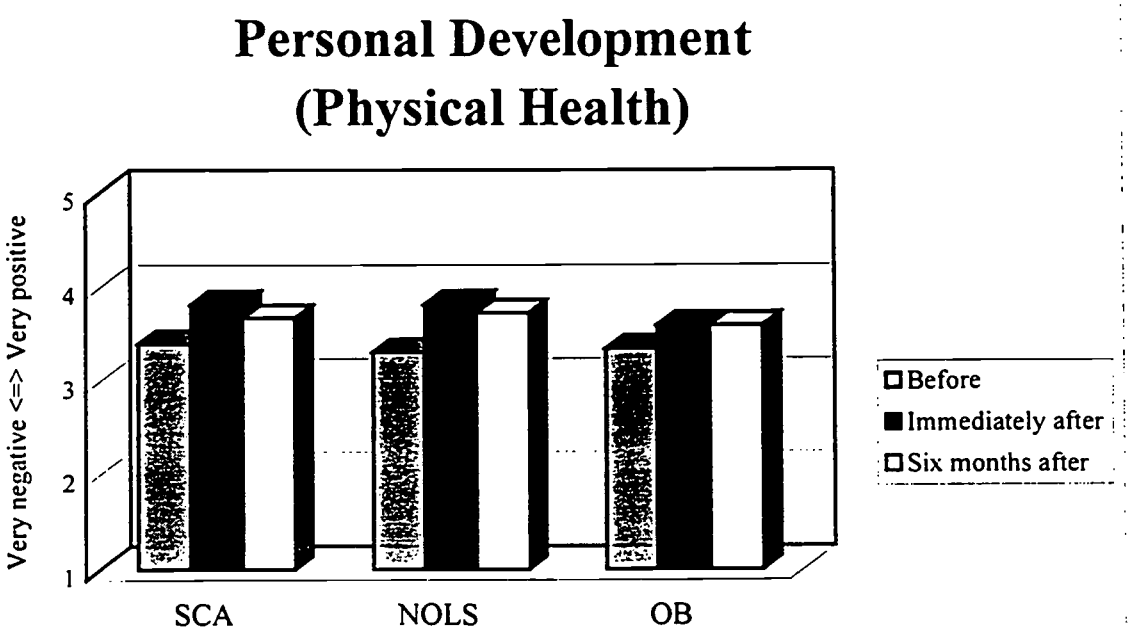

Personal Development
(Peace of Mind)
Very negative <=> Very positive
5
4
3
2
1
SCA
NOLS
OB
Before
Immediately after
Six months after

FIGURE 3-50


Personal Development
(Physical Health)
Very negative <=> Very positive
5
4
3
2
1
SCA
NOLS
OB
Before
Immediately after
Six months after

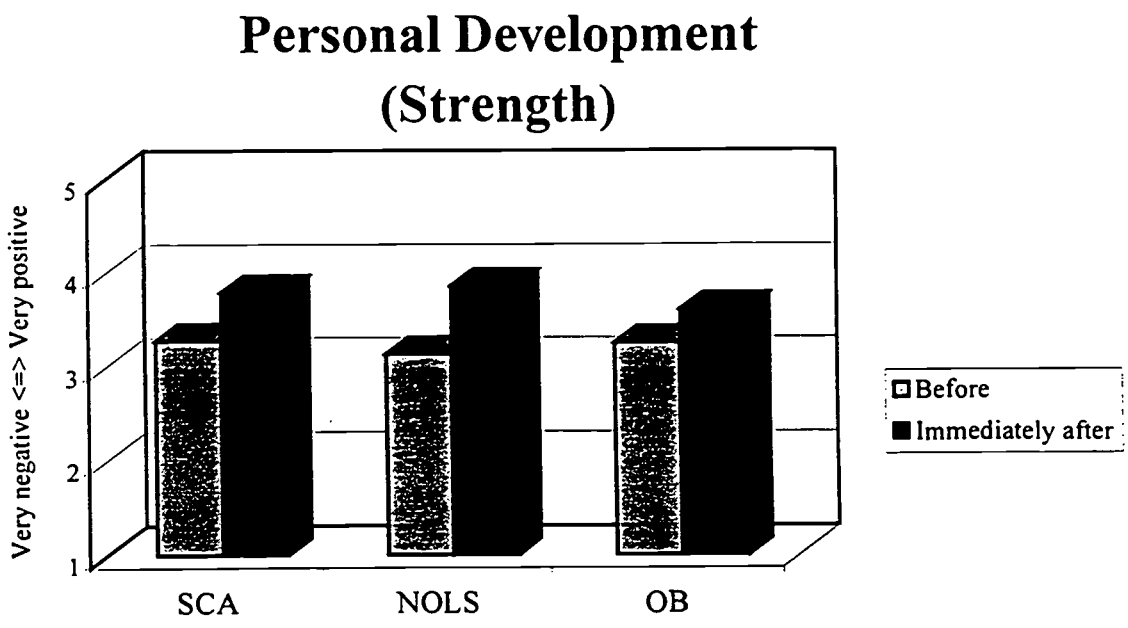
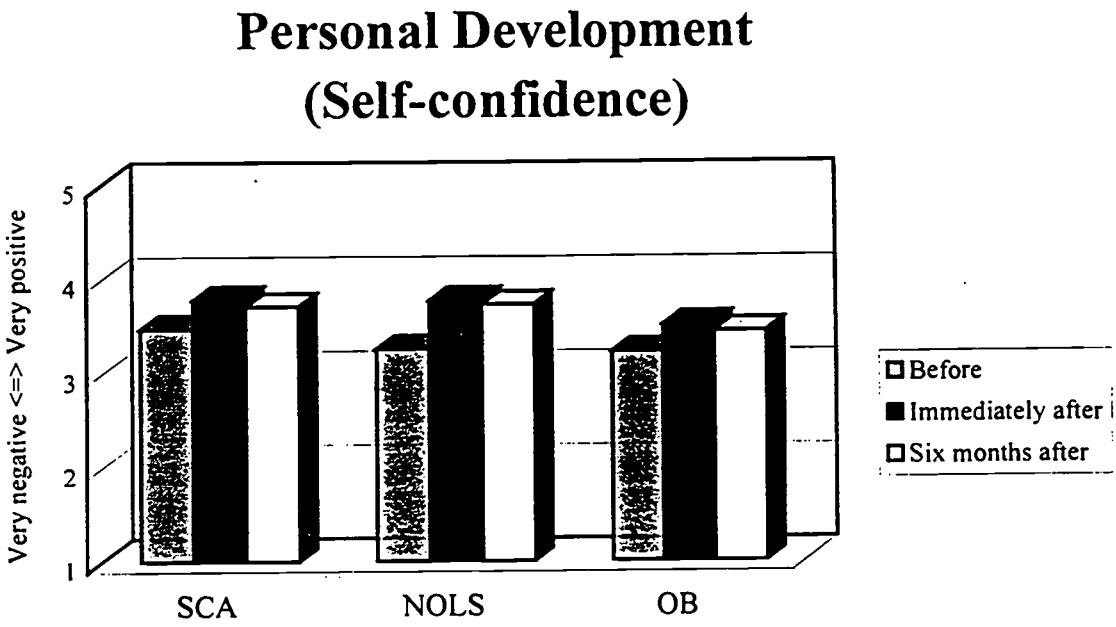

Personal Development
(Strength)
Very negative <=> Very positive
5
4
3
2
1
SCA
NOLS
OB
Before
Immediately after

FIGURE 3-51


Personal Development
(Self-confidence)
Very negative <=> Very positive
5
4
3
2
1
SCA
NOLS
OB
Before
Immediately after
Six months after

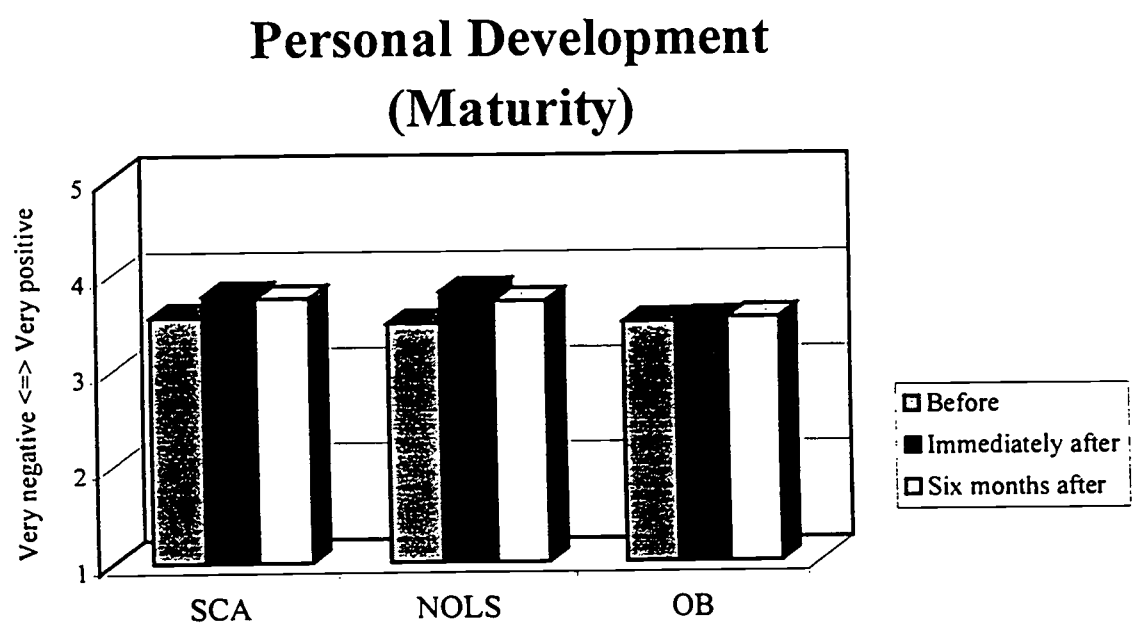
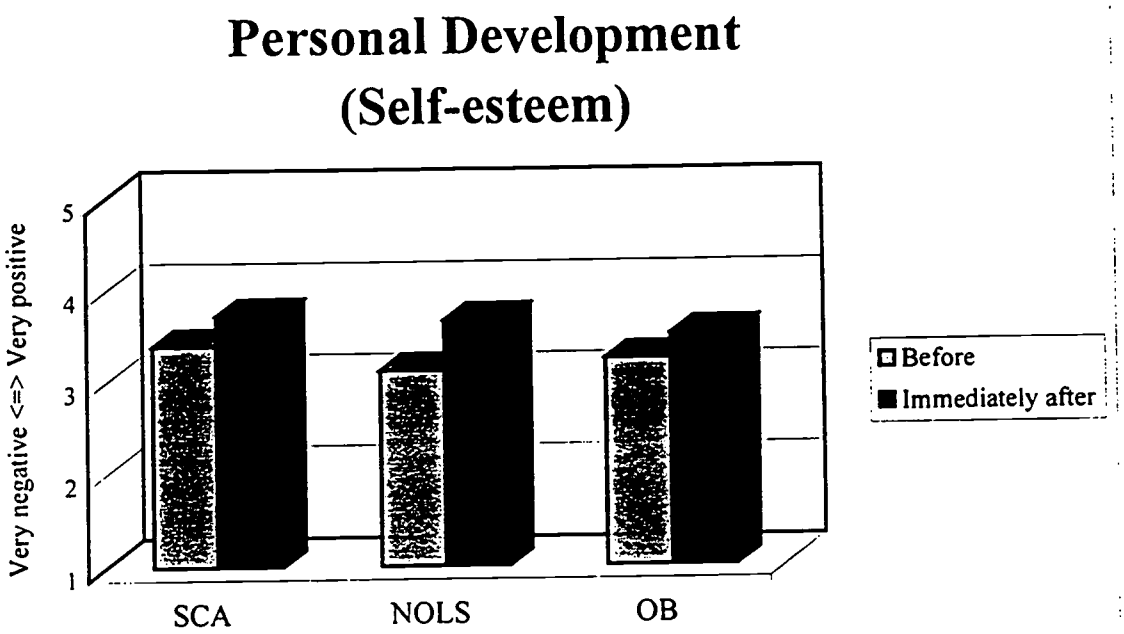

Personal Development
(Maturity)
Very negative <=> Very positive
5
4
3
2
1
SCA
NOLS
OB
Before
Immediately after
Six months after

FIGURE 3-52


Personal Development
(Self-esteem)
Very negative <=> Very positive
5
4
3
2
1
SCA
NOLS
OB
Before
Immediately after

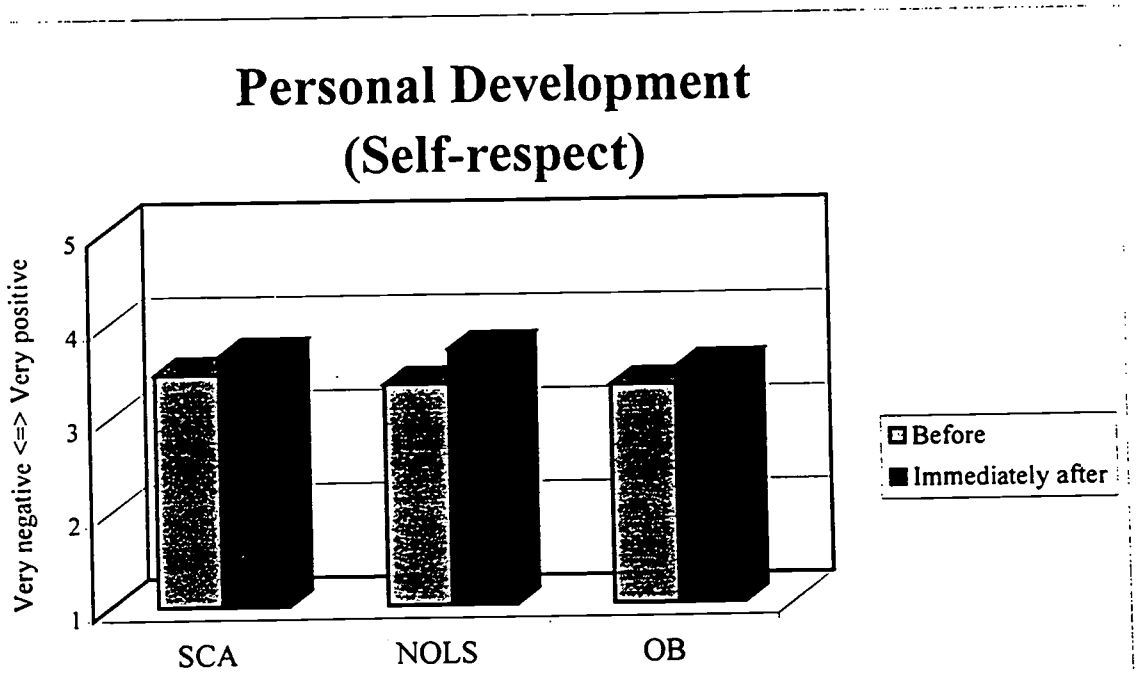
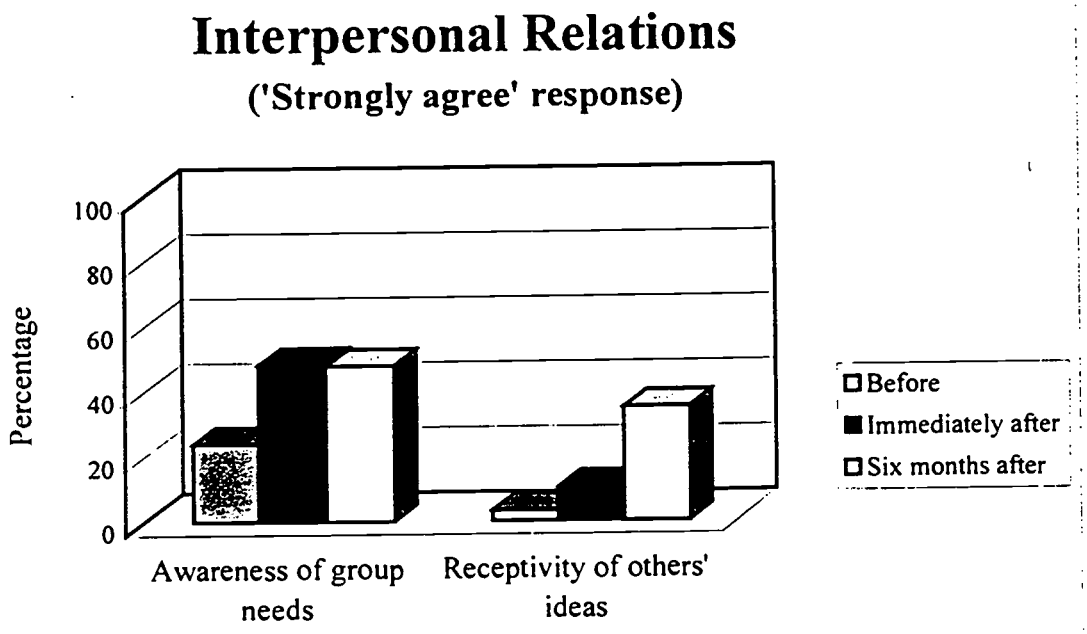

Personal Development
(Self-respect)
Very negative <=> Very positive
5
4
3
2
1
SCA
NOLS
OB
Before
Immediately after

FIGURE 3-53


Interpersonal Relations
('Strongly agree' response)
Percentage
100
80
60
40
20
0
Awareness of group needs
Receptivity of others' ideas
Before
Immediately after
Six months after

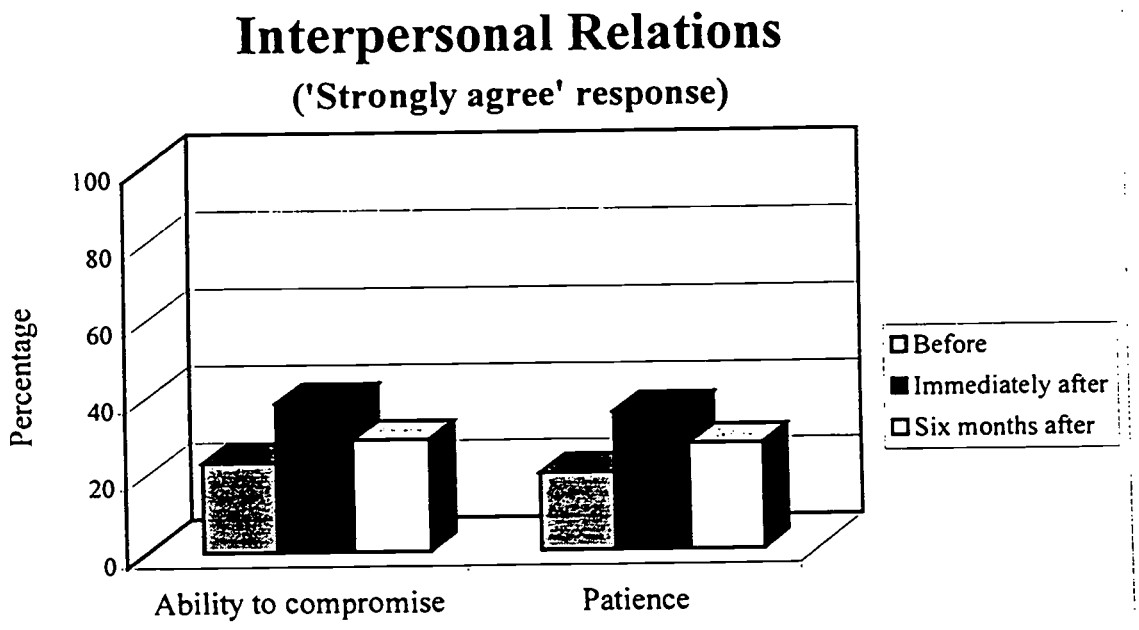
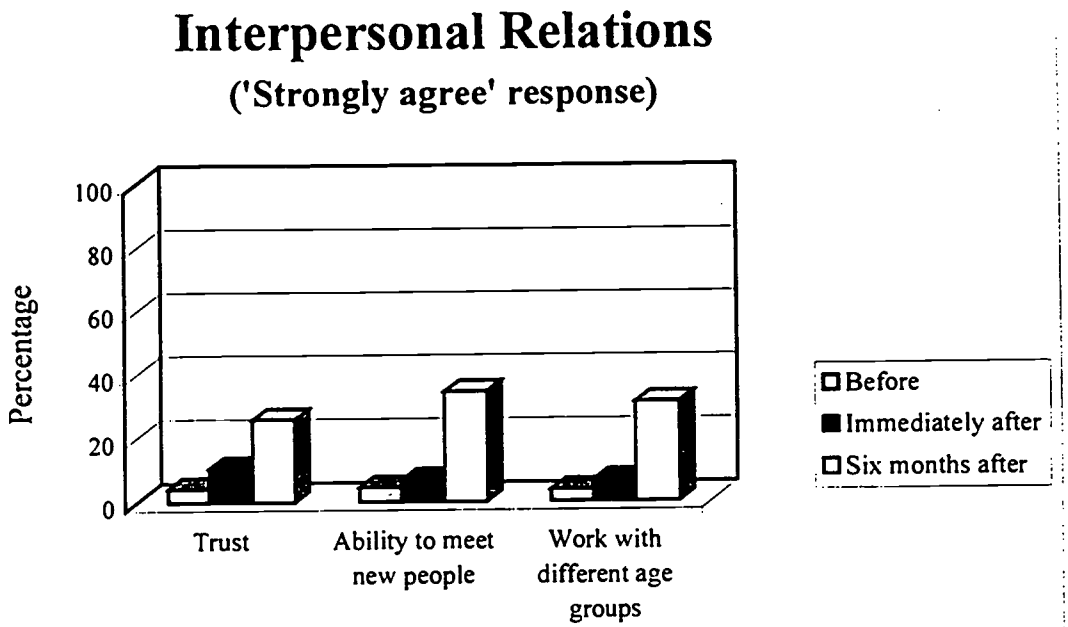

Interpersonal Relations
('Strongly agree' response)
Percentage
100
80
60
40
20
0
Ability to compromise
Patience
Before
Immediately after
Six months after

FIGURE 3-54


Interpersonal Relations
('Strongly agree' response)
Percentage
100
80
60
40
20
0
Trust
Ability to meet new people
Work with different age groups
Before
Immediately after
Six months after

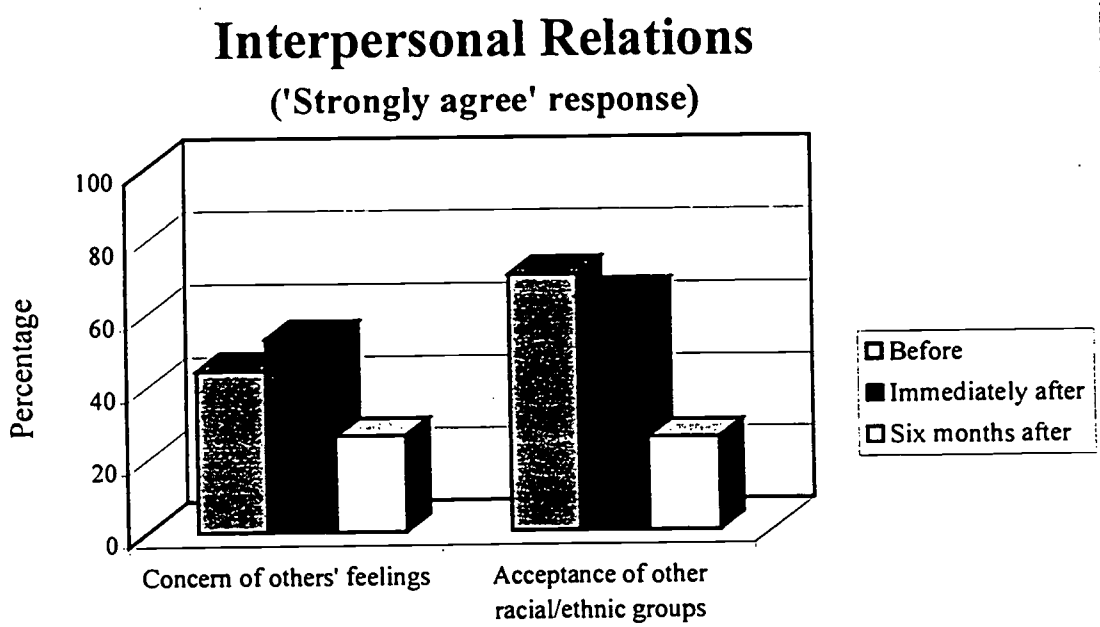
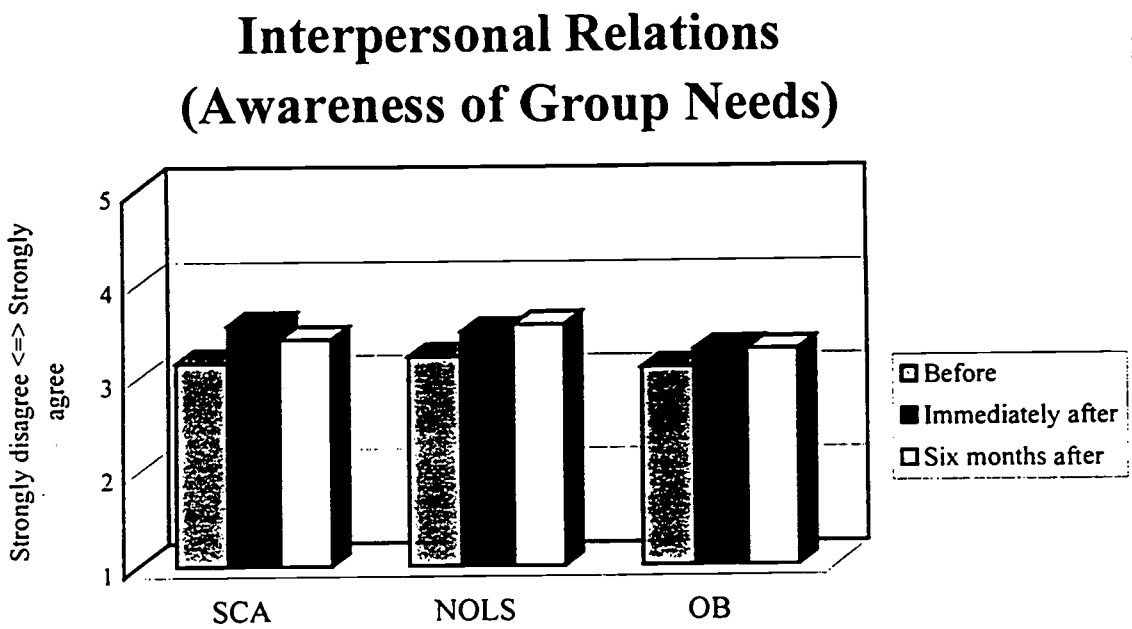

Interpersonal Relations
('Strongly agree' response)
Percentage
100
80
60
40
20
0
Concern of others' feelings
Acceptance of other racial/ethnic groups
Before
Immediately after
Six months after

FIGURE 3-55


Interpersonal Relations
(Awareness of Group Needs)
Strongly disagree <=> Strongly agree
5
4
3
2
1
SCA
NOLS
OB
Before
Immediately after
Six months after

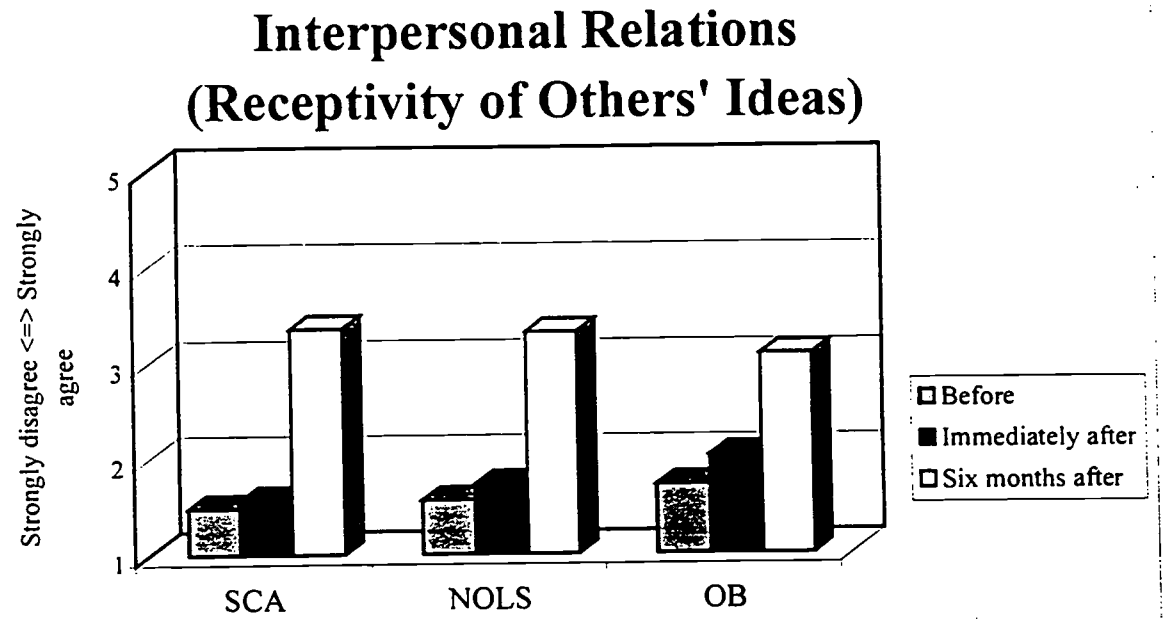
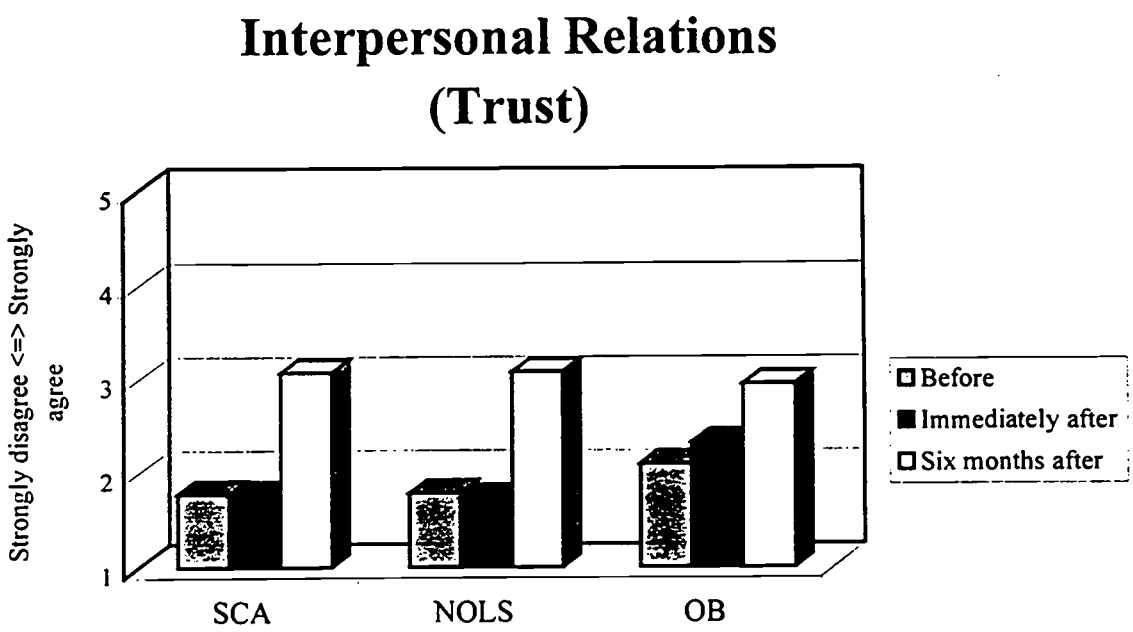

Interpersonal Relations
(Receptivity of Others' Ideas)
Strongly disagree <=> Strongly agree
5
4
3
2
1
SCA
NOLS
OB
Before
Immediately after
Six months after

FIGURE 3-56



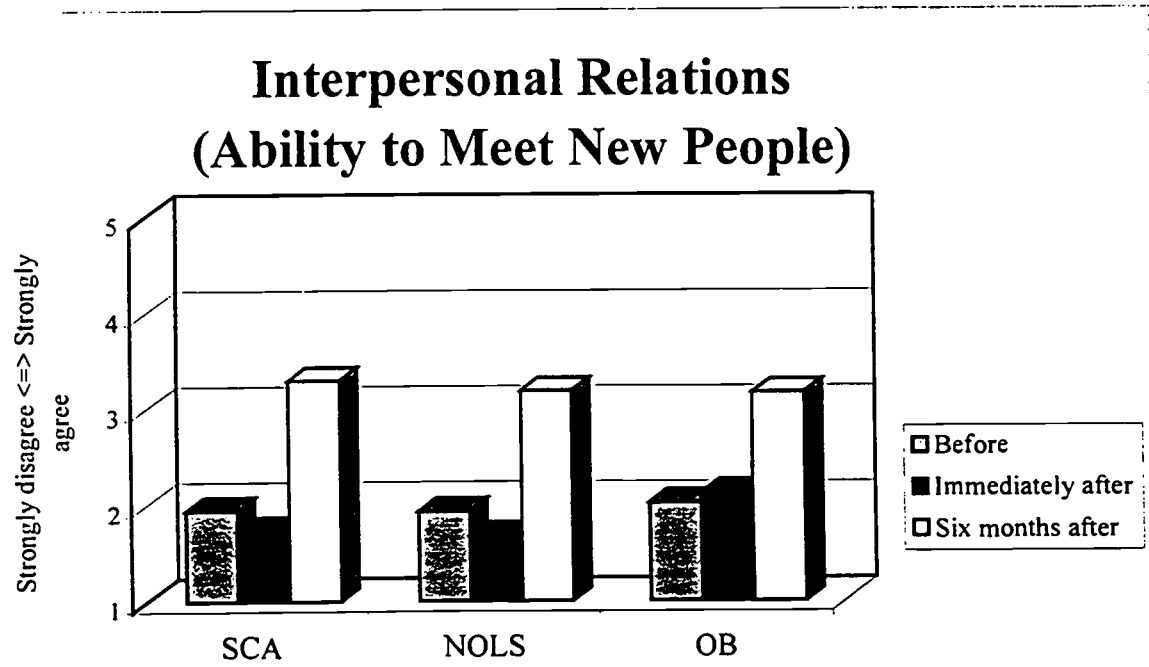
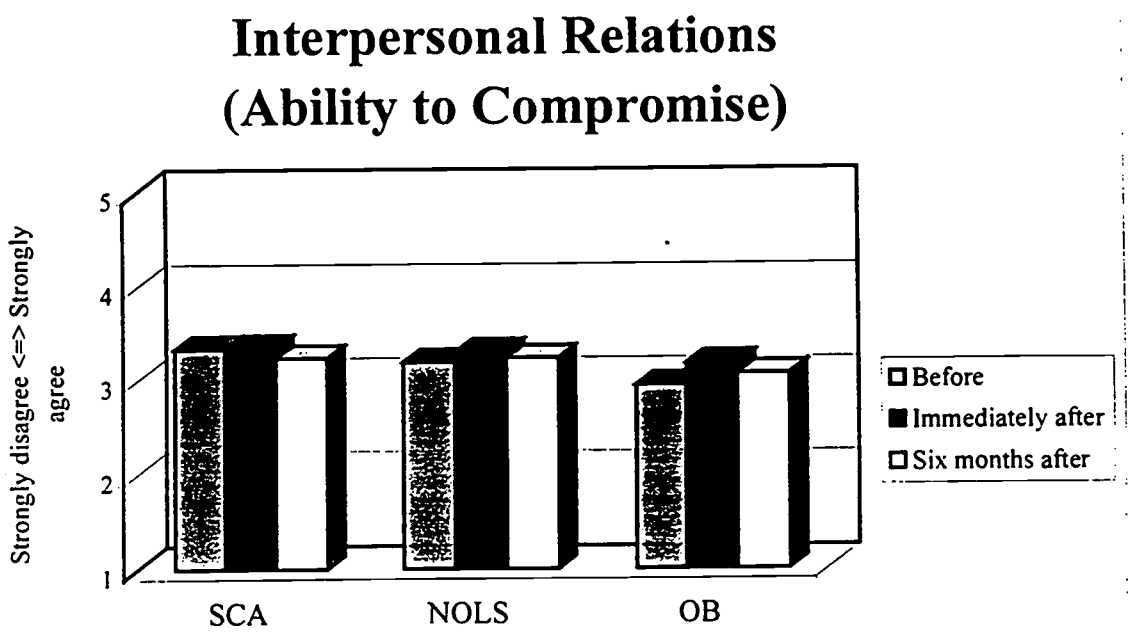


FIGURE 3-57


Interpersonal Relations
(Ability to Compromise)
Strongly disagree <=> Strongly agree
5
4
3
2
1
SCA
NOLS
OB
Before
Immediately after
Six months after

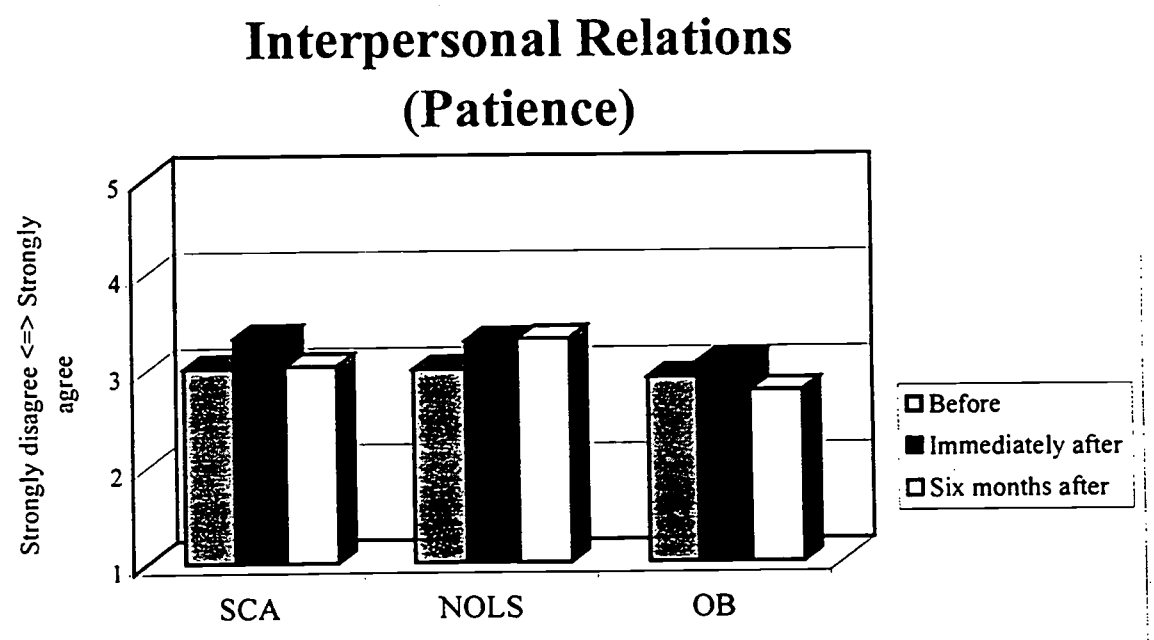
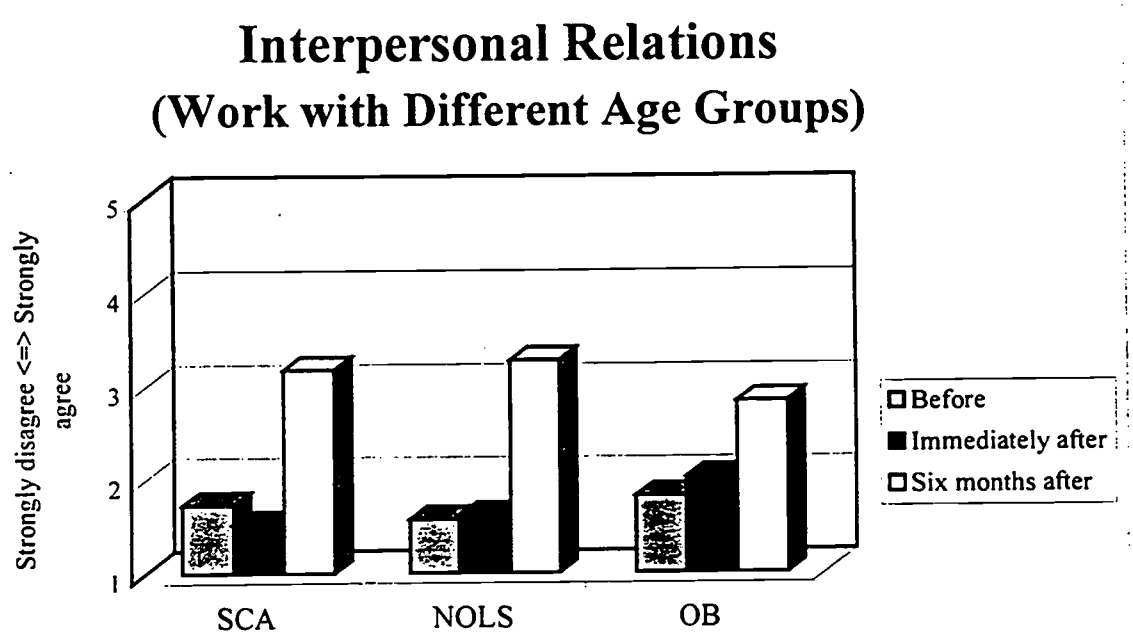

Interpersonal Relations
(Patience)
Strongly disagree <=> Strongly agree
5
4
3
2
1
SCA
NOLS
OB
Before
Immediately after
Six months after

FIGURE 3-58


Interpersonal Relations
(Work with Different Age Groups)
Strongly disagree <=> Strongly agree
5
4
3
2
1
SCA
NOLS
OB
Before
Immediately after
Six months after

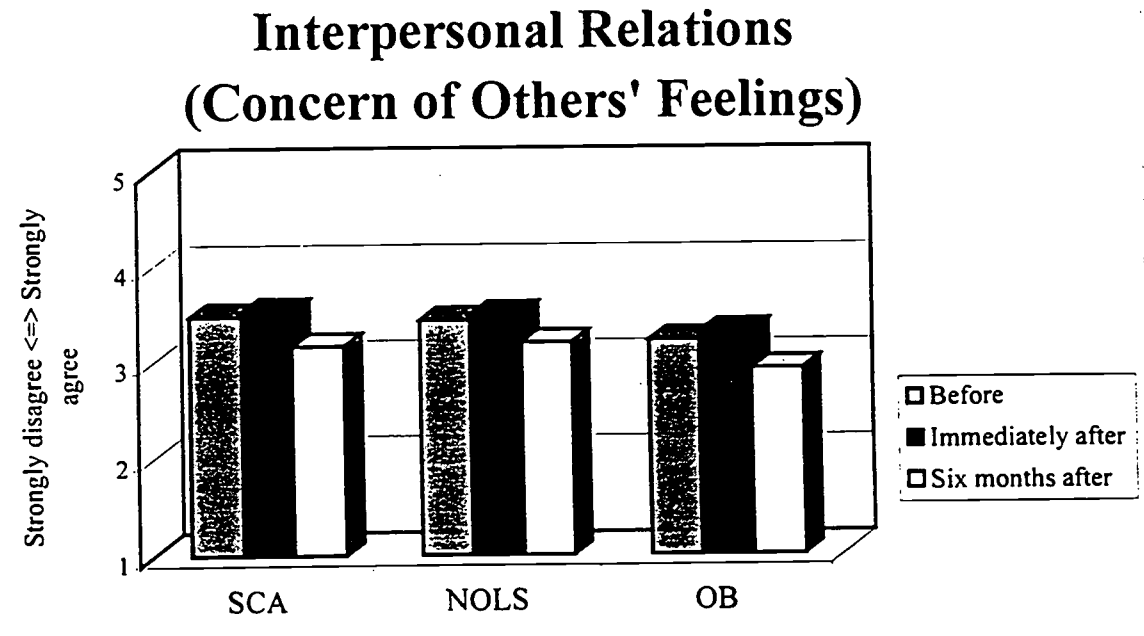

Interpersonal Relations
(Concern of Others' Feelings)
Strongly disagree <=> Strongly agree
5
4
3
2
1
SCA
NOLS
OB
Before
Immediately after
Six months after

FIGURE 3-59

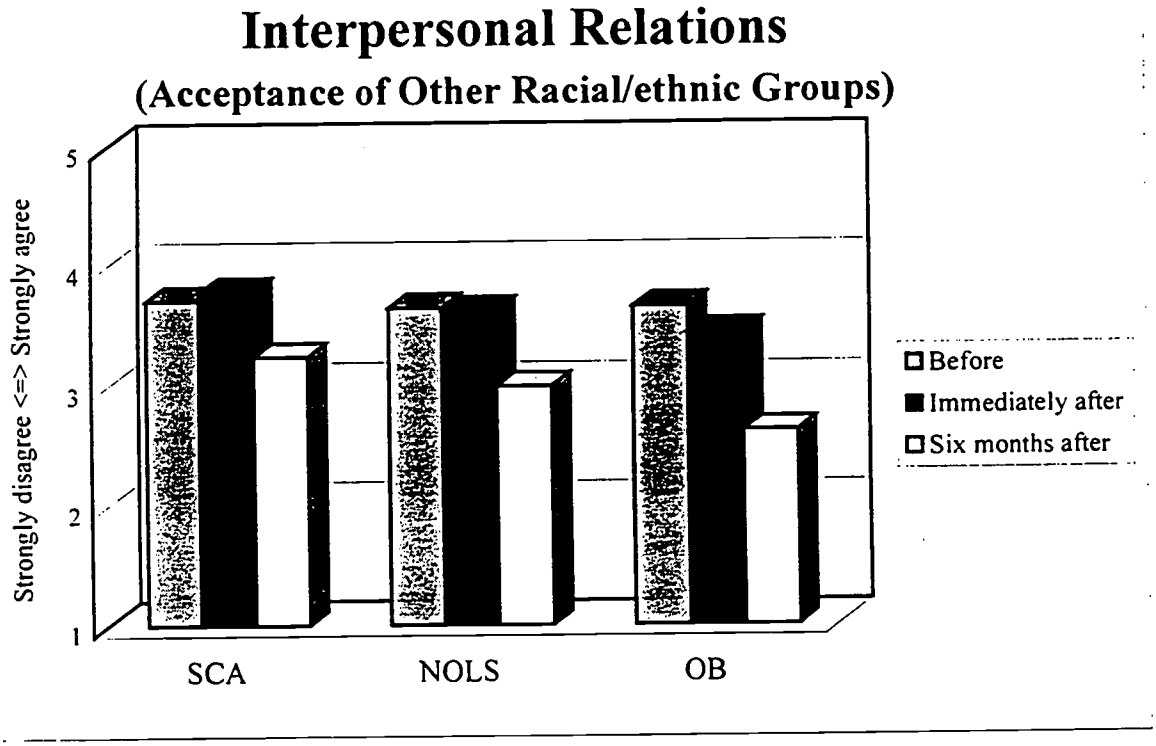
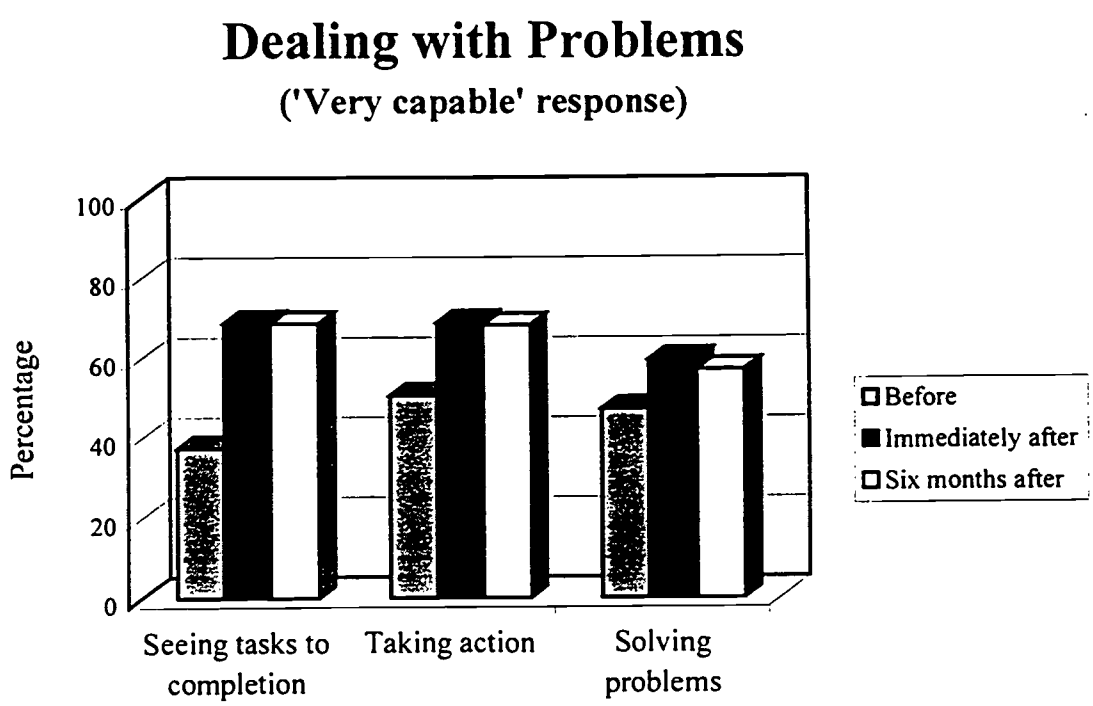

Interpersonal Relations
(Acceptance of Other Racial/ethnic Groups)
Strongly disagree <=> Strongly agree
5
4
3
2
1
SCA
NOLS
OB
Before
Immediately after
Six months after

FIGURE 3-60


Dealing with Problems
('Very capable' response)
Percentage
100
80
60
40
20
0
Seeing tasks to completion
Taking action
Solving problems
Before
Immediately after
Six months after

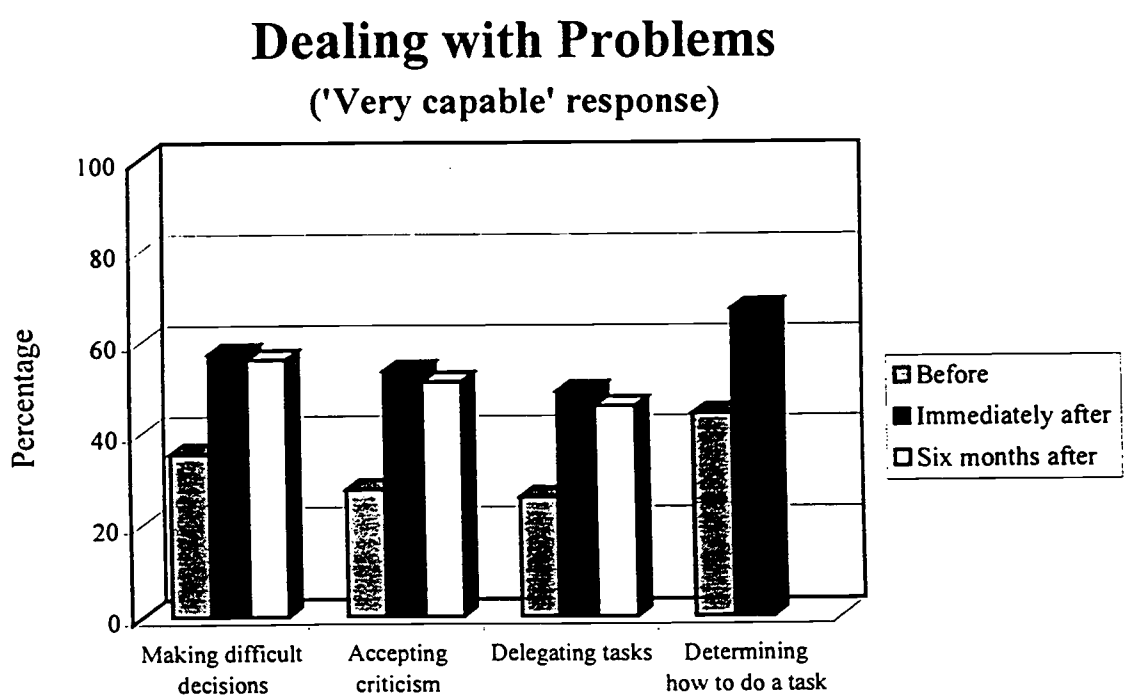
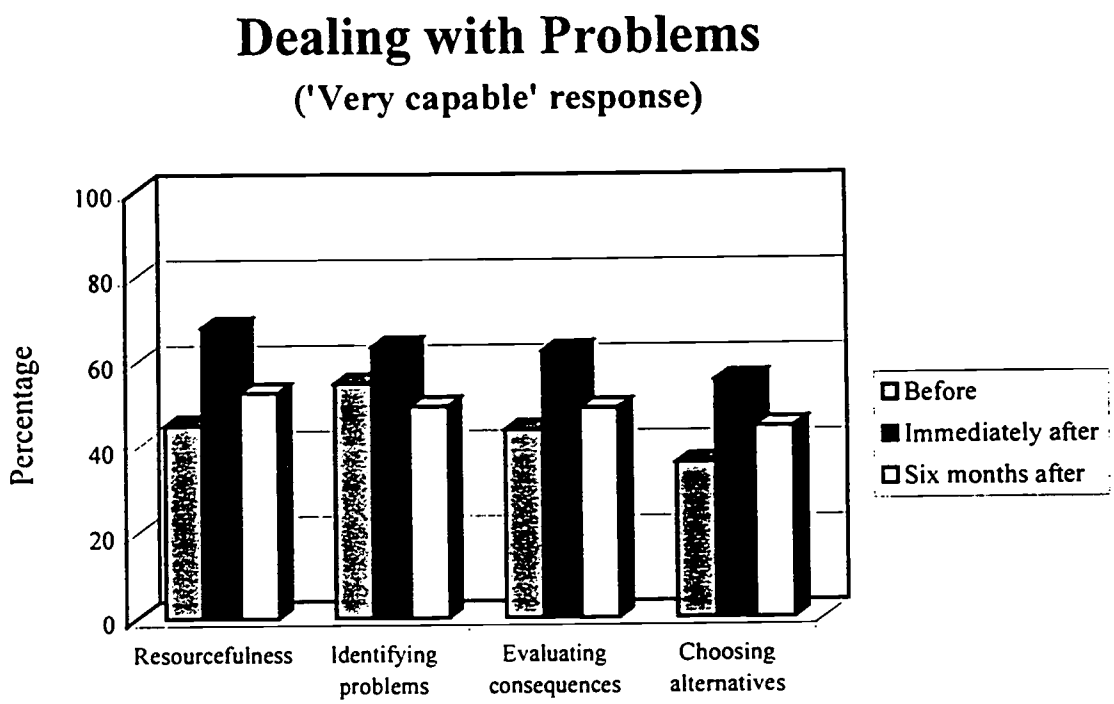

Dealing with Problems
('Very capable' response)
Percentage
100
80
60
40
20
0
Making difficult decisions
Accepting criticism
Delegating tasks
Determining how to do a task
Before
Immediately after
Six months after

FIGURE 3-61


Dealing with Problems
('Very capable' response)
Percentage
100
80
60
40
20
0
Resourcefulness
Identifying problems
Evaluating consequences
Choosing alternatives
Before
Immediately after
Six months after

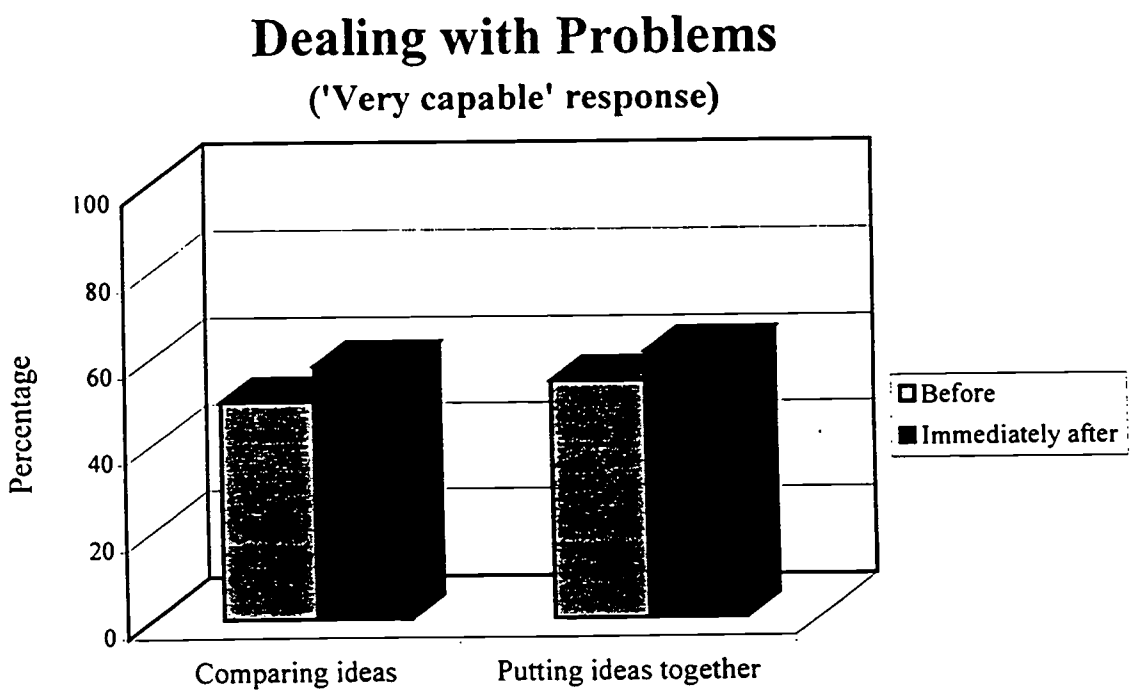
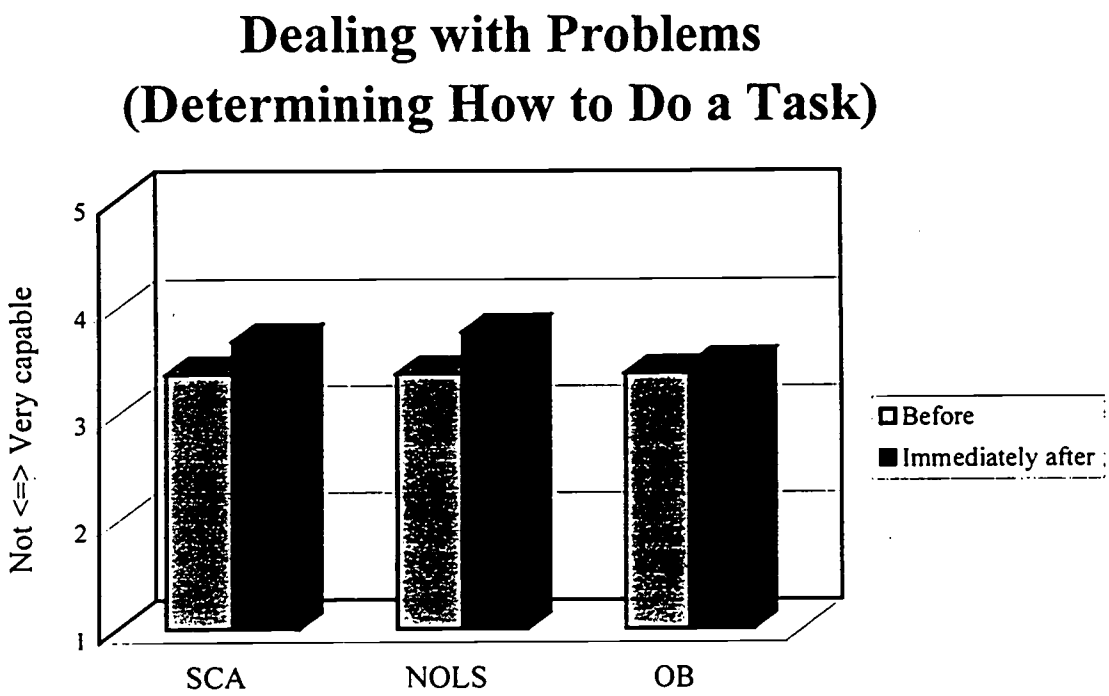

Dealing with Problems
('Very capable' response)
Percentage
100
80
60
40
20
0
Comparing ideas
Putting ideas together
Before
Immediately after

FIGURE 3-62


Dealing with Problems
(Determining How to Do a Task)
Not <=> Very capable
5
4
3
2
1
SCA
NOLS
OB
Before
Immediately after

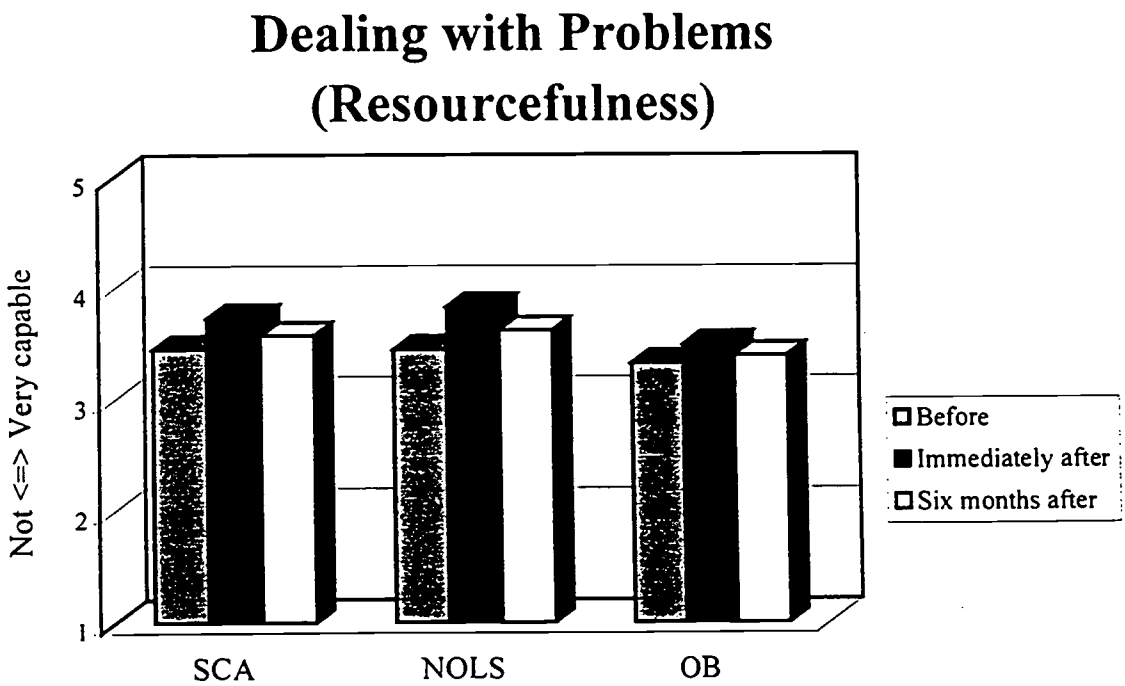
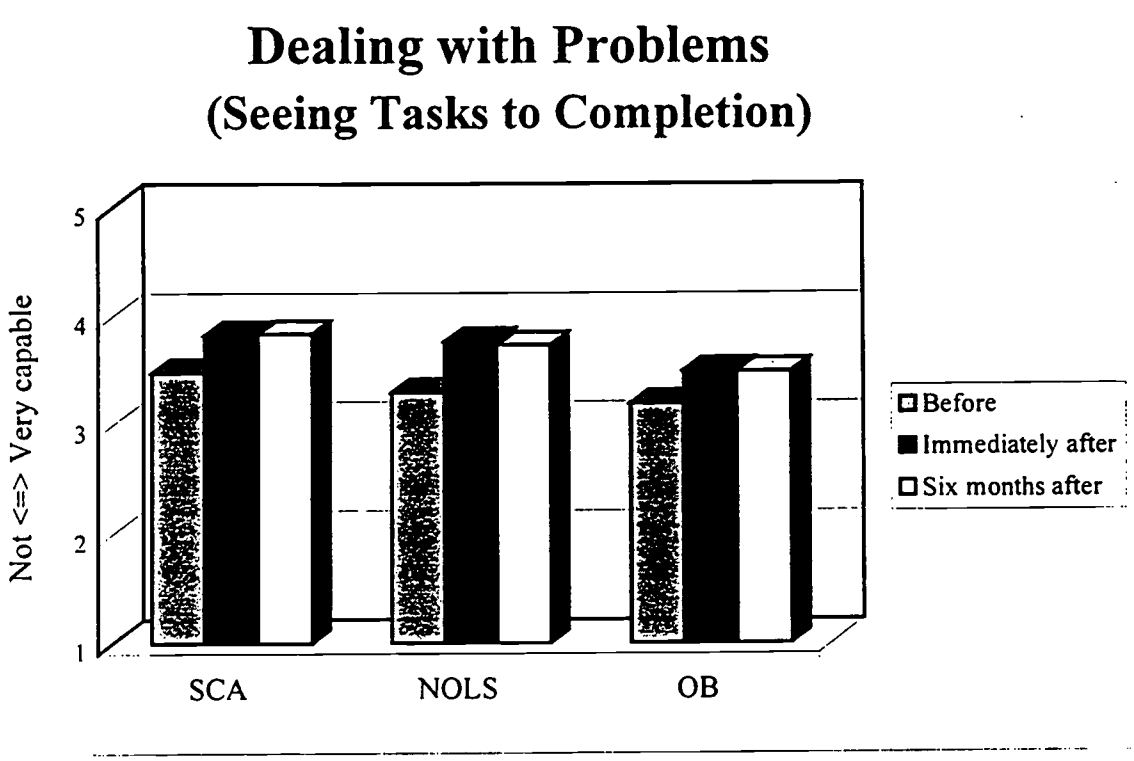

Dealing with Problems
(Resourcefulness)
Not <=> Very capable
5
4
3
2
1
SCA
NOLS
OB
Before
Immediately after
Six months after

FIGURE 3-63


Dealing with Problems
(Seeing Tasks to Completion)
Not <=> Very capable
5
4
3
2
1
SCA
NOLS
OB
Before
Immediately after
Six months after

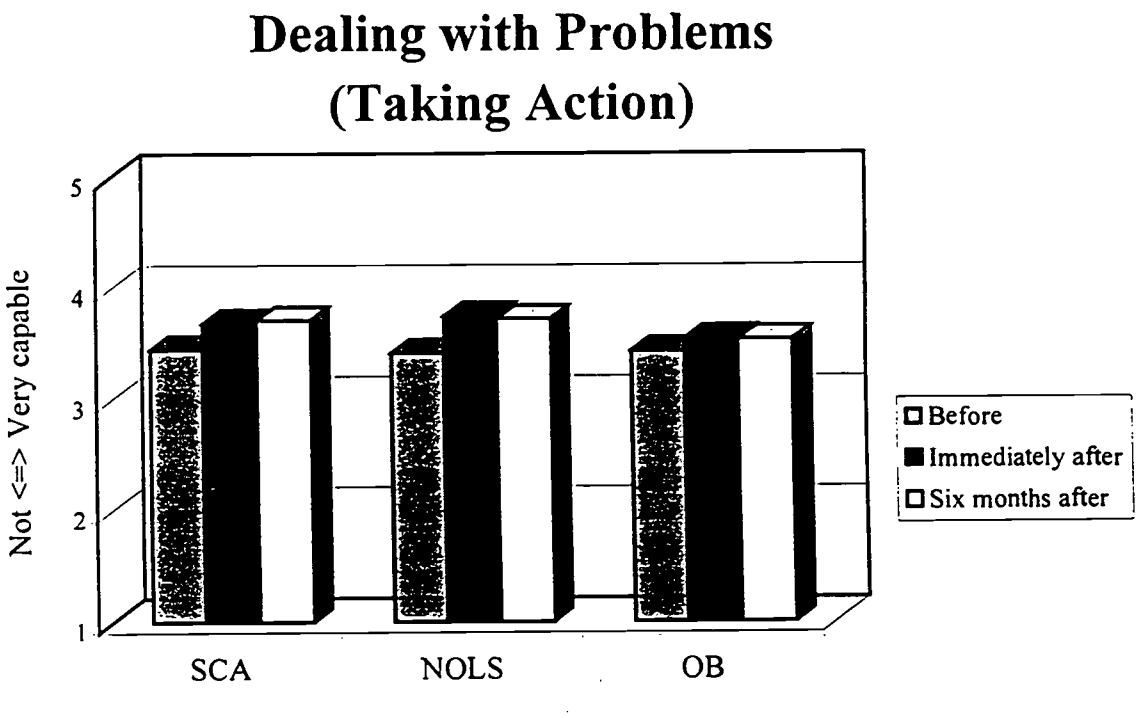
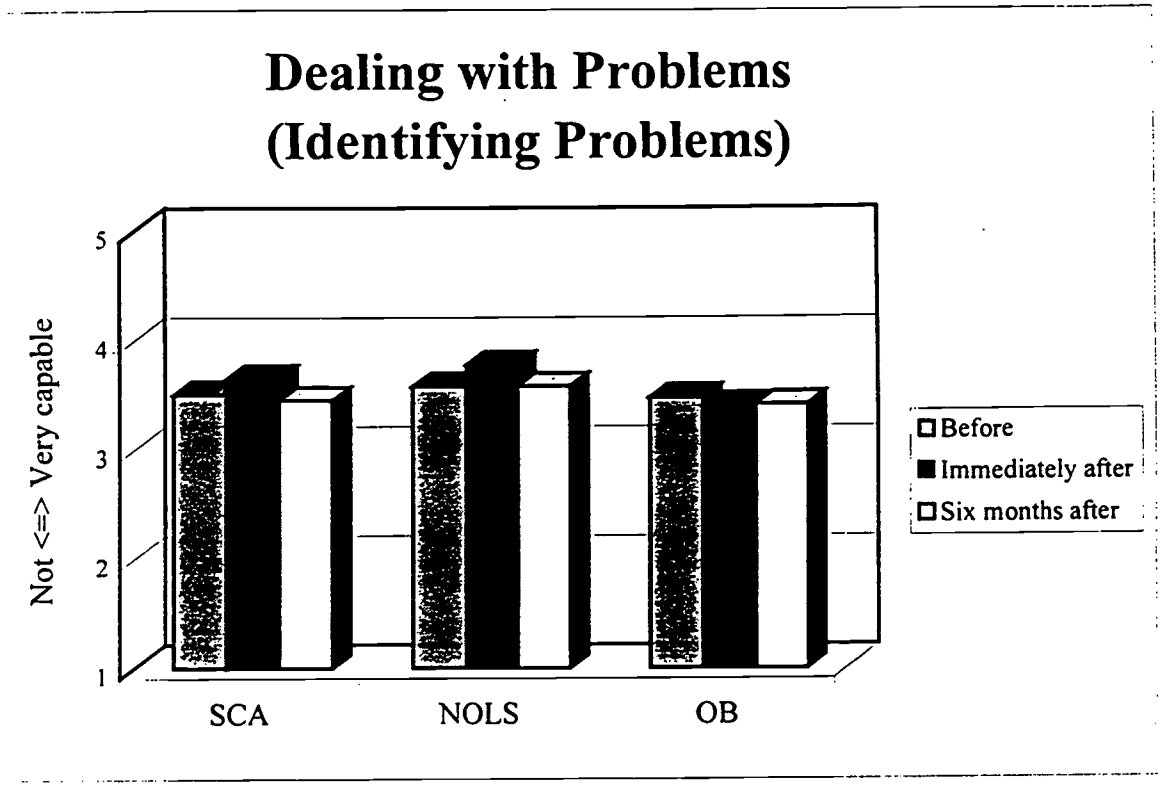

Dealing with Problems
(Taking Action)
Not <=> Very capable
5
4
3
2
1
SCA
NOLS
OB
Before
Immediately after
Six months after

FIGURE 3-64


Dealing with Problems
(Identifying Problems)
Not <=> Very capable
5
4
3
2
1
SCA
NOLS
OB
Before
Immediately after
Six months after

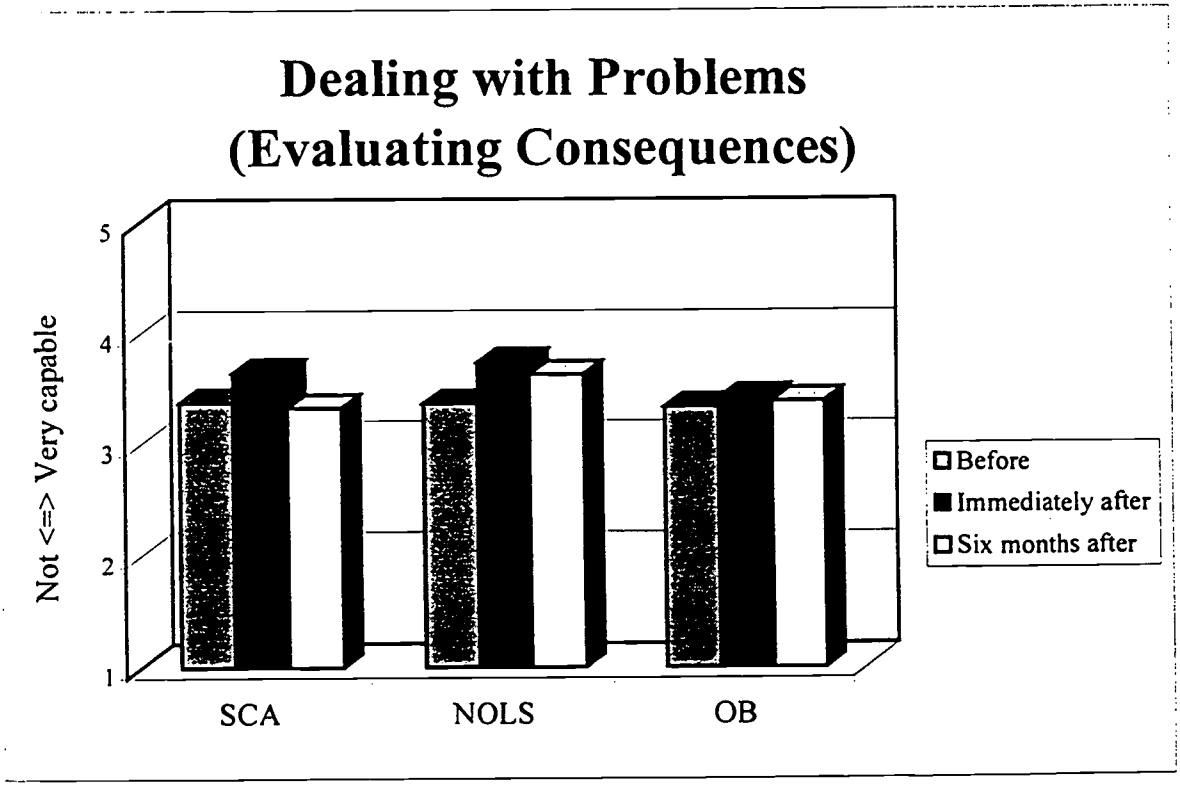
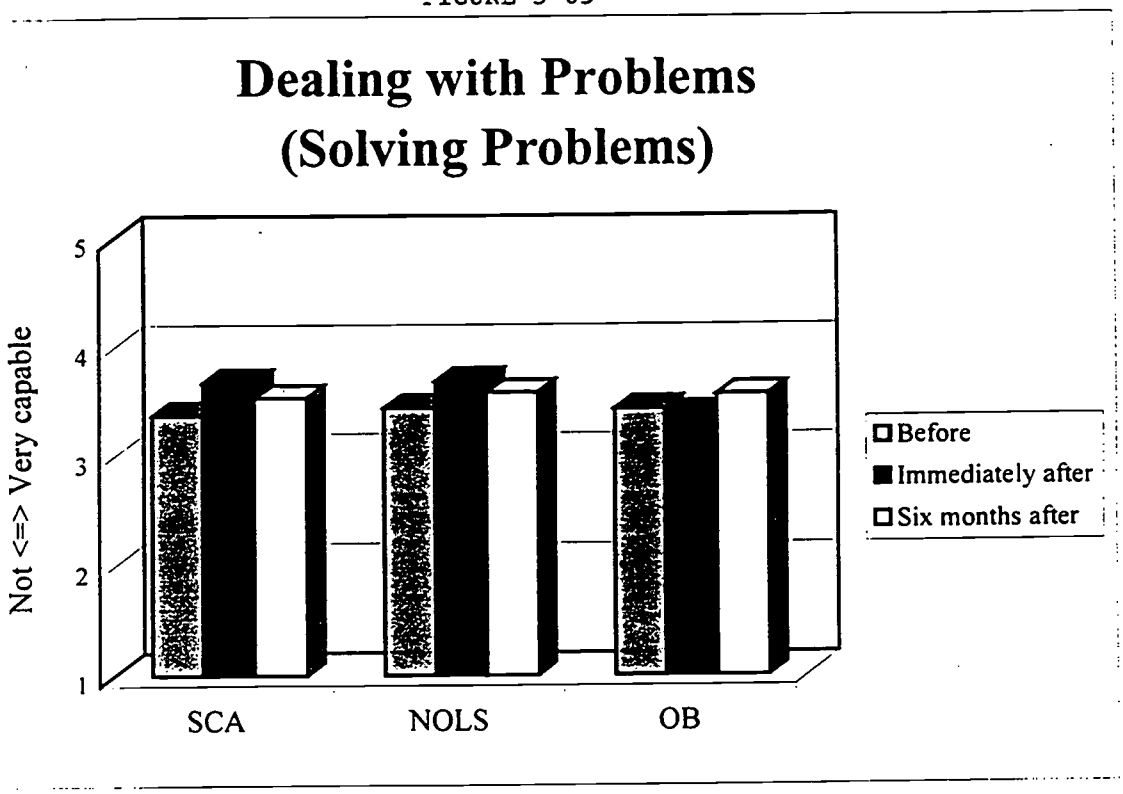

Dealing with Problems
(Evaluating Consequences)
Not <=> Very capable
5
4
3
2
1
SCA
NOLS
OB
Before
Immediately after
Six months after

FIGURE 3-65


Dealing with Problems
(Solving Problems)
Not <=> Very capable
5
4
3
2
1
SCA
NOLS
OB
Before
Immediately after
Six months after

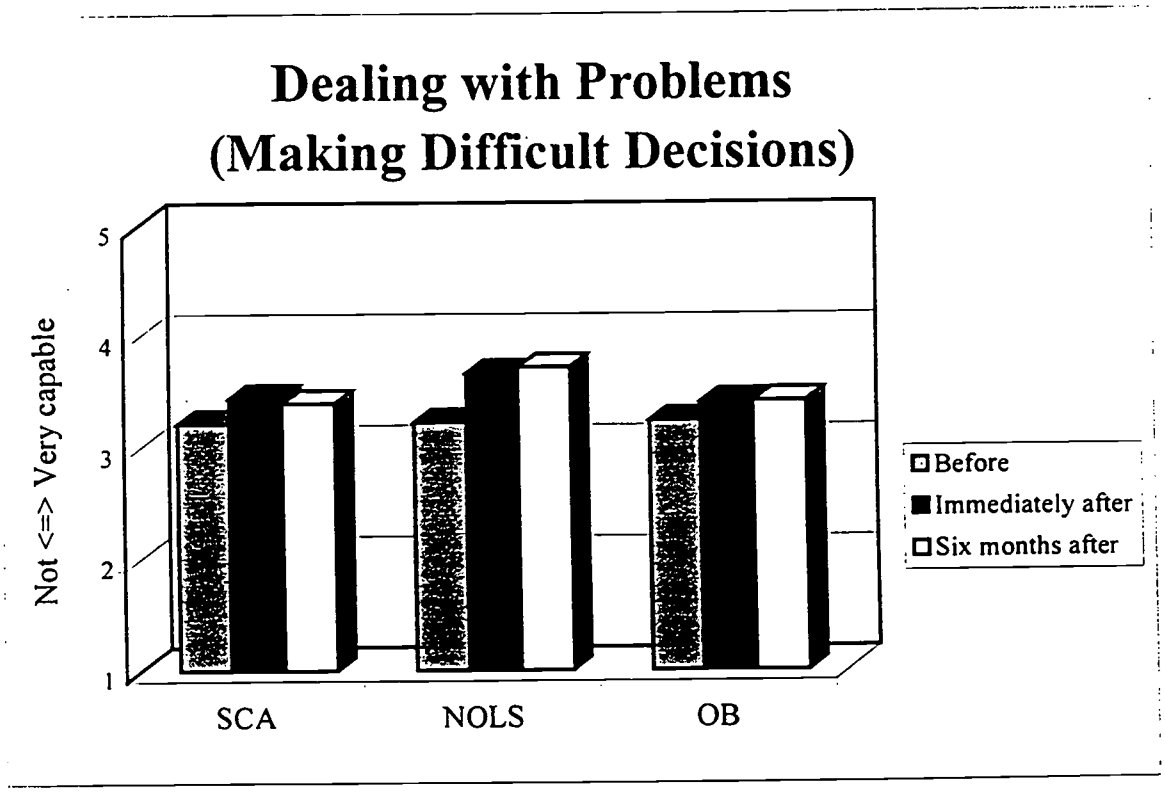
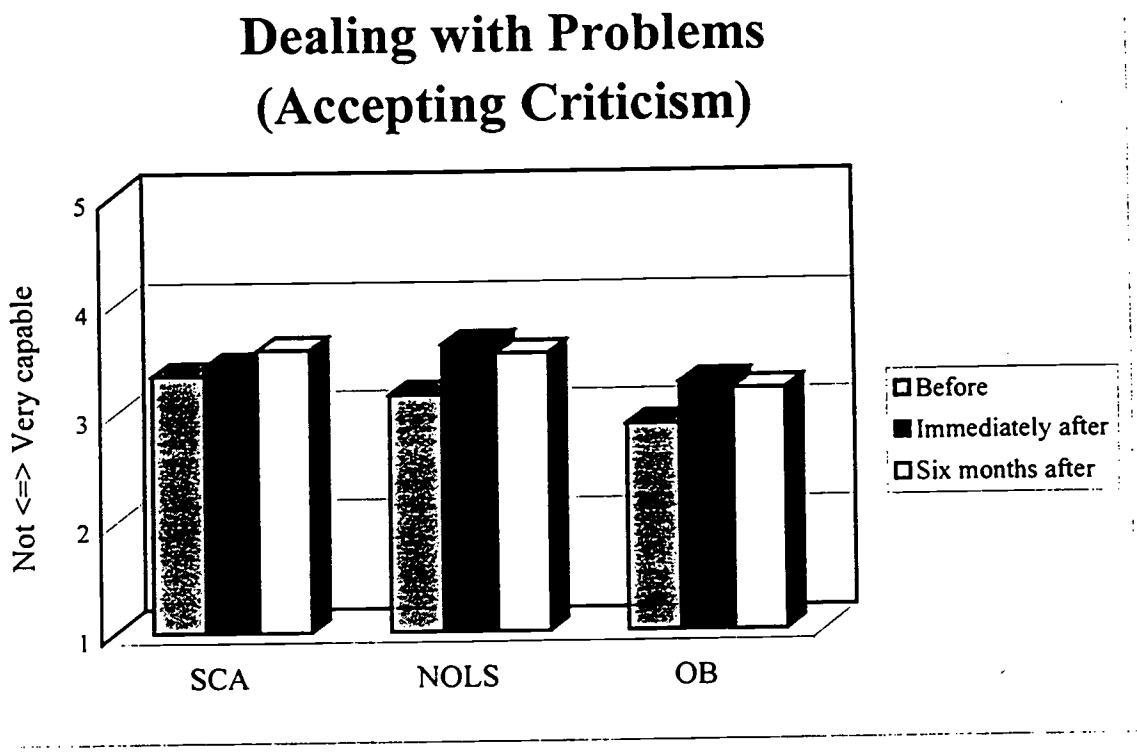

Dealing with Problems
(Making Difficult Decisions)
Not <=> Very capable
5
4
3
2
1
SCA
NOLS
OB
Before
Immediately after
Six months after

FIGURE 3-66


Dealing with Problems
(Accepting Criticism)
Not <=> Very capable
5
4
3
2
1
SCA
NOLS
OB
Before
Immediately after
Six months after

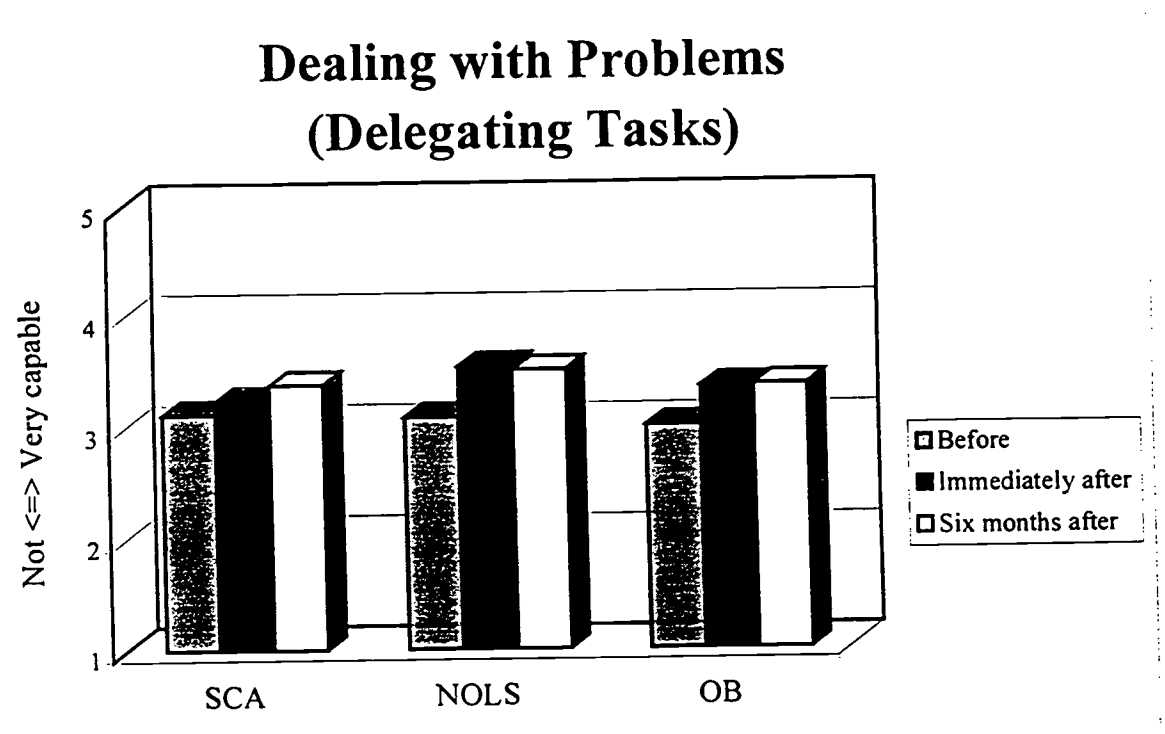
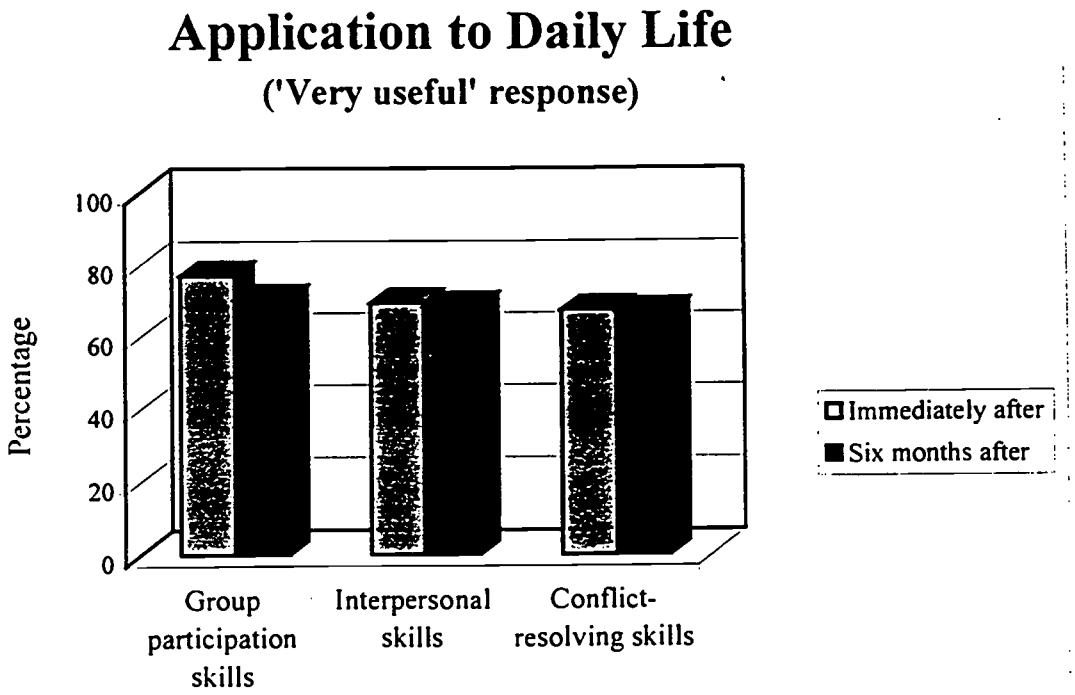

Dealing with Problems
(Delegating Tasks)
Not <=> Very capable
5
4
3
2
1
SCA
NOLS
OB
Before
Immediately after
Six months after

FIGURE 3-67


Application to Daily Life
('Very useful' response)
Percentage
100
80
60
40
20
0
Group participation skills
Interpersonal skills
Conflict-resolving skills
Immediately after
Six months after

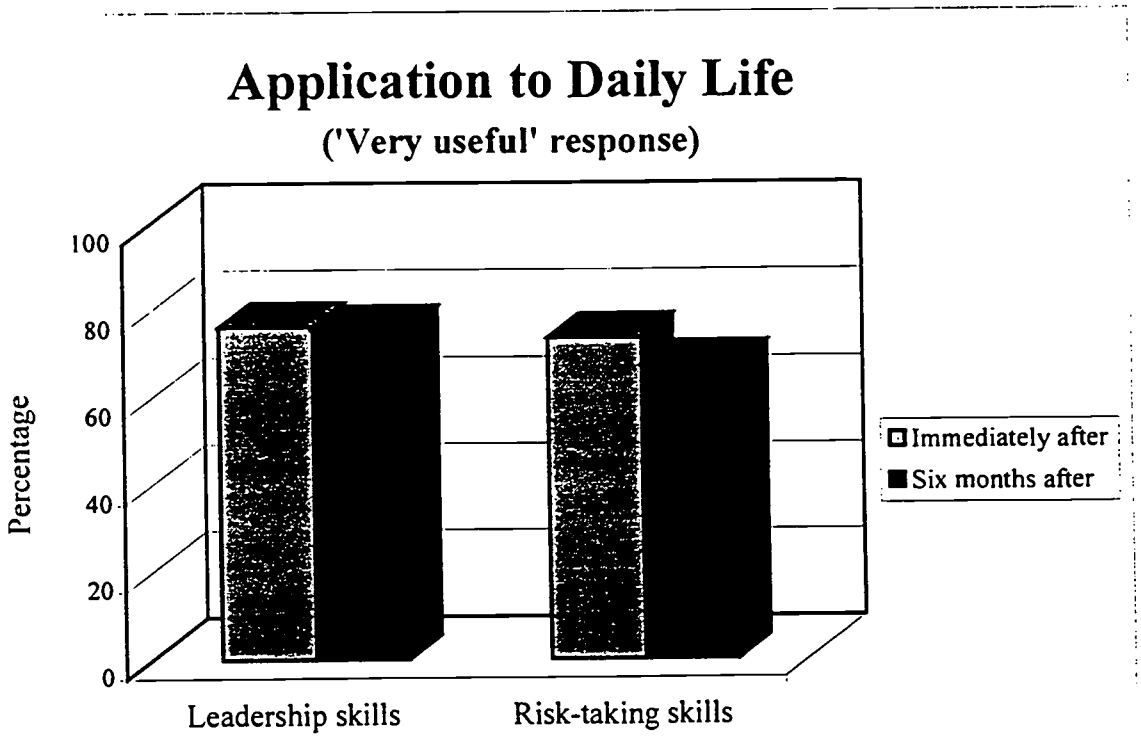

Application to Daily Life
('Very useful' response)
Percentage
100
80
60
40
20
0
Leadership skills
Risk-taking skills
Immediately after
Six months after

FIGURE 3-68

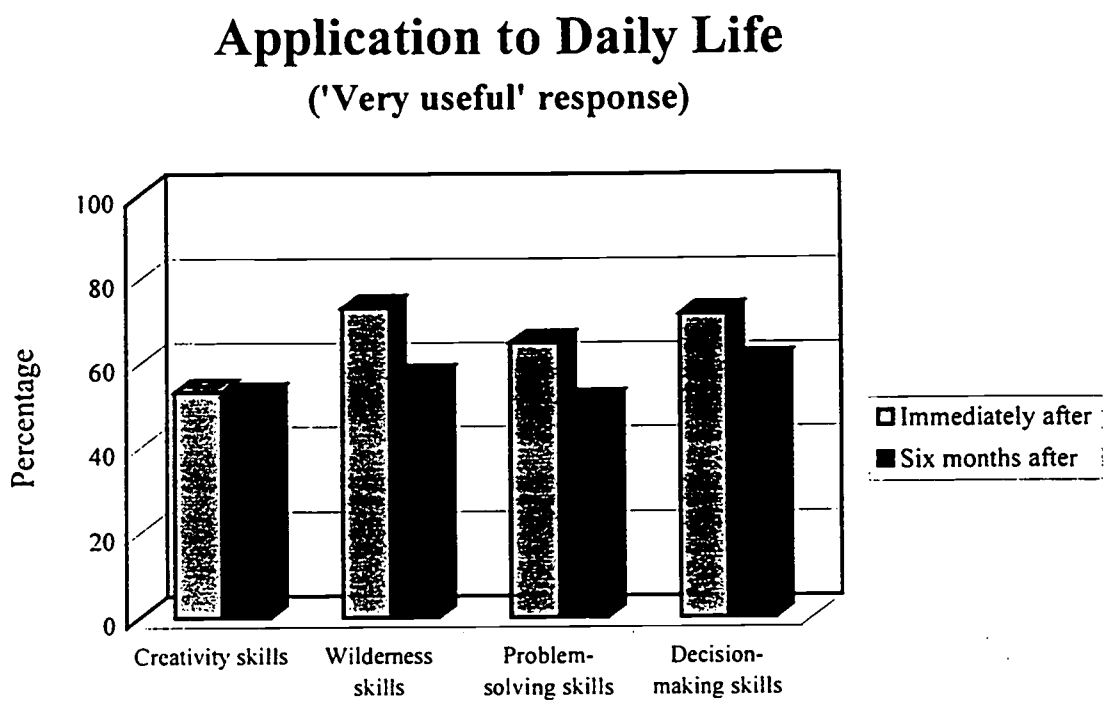
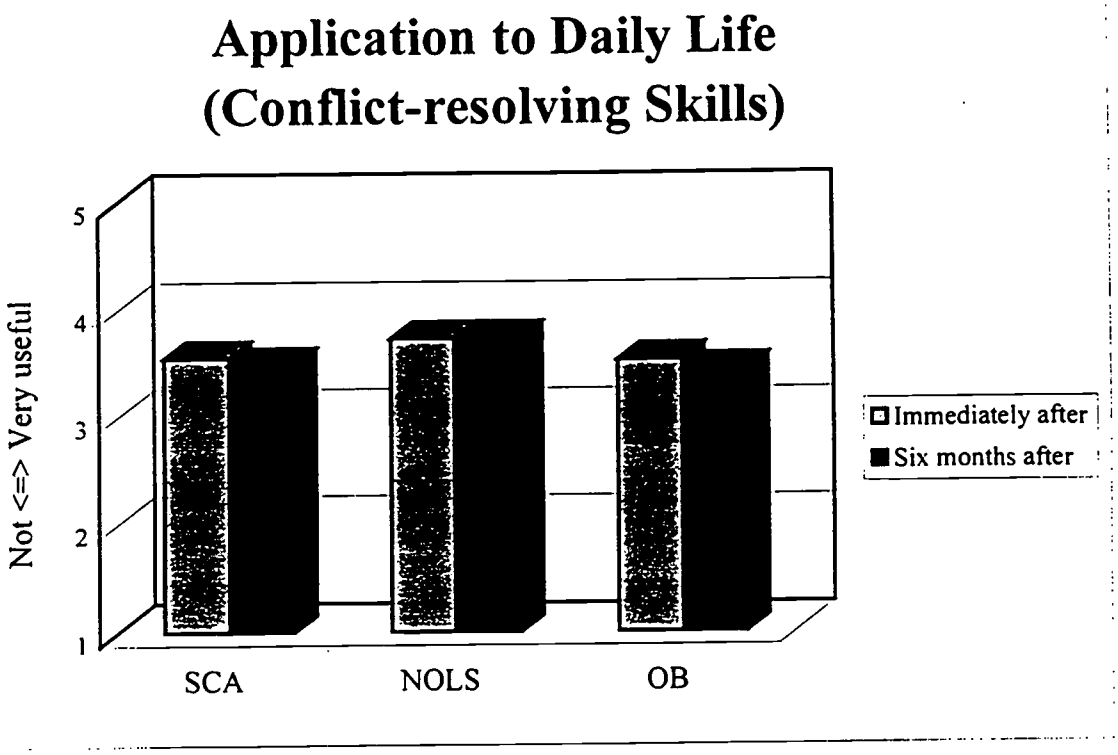

Application to Daily Life
('Very useful' response)
Percentage
100
80
60
40
20
0
Creativity skills
Wilderness skills
Problem-solving skills
Decision-making skills
Immediately after
Six months after

FIGURE 3-69


Application to Daily Life
(Conflict-resolving Skills)
Not <=> Very useful
5
4
3
2
1
SCA
NOLS
OB
Immediately after
Six months after

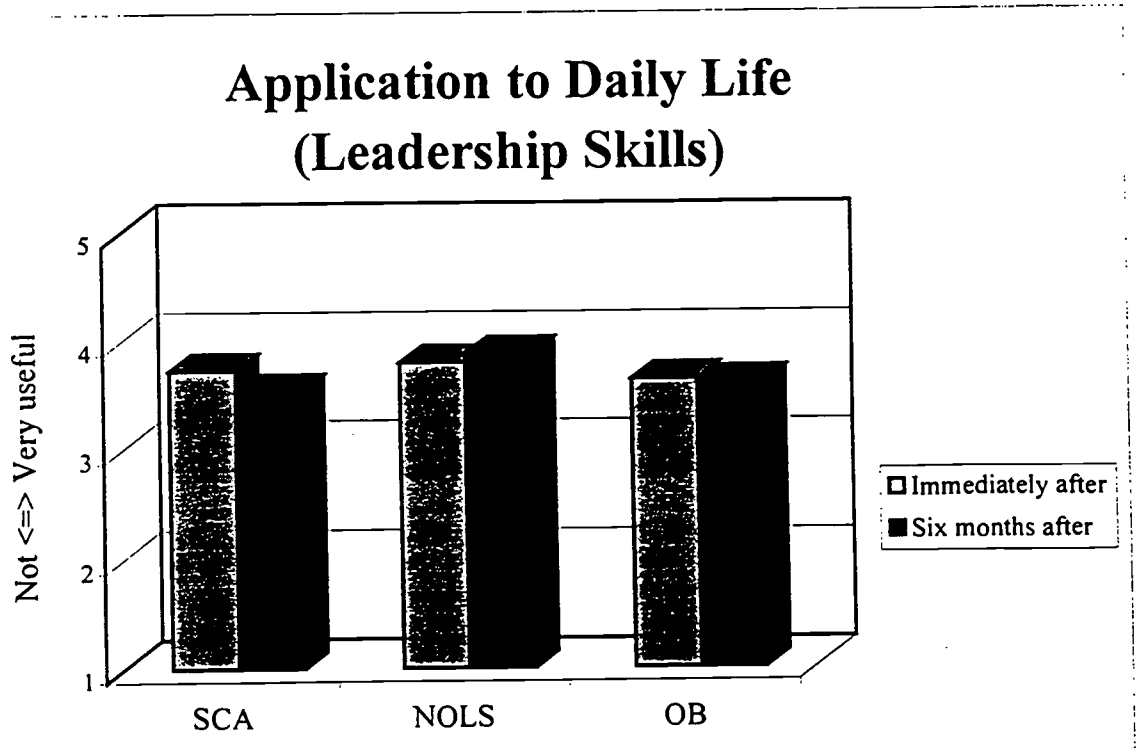
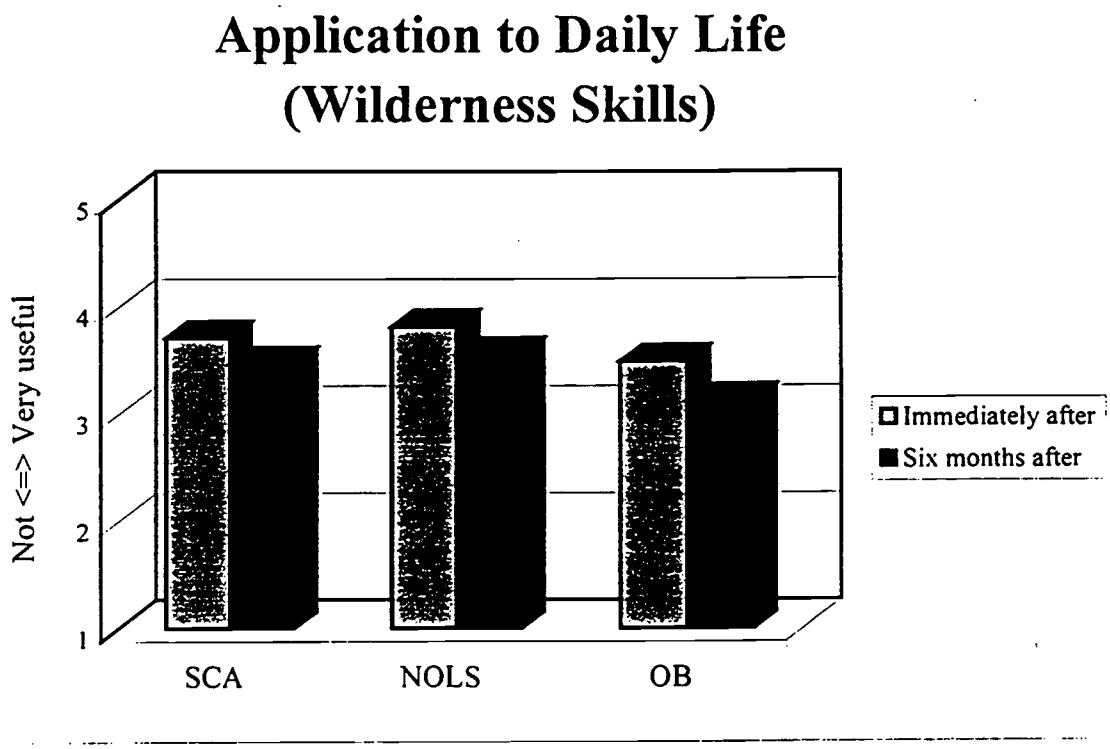

Application to Daily Life
(Leadership Skills)
Not <=> Very useful
5
4
3
2
1
SCA
NOLS
OB
Immediately after
Six months after

FIGURE 3-70


Application to Daily Life
(Wilderness Skills)
Not <=> Very useful
5
4
3
2
1
SCA
NOLS
OB
Immediately after
Six months after

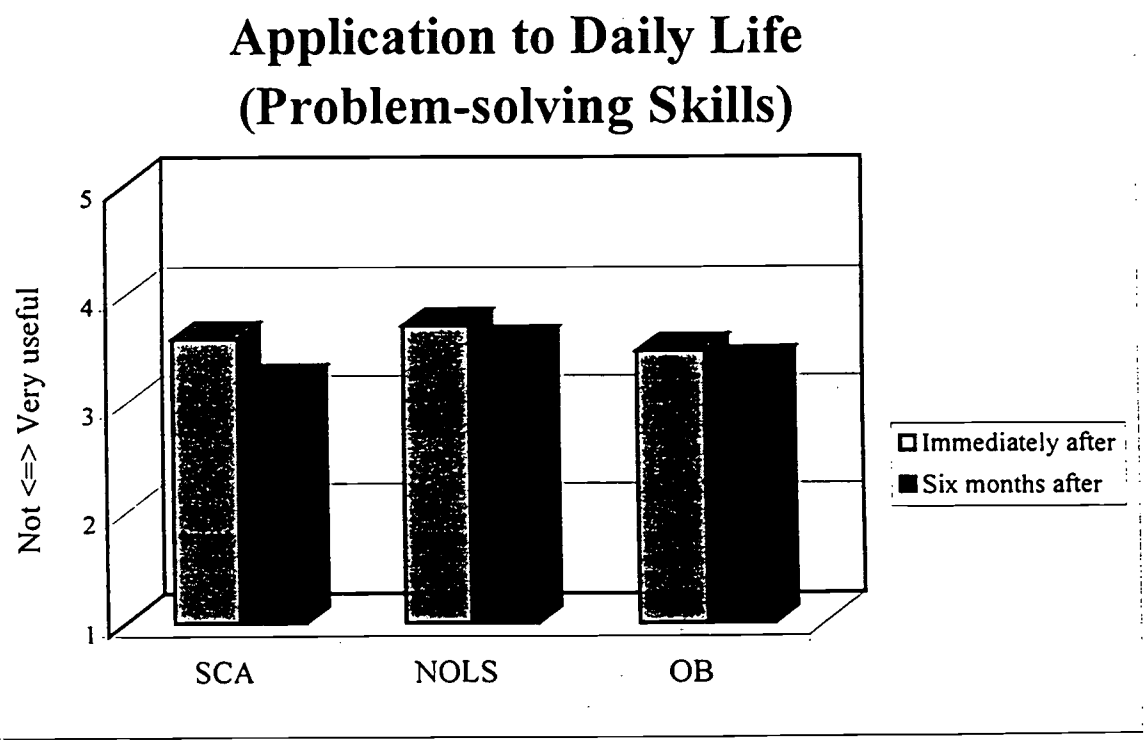

Application to Daily Life
(Problem-solving Skills)
Not <=> Very useful
5
4
3
2
1
SCA
NOLS
OB
Immediately after
Six months after

FIGURE 3-71

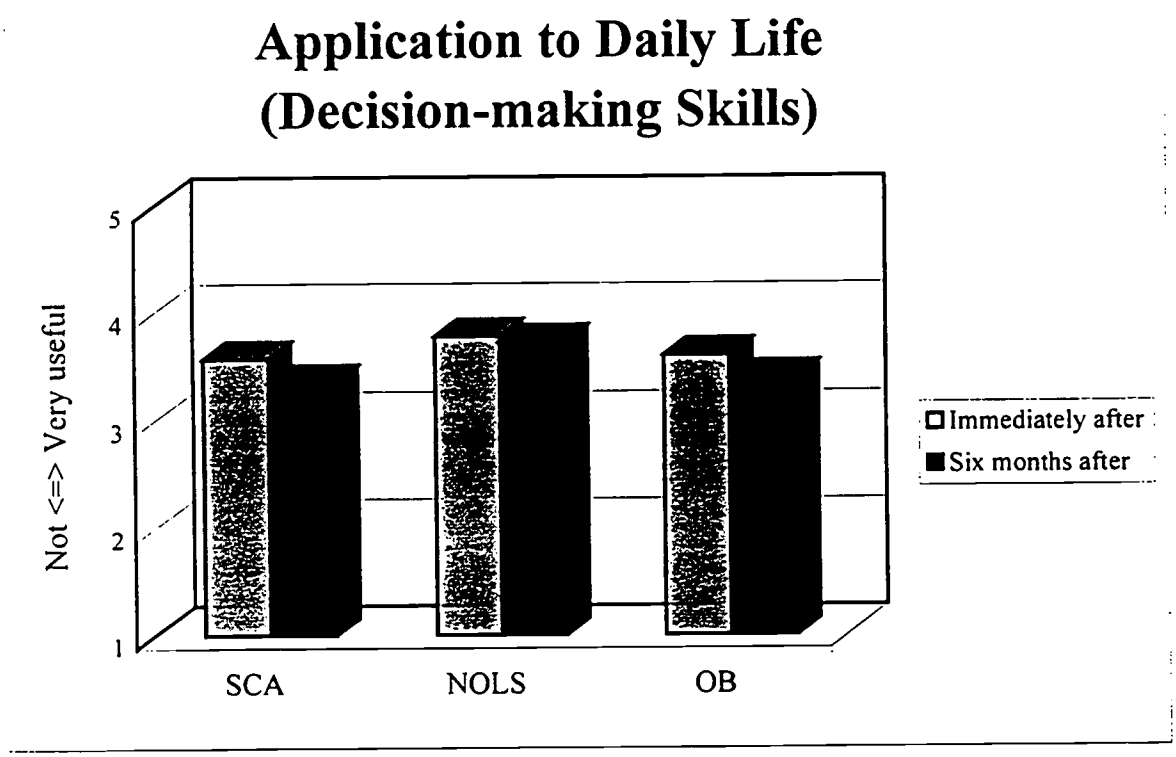
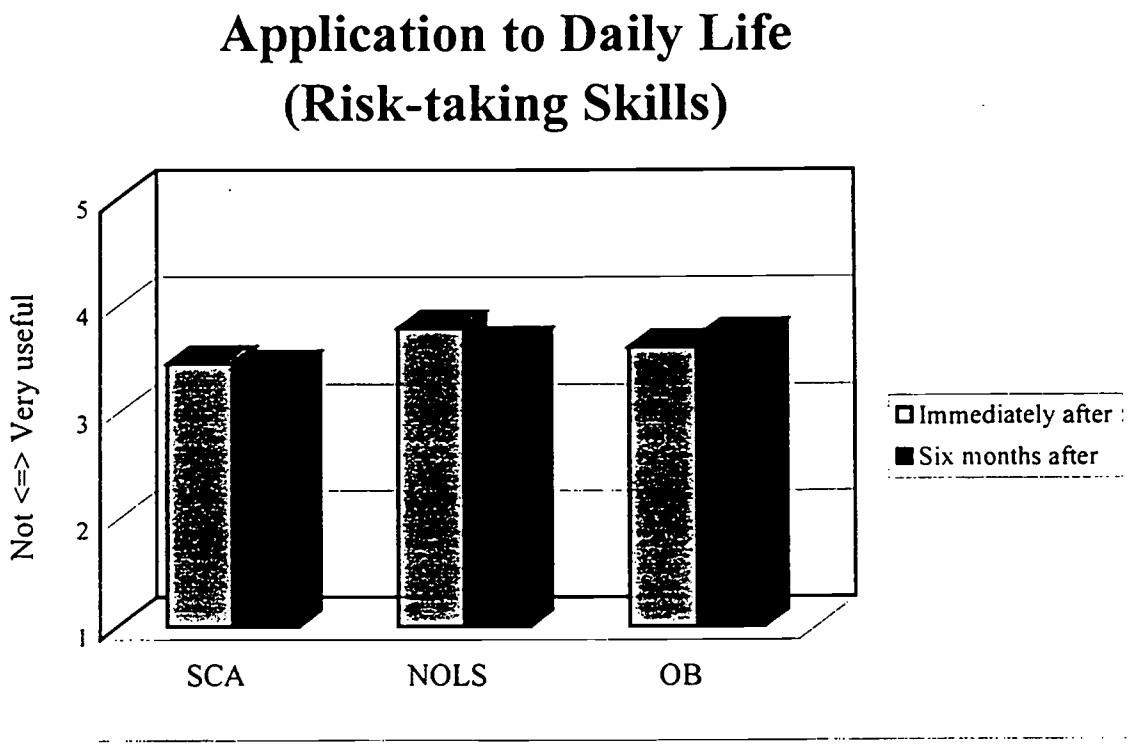

Application to Daily Life
(Decision-making Skills)
Not <=> Very useful
5
4
3
2
1
SCA
NOLS
OB
Immediately after
Six months after

FIGURE 3-72


Application to Daily Life
(Risk-taking Skills)
Not <=> Very useful
5
4
3
2
1
SCA
NOLS
OB
Immediately after
Six months after

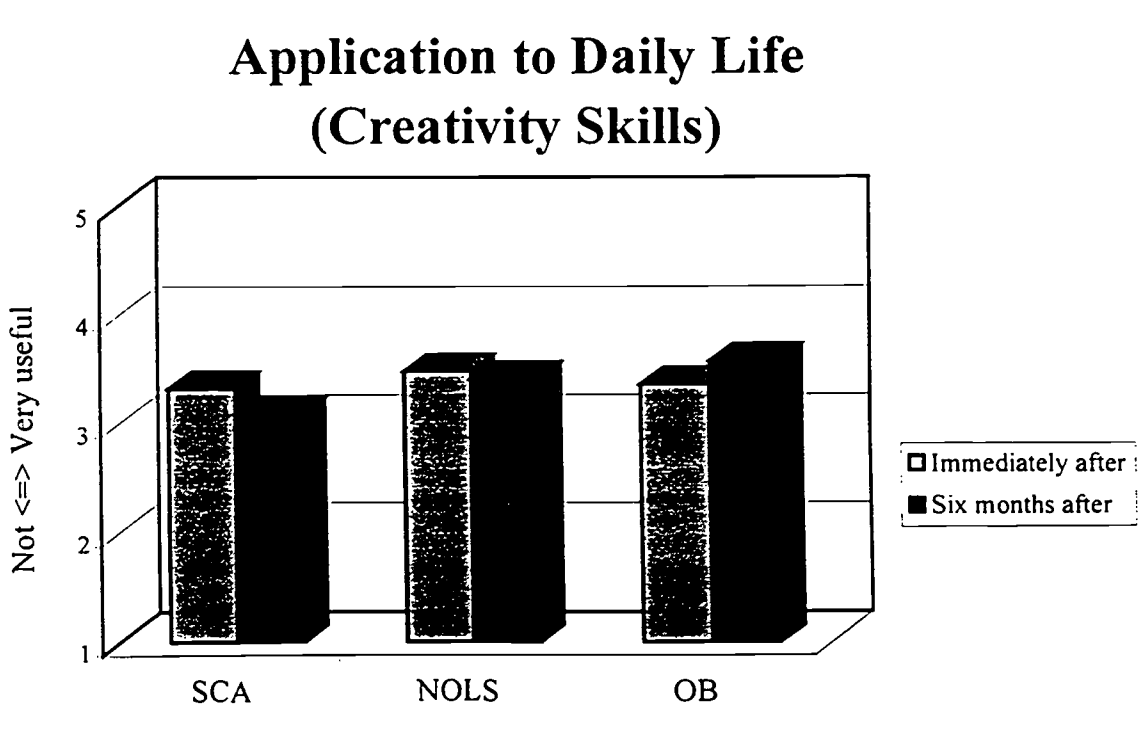
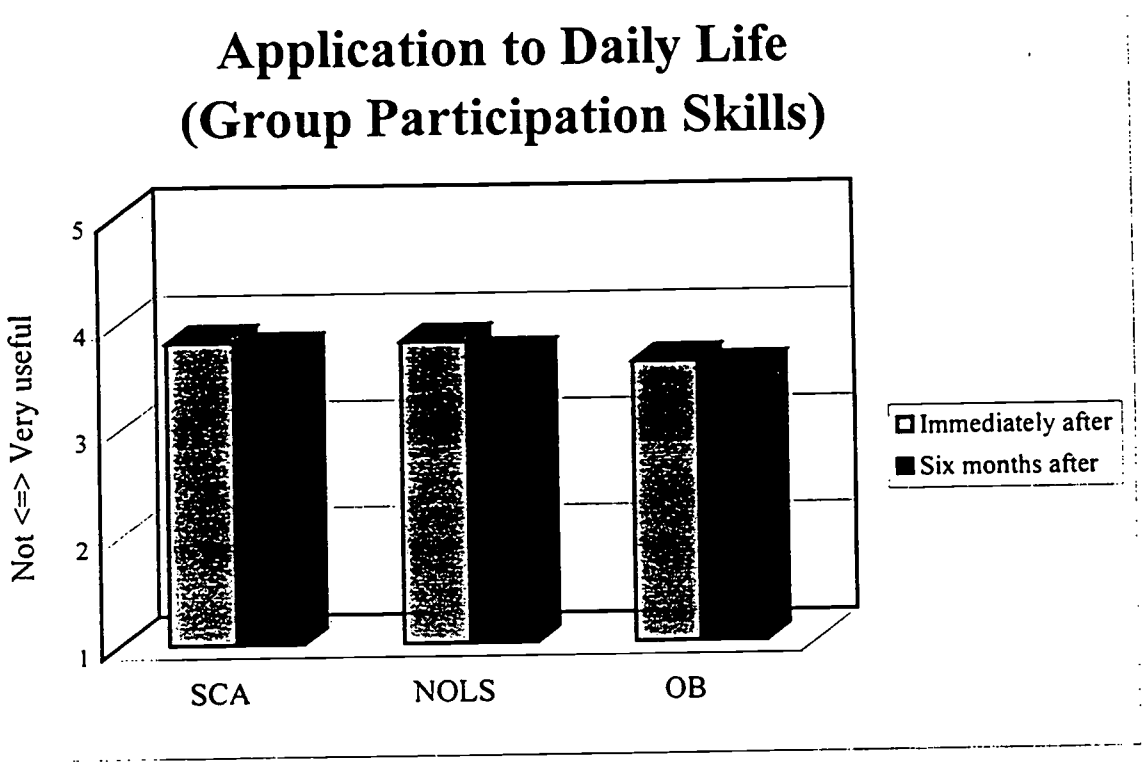
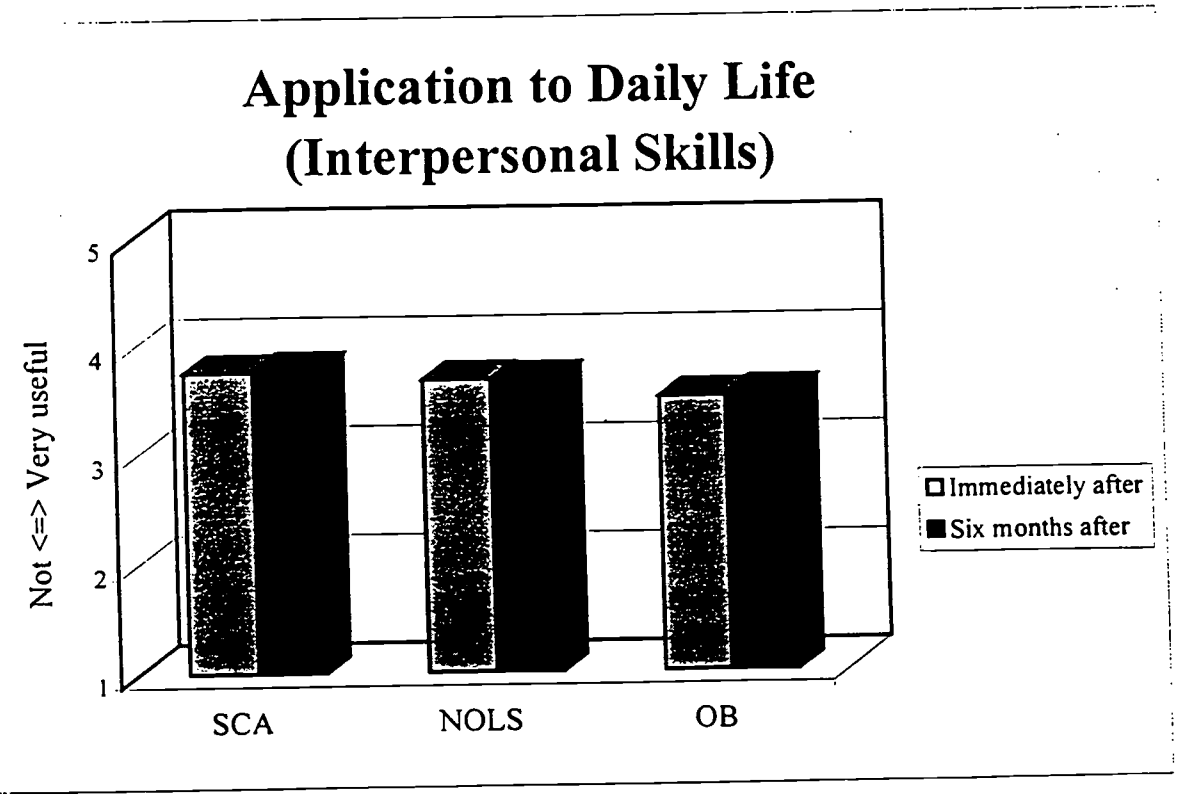

Application to Daily Life
(Creativity Skills)
Not <=> Very useful
5
4
3
2
1
SCA
NOLS
OB
Immediately after
Six months after

FIGURE 3-73


Application to Daily Life
(Group Participation Skills)
Not <=> Very useful
5
4
3
2
1
SCA
NOLS
OB
Immediately after
Six months after


Application to Daily Life
(Interpersonal Skills)
Not <=> Very useful
5
4
3
2
1
SCA
NOLS
OB
Immediately after
Six months after

CHAPTER 4

CONCLUSIONS AND RECOMMENDATIONS

The primary objective of this research was to improve our understanding of the learning and character development affects of the outdoor wilderness experience. We chose to concentrate our inquiry on three widely known, highly regarded national organizations, each in existence for more than a quarter of century – the Student Conservation Association, the National Outdoor Leadership School, and Outward Bound.

Prior research efforts had generated relevant data on the effects of OB and NOLS programs, although little systematic research had been conducted of SCA activities. Moreover, much of this research had been constrained by relatively small sample sizes and a regional emphasis, a stress on limited aspects of the outdoor experience, and an often reliance more on qualitative than quantitative data. We intended this study to be national in scale, covering a broad range of program impacts, and employing a diversity of methodological approaches, although mainly a quantitative orientation. We hoped to meet the research challenge posed by Backman and Crompton when they remarked (1985:11): "There is a paucity of empirical research...[and] much of the research...falls short of the scientific standards necessary...to make a meaningful contribution." As one respondent remarked: "Great idea! Wonder why it took so long...to do this research? I hope you can use your results to promote some basic reforms of our educational system, especially for children.".

The current investigation certainly does not provide the final answer to the many important questions regarding the effects of the outdoor especially wilderness experience. Moreover, what we accomplished in breadth at times came at the expense of more in-depth, detailed, and precise understanding of the impacts of outdoor programs. Still, we believe the unusual scale of our effort offers a more comprehensive and systematic assessment of the topic than has occurred before.

The results of this research and other empirical inquiry lead us to conclude that prolonged and challenging immersion in the outdoors, especially in relatively pristine settings, can exert a powerful physical, emotional, intellectual, and moral-spiritual influence on young people. We believe exposure to healthy and diverse natural environments has always been an essential component in human evolution and development, as we will explain in more detail later in the chapter. The results of this and other studies suggests the outdoor experience continues, even in our highly technological and urban society, to be a critical pathway for youth to achieve physical and mental fitness and security. Yet, our formal educational systems and curricula have never been more dominated by an emphasis on abstract, specialized, indoor, and largely non-experiential learning.

We focused on exploring two major impacts of the outdoor experience: first, effects on knowledge, attitudes, and behaviors toward the natural environment; and, second, impacts on physical and mental development. More specifically, a review of the research literature led us to emphasize the following major impacts:

- Environmental knowledge and awareness
- Environmental attitudes and values

- Outdoor recreational interests and skills
- Career choice and interest in community service
- Self-esteem and self-concept
- Interpersonal relations
- Critical thinking and problem solving
- Physical fitness and well-being
- Academic interests and performance.

We conducted two complementary studies – a retrospective and a longitudinal investigation – to explore these impacts, each study design possessing particular strengths and weaknesses. We believed a more comprehensive and convincing picture of the effects of the outdoor experience could be obtained by taking the unusual and relatively difficult step of conducting both kinds of research.

The retrospective investigation explored the views of a random sample of individuals who at some point in their life had participated in one of the three organizations programs. We contacted individuals by mail, using lists provided by SCA, NOLS, and the North Carolina OB School. Nearly 500 persons completed a 30-45 minute survey regarding the effects of the program experience, and its impact over a period of time ranging from one year in the past to, in some cases, more than twenty years ago. Advantages of the retrospective study approach included considering the views of a relatively large number of past participants, and exploring how they regarded the experience sometimes many years after it had occurred. Two important methodological limitations were, one, a tendency among respondents to view the past distorted by the perspectives of the present and the intervening years and, two, a large

number of contacted persons who did not return completed surveys. As previously indicated, only approximately 30% of past participants who were contacted and eligible to participate completed and returned the mail survey. This limited response rate caused some concern regarding the validity of the results of the retrospective study, particularly the possibility that persons who felt more positively about the experience may have been more likely to participate.

The longitudinal investigation was intended to address some of these methodological problems. In this research, we collected data from persons just before, immediately following, and six months after they had participated in one of the three organizations programs. By directly contacting participants at the time of the experience, we were able to obtain almost unanimous cooperation in completing surveys before and immediately following the programs, as well as in-depth interviews with some participants. The response rate to our mail survey conducted six months later was approximately fifty percent. Longitudinal study data was presumably of higher quality than obtained in the retrospective study, as it was relatively unaffected by the possible distortion of recall and collected at three points in time, including immediately before and after the experience. Methodological disadvantages of the longitudinal research included not being able to ascertain participants' views long after the experience, and the smaller and less diverse sample. The relative strengths and weaknesses of the retrospective and longitudinal studies underscore the overall advantage of our choosing to conduct both types of research.

Results Summary

We do not want to repeat the results already presented in the previous two chapters, but it might be helpful to highlight some of the major findings among participants as a whole, the effect of time since participation on the perceived impact of the programs, and differences among the organizations. Perhaps the single most impressive result of both studies was the reported degree of overall impact of immersion in relatively pristine natural settings. The majority of respondents regarded their experience as one of the best in their life, and as having exerted major impacts on their personal and intellectual development as well as outdoor recreational and environmental interests. A smaller, but substantial minority, viewed the experience as significantly affecting their career interest and inclination to contribute community service.

As indicated, this degree of overall impact occurred in both the retrospective and longitudinal studies. Thus, no discernible difference occurred in the extent of positive perception of the experience among a minority of past participants versus all participants immediately following their programs. Moreover, this highly positive outlook did not appear to diminish over time. In the retrospective study, people who participated six and more years ago were just as if not more likely than recent participants to view their experience as highly worthwhile, as one of the best in their life, and as having exerted considerable influence on their environmental interests and personal development. In the longitudinal investigation, most participants viewed the experience as exerting great if not greater impact six months after the program.

Both studies revealed substantial effects on participants' outdoor recreational activities, particularly hiking, camping, backpacking, water sports, adventure travel,

wildlife observation, and others. Very pronounced and persistent changes also occurred in attitudes toward nature. Most respondents reported far greater respect, affinity, appreciation, and sense of humility and spiritual connection with the natural world as a consequence of their outdoor experience. Most professed a stronger commitment to conservation and stewardship of the environment, a desire to learn about nature, and interest in supporting environmental causes and organizations. Still, the actual degree of change in conservation behavior was limited, particularly diminishing over time since program participation. Moreover, we observed only limited increases in factual environmental knowledge and understanding, although substantial improvement in various outdoor skills and interest in biology and natural history.

Impacts on personal and character development were especially impressive in both the retrospective and longitudinal studies. Very pronounced impacts were reported by most participants in various aspects of physical, emotional, and intellectual development and well being. Challenge and immersion in pristine nature in the shared company of others generally produced major and sometimes profound changes in self-concept and enhanced capacity for coping and adapting. This experience particularly resulted in increased self-confidence, self-esteem, independence, autonomy, and initiative. Substantial, although less striking, changes were observed in many elements of interpersonal relationship. Only limited improvements were noted, however, in several aspects of dealing with others, particularly strangers, including compassion, tolerance, and views of other racial and ethnic groups. Finally, declining impacts often occurred over time in many aspects of personal and character development in both the retrospective and longitudinal studies.

Some consistent organizational differences were observed, despite the impressive findings for participants as a whole. Student Conservation Association and National Outdoor Leadership School respondents generally reported the most pronounced changes in environmental attitude, concern, and personal development. SCA participants revealed the greatest impacts on environmental knowledge and behavior, particularly conservation activity, service, and career interest. NOLS participants usually reported the most striking effects on personal and character development, as well as interest in various outdoor recreational activities and skills. These impacts were generally less pronounced among OB participants, although still substantial. OB respondents reported the greatest impacts on several aspects of coping behavior.

These organizational differences frequently reflected varying program emphases and philosophies. SCA historically has placed greatest stress on conservation, environmental career development, and public service activities. NOLS has tended to place greater emphasis on leadership and personality development, as well as interpersonal skills and minimum impact camping. OB pioneered the outdoor challenge field, particularly the role of coping with adversity in character development. Despite these variations, one notes more similarities than differences among the three organizations, and a striking correspondence in reported organizational findings in both the retrospective and longitudinal studies.

In concluding this brief summary of the major results of the two studies, we turn once again to the illustrative and often vivid reflections of participants regarding the importance of their outdoor experience, sometimes many years after the programs had occurred.

The experience, while isolated and out of the realm of everyday life, is applicable to everything that I do. Because everything in the wilderness was such raw emotion and the outer events so simple, the personal challenges faced and overcome were within myself. Much of what I faced...had to do with my own fears and weaknesses. Overcoming them changed me as a person. When I face a more "complex" problem in the outside world, I need only to go back to [the experience] to see what solution I came to when it was just me against myself surrounded by simplicity and the answer becomes clearer. [The program] allowed me to experience a connection with nature and simplicity and balance within that will be with me for the rest of my life.

It brought to light the limitless of my potential and taught me to surrender to peacefulness. I have a passion for the wild now that will be with me through the rest of my life.

Participating [occurred at] a pivotal point in my life. It gave me the opportunity to take a risk. It strengthened my sense of self. It gave me a feeling of purposefulness, self-respect, and strength that I had never had before. When you have confidence in yourself it affects every aspect of your life.

[It] was the most amazing, awe inspiring, thought provoking, and challenging experience of my life.

Causal Relationships

The programs certainly had limitations and, in the next section, we will consider some shortfalls and possible ways these might be addressed. Still, the results of both studies constitute a striking and largely unequivocal indication of the largely positive impact of the extended outdoor experience, particularly among late adolescents and young adults. Program effects on many aspects of environmental perception, outdoor interest and activity, and character and personality development often bordered on the remarkable and profound. This conclusion is provocative, potentially important, debatable, but certainly worth explaining.

Assuming for the moment the validity of the overall results, we can ask why an activity largely occurring in the wild, so unlike the daily experiences faced by these young people in modern society, should exercise such pronounced and often long-term impacts on their interests, personalities, and goals? This issue requires more careful consideration than can be afforded here, but we can offer some brief explanation for why the outdoor, particularly wilderness, experience may exert so powerful an impact.

Earlier in the chapter, we noted the hypothesis that people possess an inherent inclination to affiliate with natural process and diversity, and this affinity continues today to be instrumental in human physical and mental development, especially among young people (Kellert 1997, Wilson 1984, Kellert and Wilson 1993). This concept, sometimes referred to as the "biophilia" hypothesis, has been associated with nine values of nature whose satisfactory expression has been linked to various aspects of physical, emotional, and intellectual growth and development. One-sentence definitions of the nine values are

provided in Table One. Immersion and challenge in the outdoors can potentially foster these values. We will briefly describe these values and how each might be fostered through outdoor wilderness experience. This presentation will occur in alphabetic rather than presumed order of importance, and one of the value types (the symbolic) will be omitted from the description at this time.

An **aesthetic** value emphasizes the physical attraction and appeal of nature. Few experiences in life exert as powerful and consistent an impact on people as the beauty and attractiveness of elements of the natural world. This inclination exists because it reflects various adaptive benefits. For example, a heightened awareness of nature's physical features and appeal can engender an awareness of harmony, balance, and grace. People discern unity and order in certain natural features, and these aesthetic impressions inspire and instruct. In addition, the aesthetic appeal of nature can engender an enhanced inquisitiveness and curiosity. Particularly attractive natural objects and settings can be captivating, encouraging wonder and curiosity that, in turn, enriches the human capacities for exploration, creativity, and discovery.

These benefits from a heightened aesthetic appreciation of nature are especially pronounced in pristine natural settings such as those characteristic of NOLS, SCA, and OB programs. Many participants remarked on the spectacular and awe-inspiring beauty of the areas they experienced. The physical appeal of the outdoors often remained poignant in their memories long after the programs had occurred, and was frequently cited as an antidote to the pressures and relative unattractiveness of the modern world.

A Typology of Values of Nature

Aesthetic	Physical attraction and beauty of nature
Dominionistic	Mastery and control of nature
Humanistic	Affection and emotional attachment to nature
Moralistic	Spiritual and ethical importance of nature
Naturalistic	Immersion and direct involvement in nature
Negativistic	Fear and aversion of nature
Scientific	Knowledge and understanding of nature
Symbolic	Metaphorical and figurative significance of nature
Utilitarian	Material and practical importance of nature

A **dominionistic** value emphasizes physical and mental skills derived from coping and mastering adversity in nature. Wilderness almost by definition involves confronting challenge, hardship, and uncertainty. Exercising adaptability and ingenuity in persevering in this setting can be an especially rewarding aspect of the wilderness experience. Self-confidence and self-esteem often results from demonstrating the capacity to function under difficult and trying circumstances, as well as resolve adverse and unexpected situations. By overcoming hardship and coping with the unfamiliar, young people can emerge surer of themselves. By successfully confronting and resolving adversity, they can become more inclined to take risks and challenge the unknown.

The potential for building physical and mental character through challenge in the outdoors was a major element in Outward Bound's creation and the development of this field more generally. Few settings provide more and better opportunities than wilderness for testing and challenging oneself. In an age when young people face increasing reminders of their dependence on complex systems and less control over their lives, the chance for demonstrating adaptive capacity and mastery in challenging settings can be a valued means for enhancing self-confidence and self-esteem.

The **humanistic** value focuses on the emotional appeal of the natural world. Nature can represent a subject of deep affection, fondness, and attachment for people. These sentiments can foster feelings of relationship and connection, providing a means

for expressing and developing capacities for intimacy, trust, and kinship. By contrast, isolation, separation, and aloneness represent heavy burdens for most people. With rare exceptions, people crave affection, relationship, and connection in their lives, and these qualities can be nurtured through emotional ties with nature.

Cultivating an emotional relation to nature, especially in the company of others, can also promote cooperation and sociability. People covet relationships and gratefully receive and extend affection and allegiance. These emotional ties become especially pronounced when facing challenge and adversity together. The shared wilderness experience can foster mutual ties as well as bonding with nature. In the programs examined, the friendship, affection, and allegiance expressed by participants toward one another and the natural environment were often among the most pronounced sentiments encountered. Previously total strangers developed extraordinary feelings of affection and loyalty for one another and the natural world in a relatively short period of time, and this bonding often remained strong long after the experience.

A **moralistic** value emphasizes the spiritual and ethical importance of nature. People can achieve heightened feelings of meaning and purpose through enhanced connection with nature. Discerning basic and universal patterns in the natural world can sometimes offer a spiritual foundation that gives definition and shape to people's lives. The conviction of an underlying order and harmony in nature can foster the belief that at the core of human existence resides a fundamental logic, harmony, and goodness. People derive faith and confidence in perceiving a unity that transcends their individual aloneness and separation. Moreover, the inclination to respect and care for nature can

result from a sense of relation between human wholeness and the health and integrity of the natural world.

These sentiments of spirituality and humility toward nature prominently occurred among many program participants in both the longitudinal and retrospective studies. The wilderness experience was frequently cited as a powerful source of moral and spiritual inspiration, meaning, and significance. Many participants indicated increased faith and ethical commitment to protecting the environment stemming from their encounters with relatively unspoiled nature.

A **naturalistic** value emphasizes immersion and direct experience in the many details and rhythms of natural systems. People can enhance their capacities for curiosity, imagination, and discovery through personal contact and exploration of nature's rich tapestry of shapes and forms, above all its more conspicuous plants, animals, and landscapes. In doing so, they foster physical fitness and mental acuity, and expanded inclinations for adventure and wonder. Immersion in nature can further enhance the capacities for reacting quickly, resolving new and difficult situations, and consuming with efficiency. This involvement in natural systems often engenders a sense of authenticity, clearer priorities, and increased purpose and resolve.

The wilderness experience particularly encouraged a naturalistic perception of nature, perhaps to a greater degree than any other value. A nearly inevitable result of challenge in pristine environments was deep immersion in natural process and diversity. The physical and mental benefits of this involvement in nature were often strongly expressed in both the retrospective and longitudinal studies.

A **negativistic** value emphasizes fears and anxieties toward nature. A frequent, even essential, element of the wilderness experience is risk, danger, and uncertainty associated with challenging landscapes and species. Dread and anxiety can sometimes provoke highly aversive, even crippling and destructive reactions. More typically, the inclination to respond negatively to certain creatures and natural settings reflects a realistic attempt to avoid harm, injury, and even death in nature. Human physical and mental capacity has always depended on skills and emotions associated with a healthy distancing from potentially injurious elements in nature. Lacking this awareness and appreciation, people often behave naively and presumptuously, ignoring the dangers posed by many natural systems and processes.

Moreover, these fears and anxieties can foster more positive sentiments of awe, humility, and respect for nature. The notion of awe encompasses elements of fear as well as reverence and wonder. Nature stripped of its power often becomes an object of mere entertainment and condescension. Species and habitats utterly subdued rarely provoke admiration and respect.

Most of the participants experienced fear and anxiety toward nature at some point in their programs. Most asserted nonetheless how much they benefited from learning to cope with these fears and apprehensions. Moreover, many acknowledged how much their respect and admiration for nature depended on coming to better appreciate the power and danger posed by particular natural systems and species.

A **scientific** value of nature stresses its role in human intellectual development. People possess a need to know and understand their world with authority. Study and observation of natural process and diversity has always nurtured this inclination and, in

the process, encouraged cognitive growth and capacity. Nature offers a nearly limitless stage for sharpening critical thinking skills and analytical abilities. Observing, examining, and understanding even a fraction of the natural world can provide countless opportunities for acquiring knowledge and honing evaluative and problem solving skills. These cognitive capacities can be advanced in other contexts, but the natural world provides an especially accessible, stimulating, and challenging context for pursuing intellectual competence, particularly among young and inquiring minds. Exploring nature's mysteries can expand the realization of how much people can learn from the incredible ingenuity of the biological enterprise, and the value of its healthy maintenance and perpetuation.

Learning and studying natural systems offered many of the participants a highly valued opportunity for increasing knowledge, developing cognitive abilities, and honing intellectual skills. Moreover, many commented on how much coping and adapting to the rigors of wilderness provided them with the chance for developing problem solving and critical thinking capacities.

Finally, the **utilitarian** value emphasizes the practical and material importance of nature. People have always relied on natural systems and processes for sustenance and security, including the provision of many basic sources of food, medicine, and other commodities. Moreover, human existence, like all life, depends on the continuance of various ecological functions such as decomposition, pollination, oxygen and water production, and others. Despite this material dependence on wild nature, modern society often promotes the illusion that people can achieve food surpluses, material affluence, and physical health by suppressing and eliminating natural process and diversity.

The outdoor experience can vividly remind young people of their physical and material dependence on the natural world and the many benefits of healthy ecological functioning. Moreover, various skills can be obtained from participating in nature's material exploitation. Wilderness camping can nourish the pleasures and satisfactions derived from extracting a portion of one's basic needs for sustenance and security from the land. Beyond the practical gains, young people harvest physical fitness and an enhanced belief in their ability to persevere with craft and skill. These benefits were often cited by program participants as important consequences of the outdoor experience.

A thorough understanding of the various program impacts reported in this study will require additional study and explanation. Still, the causal processes described here provide some rationale for the finding of pronounced and positive effects of the outdoor experience on the physical and mental development of many participants.

Program Limitations

This chapter has summarized some of the major results of our research, largely emphasizing the impressive effects of the outdoor experience on participants. We then considered some reasons for this degree of impact, drawing on our understanding of nature's role in human physical, emotional, and intellectual development. Despite this positive portrayal, we need to acknowledge and briefly note some limitations in impact revealed in these studies.

A particularly disappointing result was the marginal effects on participants' environmental knowledge and behavior. We observed only limited improvements in

factual knowledge of natural process and diversity, including the ability to identify plants and animals as well as more complex understandings of the biophysical environment (e.g., ecology, geology, hydrology). We rarely observed greater environmental awareness and appreciation being accompanied by deeper understanding of ecological structure and process. We also encountered few major changes in conservation behavior, particularly public and less personal efforts at environmental protection and restoration. Moreover, initial increases in conservation activity and environmental stewardship often diminished considerably over the time since program participation.

SCA participants, however, generally reported stronger and lasting effects on environmental knowledge and conservation interest and activity. SCA programs often provided a more explicit focus on environmental responsibility, care, and service. Still, all the organizations, in our opinion, could be more ambitious and effective in promoting improved environmental knowledge and understanding, as well as conservation interest and commitment, among participants.

We reported largely positive effects on personal and character development. Still, we revealed less pronounced impacts on aspects of interpersonal relationship, particularly compassion, tolerance, and acceptance of minority and ethnic groups. A common benefit of the programs was the increased ability of young people to live, work, and resolve problems together. Still, the organizations need to focus more on relationships among participants of widely different backgrounds.

Another limitation reported by some respondents was a separation or disconnection between what they learned in their largely wilderness experiences and its relevance to everyday life. The programs at times fostered dissatisfaction among the

participants with the modern world, but often provided limited knowledge or skills regarding how to improve these circumstances, or the inclination to recognize more positive elements of the built or natural environments where the participants lived. The programs may sometimes subtly foster an intolerance of modern society, but not offer the tools or perspectives needed to act more positively and responsibly. The organizations may need to work harder at fostering a more appreciative outlook of everyday life, as well as enhance the capacity to connect the lessons of the outdoor experience toward achieving a more satisfying and sustainable society.

Another apparent limitation of the programs was diminishing impacts over time in environmental knowledge and character development. This decline is not surprising. Yet, the highly positive views of the overall experience and its considerable short-term impacts suggests the potential virtue of considering ways to better sustain effects over time. For example, the organizations could devote more extensive and deliberate efforts at providing follow-up or repeat experiences. The large proportion of respondents who expressed very positive recollections of their past experiences suggests a large potential market if future opportunities are provided in practical and accessible ways.

Finally, we need touch briefly on the issue of organizational differences. This study was not intended to focus on the relative strengths and weaknesses of the varying organizations, and the results largely demonstrated highly positive effects among all the programs. Still, some organizational limitations were noted, often related to distinctive histories and objectives, and some recommendations can be offered for possible improvement.

As indicated, SCA participants generally reported the most positive and enduring effects on environmental concern and behavior. On the other hand, SCA participants often revealed less pronounced impacts on interpersonal relationship and various problem-solving skills, and we believe more deliberate and extensive efforts in these areas could improve the SCA experience. The great diversity of SCA programs makes it difficult to generalize to all this organization's participants. CCDP respondents often expressed the most uneven and least substantial impacts. We believe better integrating and connecting CCDP programs with SCA's highly effective HS program could ameliorate this problem.

NOLS participants often reported the most pronounced and lasting impacts on personality and character development. On the other hand, more limited effects were noted in many aspects of environmental knowledge and conservation behavior, especially over time. NOLS could accomplish more in this regard but it will require deliberate and extensive efforts.

The overall effect of OB programs generally lagged behind that found for SCA and NOLS. At times, this more restricted impact appeared to reflect a narrower program emphasis on personal development and less focus on promoting environmental awareness, appreciation, and concern. This restricted impact may relate to OB's historical emphasis on nature as a source of challenge and adversity. A broader and more sympathetic approach to the natural environment might improve the emotional, intellectual, and ethical effects of the OB experience.

We want to repeat again these program variations and recommendations are offered in the context of an overall finding of highly positive impacts of the outdoor

experience regardless of organization involved. The strength of these effects and their potential relevance to prevailing educational norms and curricula are the focus of our concluding remarks.

Broader Implications

As indicated, the learning and character development effects of the outdoor experiences examined in this research were largely impressive and remarkable. A great many respondents reported these relatively brief programs had been among the most satisfying, influential, and worthwhile experiences of their lives. An extraordinary number remarked on how much happier and competent they felt as a consequence of participation. Most expressed the view they had become substantially more confident and capable of coping with everyday life. And, the great majority indicated greater appreciation, awareness, and concern for the natural environment and its conservation because of their participation. These results add support to a growing body of evidence suggesting immersion and challenge in the outdoors, especially wilderness settings, can have meaningful and lasting impacts on especially late adolescents and young adults.

These findings are especially noteworthy at a time of increasing concern about the quality of educational norms and curricula today, especially at the secondary school level. Many have questioned the capacity of our prevailing educational paradigms to motivate and train young people, as well as reveal how to integrate and use their acquired knowledge in practical, relevant, and responsible ways. Many have cited a growing "crisis in values" in our society, where eroding connections to family, community, and place have fostered a sense of rootlessness, declining civic commitment, and lower self-

esteem. Any experience which, by contrast, results in enhanced competence, optimism, and character development is potentially important.

We believe the strength and consistency of the results reported here, when viewed along with other research findings reviewed in Appendix A, recommend making the opportunity for participation in the kinds of outdoor programs offered by SCA, NOLS, and OB far more available. Yet, only a small fraction of young people can afford or will be aware of these programs. SCA activities are the most affordable, yet relatively restricted in availability and not widely recognized. NOLS and OB programs are more widely known, although typically cost more than most young people can afford (although both organizations have endeavored to provide greater financial aide). Moreover, no matter how affordable or available these programs become, it is doubtful the organizations could or should expand much beyond current levels. Still, the three organizations could offer training to local school systems and other regional entities to implement and deliver outdoor programs.

We believe the significance of the data reported here and elsewhere strongly recommend that a major attempt be made to provide far more outdoor learning opportunities to youth in America today. At a time when young people increasingly struggle with achieving competence, control, security, purpose, and meaning, we need to take advantage of alternatives which foster these attributes. In our complex and often insecure world, we need to reach back to our ancient connections with nature to nurture physical, emotional, intellectual, and spiritual health and well being among young people.

The relative success of these programs has other broader implications for education in America today. It is always tenuous to generalize about an institution as

complex, varied, and multidimensional as secondary school education. Yet, three characteristics can be noted of most curricula and learning approaches in America today: one, they largely emphasize abstract and non-experiential learning; two, they tend to stress disciplinary specialization; and, three, they typically provide little opportunity for outdoor experience. These prevailing educational approaches can be useful when seeking to impart knowledge of highly technical and complex subject manner in a relatively efficient way. Yet, critics have also noted a number of disadvantages including tendencies to dampen learning motivation and enthusiasm, inhibit interdisciplinary and integrated understanding, and accomplishing little character and personality development.

We believe the extraordinary satisfactions and benefits associated with the programs reported here stem in many ways from contrasting educational emphases. First and foremost, these programs stress experiential rather than abstract learning. Second, they rely on outdoor rather than exclusively indoor instruction. Third, they promote integrated not specialized learning. Outdoor programs can, thus, offer a valuable means for bringing experience back into the learning process. The natural environment occurs nearly everywhere, and it requires relatively little effort to connect young people with nature. Wilderness is relatively rare today and access often difficult, yet powerful outdoor experiences can occur in almost any natural setting, even ones in relatively proximity to most schools and urban areas.

The research reported here provides only a partial understanding of the outdoor experience. Far more in-depth and focused study will be needed before we fully understand the impacts of this experience, and how we can more effectively incorporate

its full potential into more conventional educational systems and curricula. Still, the results strongly intimate the extraordinary value of pursuing this possibility.

Ours is an age that has become increasingly removed, insulated, and alienated from nature. The irony is that we may require more than ever deliberate and knowing opportunities for direct experience of the natural world. The successful development of outdoor programs offered by organizations like the Student Conservation Association, National Outdoor Leadership School, and Outward Bound may offer us a way out of this dilemma. Perhaps we can draw on the best of each program, striving to reconnect young people with the values of natural experience as an intrinsically powerful device for learning and maturation.

APPENDIX A:

ANNOTATED BIBLIOGRAPHY OF RELATED RESEARCH

Bibliography

Ajzen, I. And B.L. Driver. 1992. Application of the Theory of Planned Behavior to Leisure Choice. Journal of Leisure Research 24(3): 207-224.
Used the theory of planned behavior (adapted from theory of reasoned action) to predict leisure intentions and behavior. Questionnaire measured involvement, moods, attitudes, subjective norms, perceived behaviorial control, and intentions. Attitudes, subjective norms and perceived behavior predicted leisure intentions, and intentions and perceived control predicted leisure behavior. Involvement did not affect accuracy of prediction.

Ajzen, I. and M. Fishbein. 1976. Understanding Attitudes and Predicting Social Behavior, Theoretical Implications. pp. 127-137 *in:* J.C. Brigham and L.S. Wrightsma, (eds.), Contemporary issues in social psychology, 4th ed. Monterey, CA: Brooks/Cole Publishing Co.
Behavior is determined by personal intention. These intentions are determined by attitudes toward behavior and also toward subjective norms. Theory of reasoned action is a series of hypotheses linking beliefs to behavior, with each hypothesis requiring verification. In this paper, Ajzen and Fishbein introduce how external variables might effect their theory. They argue that on the basis of different experiences people may form different beliefs about the consequences of their actions and on normative beliefs. These beliefs then determine attitudes and subjective norms which then determine intention and corresponding behavior. It might be interesting to see how an outdoor experience fits into this model.

Backman, Sheila and John Crompton. 1985. Education experiences contribute to cognitive development. Journal of Environmental Education. 16(2): 4-13.
This paper synthesizes what the empirical literature reports regarding what best can be learned outdoors. The review suggests that the outdoors may be effective in stimulating critical thinking, increasing problem-solving skills, and developing concepts rather than rote memory. The evidence does support the teaching of environmental education and general science in the outdoors, but the evidence must be regarded as tenuous and uncertain. This report might be useful to our study if you want to examine the content of what is being taught in the experiential programs we do study.

Bacon, S.B. 1990. The Evolution of the Outward Bound Process. pp. 38-51 *in:* A.T. Easley, J.F. Passineau, and B.L. Driver (compilers), The Use of Wilderness for Personal Growth, Therapy, and Education. USDA Forest Service, General Technical Report RM-193.
Three curriculum models within OB: 1) Let the Mountains speak for themselves model, the process will produce change; according to Dewey's learning as an experiential continuum conflicts with this models b/c learning comes not from experience itself but from thinking about the experience; OB needs to provide tools for thinking about the experience, i.e., reflection; other criticisms: little proof that achieving global goals leads to specific behavior changes and does not directly concentrate on any specific behavioral change. 2) OB Plus model: focus on making cognitive links b/n the course experiences and student's life; actively attempts to promote reflection, insight, and introspection; often supplemented by integrating effective techniques into curriculum. 3) Metaphoric Curriculum Model: a way of working with OB activities which emphasizes consciously framing course events so that they serve as experiential metaphors for salient challenges in the students' daily lives. Four components: a) assessment: understanding what challenges characterize group; b) structured introductions: course of events in OB framed to address these challenges; c) double bind technology: must master physical challenge and succeed at metaphoric challenge; d) primacy of experience: learning maximized in midst of experience; experiential learning is superior to learning that is primarily reflective or cognitive; de-emphasize cognition and prioritized behavioral change, generating new behavior in the context of an experience metaphorically equivalent to a problem in daily life (e.g., the Wall); success in this context leads to an experiential rather than a cognitive insight, a "gut level" understanding. This model suggests that experiential links are stronger within individual than cognitive links provided by greater reflection time. [Their examples are for problems such as AA members or corporate employees.

Bennett, D.B. 1988/89. Four Steps to Evaluating Environmental Education Learning Experiences. JEE 20(2): 14-21.
Behavioral objectives for 1) knowledge and understanding; 2) thinking skills, including application, analysis, synthesis, and evaluation; 3) values and attitudes; and 4) action skills.

Borden, Richard and Andrew Schettino. 1979, Determinants of environmentally responsible behavior. Journal of

Environmental Education 10(4): 35-39.
A study was conducted in the fall of 1976 of 203 male and 327 female undergraduates at Purdue University. The Maloney, Ward and Braucht test, composed of four subscales (Affect, Knowledge, Actual Commitment, and Verbal Commitment) was used. The results suggest that environmental affect and environmental knowledge have a minimal degree of association. It seems that a) increased concern about the environment does not lead to the seeking of knowledge or b) conversely, the acquisition of environmental facts does not seemingly result in increased affective reactions. Environmental feelings and knowledge are not simultaneous occurrences, but instead, may be gained, through independent channels. The results indicate, however, that both affective and cognitive experiences are involved in developing the highest level of environmentally responsible action. Thus, until we know more, it seems prudent to attempt a judicious mix of the cognitive and affective domains.

Brown, Perry and Glenn Haas. 1980. Wilderness recreation experiences: The Rawah case. Journal of Leisure Research 12(3): 229-241.
This research focused on defining wilderness recreation experiences in terms of the psychological outcomes. A study was conducted of 300 people using the Rawah Wilderness area in Colorado in the summer of 1975 and five types of wilderness recreation users were identified after 264 people responded: 2 types that might be labeled the traditional wilderness user, type 3 that is characterized as not valuing risk-taking but regarding the sharing/recollection dimension, type 4 that was relatively high on risk taking and type 5 that did not value many outcomes (had the lowest mean score). What is more pertinent to our study are the eight psychological domains and their respective items identified by cluster analytic techniques of responses (see Tables 1 & 2):
1. relationships with nature
2. escape pressures
3. achievement
4. autonomy
5. reflection on personal values
6. sharing/recollection
7. risk-taking
8. meeting/observing other people

Caron, J.A. 1989. Environmental perspectives of blacks: acceptance of the "New environmental paradigm". Journal of Environmental Education 20(3): 21-27.
Attitude survey of 603 southern, urban blacks revealed pro-NEP (New Environmental Paradigm scale, Van Liere 1978) perspective by blacks. Level of education significant to perspectives; age and income did not. Compared results w/ Van Liere study (of primarily white sample) from 1978. Found that both whites and blacks were generally consistent in agree and disagree statements. Both samples showed strongest agreement with the need for humans to live in harmony w/ nature in order to survive. However, black respondents tended to agree more w/ the need for limited growth. No clear trends. Including issues of social justice along w/ env. quality would perhaps garner more blacks' support.

Chavez, Deborah J. 1991. Environmental Education: Teaching Land Ethics that Value Diversity. Trends 28(3): 9-11. US Dept. of Interior, National Park Service.
Park Service found that visitors from urban/minority groups were often using wildland recreation areas inappropriately (as though an urban, not natural, area). Using models of Project Learning Tree, Project WILD, and Project LEAD (Leaders Enhancing Awareness of Disabilities), a new environmental education program, Project ECO-action was designed to teach urban and ethnically diverse children through the use of peer facilitation, visitors, video tapes, classroom instruction, site visits (emphasized in PLT and Project WILD), and so on, in order to cultivate appropriate behaviors for wildland recreation areas. Emphasis will be only trained children facilitators teaching/leading other children in environmental education. Program also will include evaluation of self-esteem of facilitators before and after program. Manifest benefits: awareness and understanding of environment, interaction of resource managers w/ school children, sensitivity toward all children (including urban, minority, or disabled). Latent benefits: developing peer leaders; promoting natural resources as a career field for minority group members; improving visitor behavior; promoting wildland recreation areas (such as urban national forests) as education resources; increasing participation and volunteerism. Expected available for classroom use in 1994.

Cockrell, David. 1990. Changes in Self-Efficacy Through Outdoor Skills Instruction. pp. 35-37 *in:* **A.T. Easley,**

J.F. Passineau, and B.L. Driver (compilers), The Use of Wilderness for Personal Growth, Therapy, and Education. USDA Forest Service, General Technical Report RM-193.
To understand motives of wilderness recreationalists, many researchers have turned to theory of motivation, examining psychological outcomes desired and expected by participants. Increased efficacy perceptions may be an important effect of recreational and education exposure to risk in wilderness. Bandura's self-efficacy theory (1977): self efficacy expectations are cognitive representations of ability co-equal to outcome exceptions in permitting acquisition of new behavior patterns. vary on 3 dimensions: magnitude (degree of difficulty), generality (ability to apply to beyond situation), and strength (persistence). Generality of efficacy may be especially important since could measure the transferability of self-efficacy from wilderness to other. Expectations of personal efficacy come from: performance accomplishments, vicarious experience, verbal persuasion, and emotional arousal, with performance accomplishments being the most influential. Measured changes in specific self-efficacy using a Sherer self-efficacy scale (a 23 item, Likert scale). Short, experiential outdoor skills courses can produce positive changes in efficacy expectations for performance of activity-specific tasks. Greatest efficacy gains are found in those with low initial expectations. Activities that produce higher arousal appear to be more effective in producing efficacy changes.

Conrad, D. and Hedin, D. 1982. The impact of experiential education on adolescent development. Child & Youth Services 4(3-4): 57-76.
Studied 27 exp. ed. programs; determined that they can have a significant, + effect of social, psychological and intellectual development. As part of study, surveyed directors of exp. programs as to what effects were: greater sense of responsibility, more willingness to help others, increase in self-esteem, tolerance for others (different from self), clearer career focus. Created broad groupings of social, psychological and intellectual development: a) social: level of personal and social responsibility, attitudes toward others, attitudes toward active participation in community, involvement in career planning and exploration; b) psychological: general self-esteem, self-esteem in social situations, Kohlberg's moral reasoning; c) intellectual/academic growth: knowledge of issues and resources, ability to handle problems with interpersonal or ethical conflict. Looked at different program forms (community service, internship, political action, community study, adventure education) and formats (length, intensity, characteristics of individual field experience) and their corresponding outcomes.

In terms of social responsibility, found that strongest changes were toward taking responsible action as opposed to having more responsible attitude. Among attitudes, change was toward more personally responsible attitudes as opposed to socially responsible attitudes. Changes in behavior precede change in attitude. No apparent difference in changes in self-esteem for programs which held a weekly seminar or discussion, while changes in social attitudes and intellectual skills were correlated to this reflection time. Did not find any apparent differences b/n types of experiential programs and effects they studied; the characteristics of the experiences, itself, appeared to have the most significant impact on change. Characteristics of program that provided autonomy were most influential for personal growth; in contrast, social attitudes and reasoning skills required more collegial interaction w/ adults, esp. when contact initiated by student. 95% of participants rated program as either excellent (49%) or good (46%).

Suggest further studies to elicit: long run effects; who most benefits; what is best learned from this approach; and how to guide experience and reflection most effectively.

Dickerson, A. Laverne. 1977. The Youth Conservation Corps and Adolescents? Self-Concept. Pp. 143-149 *in:* Children , nature, and the urban environment. USDA Forest Service General Technical Report NE-30.
Campers? perceptions of their adequacy decreased, while their perceptions of their personal worth and social skills increased. Changes differed with gender, age, and family income of participants and with the type, location, sponsoring agency, and management style of the camps. Adolescents are deeply concerned with questions of self-concept. 3 of 4 personal and social development objectives of YCC program were used to select the dimensions of self-concept: 1) to acquire increased self-dignity; 2) to acquire increased self-discipline; 3) to better work with and related to peers and adults. 4 ways to measure these: 1) observable behavioral responses; 2) self perceptions; 3) other peoples? perceptions of the individual; 4) combination of 1-3. 2nd method used for this study. Dimensions of self-concept include: self-esteem, self-development, social skills: peers, and social skills: adults.

Driver, B.L. 1976. Toward a better understanding of the social benefits of outdoor recreation participation.

General Technical Report SE-9, USDA: FS.
This paper is focused towards recreation resource managers, but it does look at a model for gaining the ultimate benefits of outdoor recreation. It also addresses how information on these benefits can be obtained. Driver defines benefits as the user's ability to function more effectively after having participated. Such improved functioning could be physiological (better physical health), psychological (improved mental health) or sociological (increased commitments of recreationists to wise resource management because of knowledge gained from participation). Also, the improvements in effective functioning could be realized on the job (greater volume or increased quality of work accomplished), at home (increased family solidarity), or in any environment. What follows is mostly an argument for the need of this kind of research and a model for recreation behavior. The model suggests a 3 step procedure for identifying and quantifying the personal-social benefits: 1. identify & measure the relative importance of the desired & expected consequences; 2. form hypotheses about the personal-social benefits derived by clearly defined types of users who rate particular activities high in importance; 3. test the hypotheses under experimental-controlled conditions. Driver advocates using different techniques as checks on the other: questionnaires, observations and mechanical-electrical instruments. As far as what benefits should be researched, Driver points out that past research indicates that certain types of desired experiences are pervasive: developing skills; competing or achieving; learning; being creative; exploring; being with friends, the family or like-minded associates; experiencing nature; exercising; taking risks; seeking thrills or stimulation of various types; manipulating machines; seeking privacy-solitude; reflecting-introspecting; and coping with a side variety of adverse stimuli experienced in home, neighborhood and work environments. Driver then includes some of the results of a study by Knopf (1972). See Tables 1 & 2.

Driver, B.L. and Lynn Johnson. 1983. A pilot study of the perceived long-term benefits of the Youth Conservation Corps. Journal of Environmental Education.
YCC is a combined work and environmental education program for youth ages 15-18. The enrollees spend from 4-8 weeks in summer residential or non-residential camps. Research on possible long-term effects was begun in 1978. This paper reports on one of the pilot studies made of 600 enrollees and 600 parents in the 1972-1975 programs. Some of the self-reports were provided 3-6 years after participation. Specific objectives were to: 1. determine if YCC participation improved some attitudes, skills, and behaviors; 2. determine if benefits varied according to types of enrollees (sex, age, race, etc.) or different types of YCC camps; and 3. to identify possible social benefits of the YCC beyond those realized by the enrollees. 57 questions by cluster and factor analyses were reduced to 16 empirically defined benefits scales. These were: environmental career, environmental awareness, conservation behavior, active involvement in natural resources, tool skills and safety, practical outdoor skills, interests in career, education and other activities, outdoor recreation interest, outdoor work enjoyment, being responsible, ability to work with others, respect for others, self-confidence, more aware of good qualities of self, interpersonal skills, appreciation of home and parents, physical fitness. The areas were parents and enrollees agreed were: environmental awareness, tool skills and safety, outdoor recreation interest, and ability to work with others. See Table 1. No significant differences were found in responses when stratified by race, type of camp, agency sponsoring camp, year of enrollment, region where camp located, or age. The female enrollees sampled rated the influence of the YCC experience on 5 of the benefit scales.
These results were compared to a nationwide longitudinal study of high school seniors. Differences suggest that YCC enrollees spend their leisure time differently and they watch TV less and spend more time reading and participating in community affairs.
Respondents were asked to list benefits YCC had on other people and on society in general. These included: development of leadership qualities, greater satisfaction with life, learning the meaning of hard work, improved conservation behaviors, direct benefits such as the construction of public facilities, and the changes in adult attitudes towards young people-that they are responsible, caring and environmentally aware.

Driver, B.L., Roderick Nash and Glenn Haas. 1987. Wilderness benefits: A state-of-knowledge review. In R.C. Lucas (ed.) Proceedings of the National Wilderness Research Conference, Ft. Collins, CO: USDA Forest Service General Technical Report INT-220; 294-319.
a) This article describes the need for more information on wilderness benefits. It reviews scientific and nonscientific literature on wilderness benefits and classifies benefits as personal, social and intrinsic. It points out that most knowledge about benefits is based on introspective appraisals of benefits inferred from human preference studies. According to the authors, six values seem to represent the core of a wilderness philosophy: preservation for links with the past, learning and scientific research (ecological); spiritual; aesthetic; inherent/intrinsic (ethical); historical and cultural; recreational. It is also interesting to look at what they consider less central values. See entire article.

b) Delimitations: 1) some benefits not yet identified; 2) studies use self-reports in questionnaires that measure users' subjective appraisals of benefits instead of measuring actual behavioral changes; not sufficiently systematic: small and nonrandom samples, nonresponse bias unaccounted for, no control, no longitudinal studies, too broad generalizations; 4) no studies of vicarious users; 5) overlap b/n wilderness-related and nonwilderness uses; 6) frequently impossible to determine if benefits reported or inferred were uniquely attributable to wilderness.

Types of Benefits:

1) Personal: developmental (self-concept, self-actualization, skill development and application, academic achievement and acceptance of others), therapeutic/healing (clinical and nonclinical), physical health, self-sufficiency, social identity (esp. family cohesiveness), educational, spiritual, aesthetic/creativity, symbolic, commodity-related, nurturance;
2) Social: aggregate personal, spinoff, historical cultural, preservation (representative ecosystems, species diversity, unique landforms/historic sites/educational values/options for research, stewardship), quality of life, commodity related, economic (national, regional, local)
3) Inherent/intrinsic.

Burton (1981): "Outward Bound-type programs do have positive effects...most substantial in the area of self-perception (self-concept, personality, locus of control and self-assertion)" even though few behavioral correlates were found. Two studies made follow-up measurements 5 years after the programs ended. Beneficial behavior changes may be greatest after a period of time not covered by most studies.

Driver, B.L., G.L. Peterson, and A.T. Easley. 1990. Benefits Perceived by Past Participants in the NOLS Wind River Wilderness Course: A Methodological Inquiry. pp. 52-63 *in:* A.T. Easley, J.F. Passineau, and B.L. Driver (compilers), The Use of Wilderness for Personal Growth, Therapy, and Education. USDA Forest Service, General Technical Report RM-193.

Objectives of study: 1) determine how well participants could identify/articulate perceived benefits; 2) measure participants' perceptions of: a) desirability of benefit, b) degree benefit realized, c) influence of course on realizing benefit; 3) determine differences b/n participants in dispositions to course; 4) determine if different types of participants differed in benefits perceived using market segment techniques. Methods: two questionnaires, T1 open-ended, T2 fixed list format. Sampled at least 200 participants for each of years 1974, 75, 81, 82 and 83. 81 benefits items and 16 disposition items in 2nd questionnaire. Used desirability responses to develop benefit scales. Participants could articulate diverse but well-defined set of perceived benefits w/o prompting. Many of perceived benefits reflected goals of WRWC. Other perceived benefits emerged that were not promoted by NOLS (humility, tolerance of others). Possible to measure affective disposition toward the course with multiple-item inventory and thus obtain differential responses to perceived benefit scales. Differences by socioeconomic characteristics existed and affected perceived benefits and desirability of benefits. Methodology enabled measurement of: perceived benefits, desirability of benefit, perceived changes along each dimension of benefit, attribution of change to program. Suggests that future studies include participants from different types of courses at different locations, have a wider inventory of disposition items, use variables that define different aspects and components of the course, and obtain an appropriate response rate.

Driver, B.L. and D.H. Rosenthal. 1982. Measuring and Improving Effectiveness of Public Outdoor Recreation Programs. USDA Forest Service, Rocky Mountain Forest and Range Experimental Station. Fort Collins, CO.

Provides a framework for Outdoor Recreation Program Evaluation (ORPEF). Positive impacts (benefits) to be measured were listed as: *behavioral change benefits* (improved functioning or performance); *psychological benefits* (satisfying experiences); collective social benefits: national, regional, and local economic benefits, *spinoff benefits* to society; and resource enhancement and preservation benefits for current and future users.

Ewert, Alan. 1983. Outdoor adventure and self-concept: A research analysis. Eugene, OR: Center of Leisure Studies, University of Oregon.

This is a comprehensive analysis of research on outdoor adventure education up to 1982. Sections include: self-concept and academic achievement; survival training and self-concept; self-concept and outdoor wilderness experience; educational programs that use outdoor adventure; and OB and self-concept. Perhaps the most important idea from this paper is the need to determine the *relationship between program outcomes and program components*. We know what

OB can do, but we don't know how. There is a very good and interesting review of the history and application of self concept. Something that came through here is that self concept is important b/c the feelings one holds about self (i.e., self concept) directly motivate one's behavior. Fitts and Hamner (1969) assert that change in self-concept is generated by meaningful, significant experiences but that these changes only affect behavior after they have had time to be internalized and incorporated. a) academic achievement: In a six year longitudinal study of the relationship b/n self concept and academic achievement, Brookover et al. (1964) found that though a high positive self-concept does not *cause* high academic achievement, it is a necessary personal quality for this achievement (i.e., a high self-concept does not alone guarantee high scholastic achievement). In contrast, a *poor* academic achievement will damage self-concept, whether the student places importance on this or not. Self-concept is both antecedent and predicated upon an individual's acad. achievement (sort of a chicken-and-egg relationship). b) survival training, outdoor wilderness experience, and OB: This has been among the most interesting and useful summary articles thus far. The overview of studies restate the variety of results and relationships found in other studies and also points to flaws and advantages in methodology.

Ewert, Alan. 1986. Fear and Anxiety in Environmental Education Programs. JEE 18(1):33-39. Subjective self-reports of fear, such as in questionnaires, are often different from observed physiologic responses. Verbally or written, people tend to overestimate their fear. Behaviorally, people participate in activities for which they are more afraid than they appear. Educators need to use a combination of inquiry and observation to gauge level of fear in educational and recreational systems. Difference between positive stress (eustress) from which participant can feel fulfillment and negative stress (distress) where person feels impending failure or inescapable pressure. Adventure activities such as kayaking or rock climbing can create positive stress (emotional release, expanded perspective, heightened personal limits, and singleness of mind or attention, enhanced learning through greater personal involvement), which are often the cited goals of including these activities in env. education programs. Developed a 40-item instrument to weight importance of various fear items related to outdoor instruction. 60 students in Outdoor Bound program tested. Greatest fear for: enough food, holding others back, not fitting in, not getting money's worth, i.e., most fear centered on social rather than situational concerns (such as falling). The greater the perceived risk (whether socio-psychological or situational), the greater the felt need for information.

Ewert, Alan. 1988. Reduction of trait anxiety through participation in Outward Bound. Leisure Sciences 10(2): 107-117.
This study is only marginally relevant to ours, but some principles were useful. Two groups were compared (treatment and a control group) using a modified version of Spielberger's State-Trait Anxiety Inventory. In addition, assessment was completed by instructors. Testing was done before the program, immediately after and one year after the course ended. The findings suggest that participation in an outdoor recreation based program such as Outward Bound can be effective in reducing levels of trait anxiety, although this effect diminishes over time.

Ewert. Alan. 1989. Outdoor Adventure Pursuits: Foundations, Models and Theories. Scottsdale, AZ: Publishing Horizons, Inc.
This book is a good overview of outdoor adventure experiences. Two chapters are especially relevant: The Benefits of Outdoor Adventure Pursuits and Research and Evaluation in Outdoor Adventure Pursuits. The benefits chapter includes: psychological, sociological, educational and physical benefits. See book, pp 47-58. The research chapter includes types of current research methods, a summary of selected research analyses, current topics, research issues, and recommendations. Again, I suggest reading the chapter: pp. 103-116.

Finger, Matthias. 1994. From knowledge to action? Exploring the relationships between environmental experiences, learning and behavior. Journal of Social Issues.
This was report on two surveys of 786 and 1004 Swiss respondents in 1988 and 1992 respectively. The study is of some relevance to our study in that the author shows that environmental information, knowledge and awareness predict little of the variability in most forms of environmental behavior. The main factors predicting environmental behavior, or absence thereof, are experiences in and with the environment. In the author's view, today's major challenge for environmental educators stems from the fact that individuals are already highly aware and concerned when it comes to environmental issues and problems, yet do not display the corresponding environmental behavior one could expect.

Finkenberg, Mel, David Shows and James DiNucci. 1994. Participation in adventure-based activities and self-concepts of college men and women. Perceptual and Motor Skills. 78(3): 1119-1122.

This study was small, but relevant. A sample of 18 students enrolled in a semester-long adventure education class and 32 in a general health class were administered the Tennessee Self-concept Scale to assess the effect of participation in adventure-based activities on self-concept. This study is unique, inasmuch as a "normal" group of college students were studied. Items tested both during the first week of the semester and during the week before the semester ended were: physical self, moral-ethical self, personal self, family self, social self, identity, self-satisfaction, behavior, and self-criticism. For men, significant differences were found on physical, social and behavior scales and for women differences were found on the physical and personal scales. In both cases, those students who took the adventure course had higher self-esteem scores. See Table 1.

Gillett, D.P., G.P. Thomas, R.L. Skok, and T.F. McLaughlin. The effects of wilderness camping and hiking on the self-concept and the environmental attitudes and knowledge of twelfth graders. 1991. JEE 22:33-44.
6-day wilderness experience increased 3 of 10 measures of self-concept in the Tennessee Self-Concept Scale and 2 of 5 measure in the Coopersmith Self-Esteem Inventory and in environmental knowledge. No change in attitude was found. Control group did not significantly change in any of the measures. Used two scales to test self-concept: TSCS consists of 90 items classified into 15 areas representing combinations of internal and external facets of self-concept (they used physical, ethical, personal, family, social, self-criticism, identity, self-satisfaction, behavior, and total self-concept scales); SEI consists of 50 questions related to attitudes in four different areas of activity: peers, parents, school, and personal interests, includes an 8 question lie scale. Shavelson et al. (1976) and Wylie (1979) have argues that the construct validity of the SEI is weak. Cross Regional Environmental Attitude Survey (Ignatiuk 1978). Potential source of invalidity to self-concept responses is the "post group euphoria" (Marsh et al. 1984). Shepard and Speelman (1986): Outdoor education program (4-H camp) had positive learning experience but no significant effect on environmental attitudes. Ignatiuk (1978): exposure to field-trip activities longer than 2.5 days has a positive effect on students' attitudes toward certain environmental concepts. Optimum number of days is about 5, because increases are not as great in field trips of longer duration. Simpson (1985): wilderness experience assumed by educators to bring individual closer to natural world and instill env. ethic, but short-term wilderness trip may not change value systems of participants. Quality of experience rather than length of duration more important in changing values and perceptions.

Godfrey, Robert. 1974. A review of research and evaluation literature on Outward Bound and related educational programs. An informal paper presented at the Conference on Experiential Education, Estes Park October 8-11, 1974.
Godfrey points out threats to internal validity of research of this nature: 1. maturation: perhaps changes we observe are simply due to the fact that individuals have grown older; 2. testing: perhaps students are second guessing the desired responses; and 3. selection of individuals: control groups must be similar to participants. Godfrey then reviews studies of Outward Bound programs and briefly reports on their findings; these include: strengthening of self-image, better social functioning, more stable, dependable, critical individuals, changes in self-concept and self-image, more control over personal fate, changes in personality and values, more tolerance of others, greater awareness of the needs of others, greater ability to mix well, self-confidence, lower anxiety levels.
Studies of educational program related to OB found: students became more outgoing, affected by feelings, assertive, tender-minded, self-controlled; that students exhibited a higher degree of internal control; that students acquired a more positive, self-confident image of themselves and courage to face the world; that students had an effect on their future goals and related better to their parents, friends and other races. Godfrey finally points out two works: Harmon (1974) to help OB develop a series of goals and Smith (1973) who studied self-esteem, self-awareness, self-assertion and acceptance of others. See copy of report.

Hanna, Glenda. 1992. Ripples in the water: Reflections on experiential education research designs. Proceedings Manual, AEE 20th International Conference. October 8-11, 1992, Banff, Alberta, Canada.
Hanna reports on the wide variety of research designs used in experiential education, both qualitative and quantitative. See Table 1. She also reports on the chronic design and methodology problems. See Table 2.

Hanson, R.A. 1977. An Outdoor Challenge Program as a Means of Enhancing Mental Health. In Children, nature, and the urban environment (pp. 171-173). USDA Forest Service General Technical Report NE-30.
Natural environment provides setting for clarity and effectiveness of psychological functioning: "When a contemporary man speaks of a need to return for a time to the wilderness, he is in essence going back to the wilderness, he is in essence going back to where his significant psychological processes developed."

How Participants Change: Return from 2-wk program stimulated, active, hopeful, eager, and proud, with new goals/ambitions. Talk about wanting to change passive behavior (using drugs, begin afraid of dark, no interest in future). After few days in wilderness, ties to previous environment loosen and see themselves in new, more active position. Stronger, clearer relationship to world and strengthened self-concept. Strengthened object relationships (through exploration of place). *Values that Endure*: Object relations view may shift from one of fear or dependence to objects and people as possibilities to explore, learn about, to try new relationships with. Evolutionary importance. Efficient and active behavioral system.

Hartig, Terry. 1993. Nature experience in transactional perspective. Landscape and Urban Planning 25:17-36.
Natural and built places bound together by on-going process of evaluation/differentiation b/n two. Interactional: treats events separately, temporally distinct, e.g., impact of variables on emotion or stress. Transactional: convergence of time, space, of people, activities, setting; more strongly ties to place of residence and impact of experience; individuals and contexts jointly define each other.

Motivations for outdoor recreation: escape (highest correlation b/n urbans and desire to get away); pull of natural environment: religious/aesthetic experience, tranquility, solitude, enjoyment of nature. Solitude and nature appreciation central to realization of psychological benefits (Driver et al. 1987). Primarily visual experiences may be beneficial for people who seldom enter local natural areas (Ulrich, Kaplan). Stress reduction, either in recovery or every-day situations (Ulrich) Declines in negative (aggression, anxiety, sadness, skepticism, egotism) and positiveness (cheerfulness, elation, vigor, social affection) after visit to sanctuary (More and Payne 1978). Benefits may include: developmental, therapeutic/healing; physical health; self-sufficiency; social identity; educational; spiritual; symbolic; aesthetic/creative (Driver et al. 1987). personal, emotional, cognitive & social outcomes; improved physical health, fitness, increased appetite; enhanced self-concept, self-esteem, self-confidence; increased initiative; increased patient enthusiasm and fun; improved school attitudes & behaviors; discharge from hospitals; shorter hospital stays and reduced recidivism rates; fewer emotional problems and pathological symptoms; development of new interests and improved skills (Levitt 1988). Increased concern for others, more realistic assessments of strengths and weaknesses, greater self-sufficiency (Kaplan 1974). Self-esteem (Kaplan 1977). Increased interest in environment, ability to explore and understand environment (Kaplan and Kaplan 1989).

Attn/concern shown by the guide or therapist may be more important than the natural setting. Benefits from one program experience may not be as deep or lasting as those that accrue to wilderness users who are self motivated to go to wilderness regularly (Schreyer et al. 1990). Measuring perceptions of being away, fascination, coherence, and compatibility will help map relations between restoration outcomes and the processes thought to contribute to them (Hartig, this study).

Hartmann, L.A. and H.K. Cordell. 1989. An overview of the relationship between social and demographic factors and outdoor recreation participation. Pp. 255-274 *in* Watson, A.H. (compiler), Outdoor Recreation Benchmark 1988: Proceedings of the National Outdoor Recreation Forum, Tampa, Florida, January 13-14, 1988. USDA Forest Service General Technical Report SE-52.
Using PARVS (Public Area Recreation Visitor Study, 1985-87) and literature review, this article presents an overview of the relationship of age gender, income, education, and occupation plus disability, ethnic minorities, and coparticipant groups to outdoor participation. More whites than non-whites, non-disabled than disabled, and group than non-group participation in outdoor recreation areas. Federal and State public recreation areas are mostly serving young, white, well-educated and able-bodied middle class. Older, nonwhite, lower income, the disabled, and the wealthy are found recreating on these lands in smaller proportions relative to their numbers in the US.

Hausbeck, Kathryn, Lester Milbrath and Sean Enright. 1992. Environmental knowledge, awareness and concern among 11th-grade students: New York state. Journal of Environmental Education 24(1): 27-34.
This article reports on a 1990-1991 study of approximately 3,200 11th graders in New York State. The results found that although students scored rather low on knowledge questions, they displayed higher scores on awareness and concern, and 56% of the students reported that they would like additional environmental education to be offered in school.

Hazelworth, Maureen and Beth Wilson. 1990. The effects of an outdoor adventure camp experience on self-concept. Journal of Environmental Education 21(4): 33-37.

Four sessions of a coed outdoor adventure camp were evaluated in the summer of 1987 in Raleigh, NC to determine the effects on self-concept of the 39 teenage participants. The Tennessee Self-concept Scale was administered at the beginning of each camp session and again at the end of the 6th day of each session. Nine areas of self-concept were evaluated. Although the results were inconsistent, the differences could be attributed to differences in organization of each camp session; for example, session 3 was organized to foster group cooperation within "family" units. However, overall analysis of self-concept showed significant positive changes in moral-ethical self-concept, identity, and self-satisfaction.

Hines, Jody, Harold Hungerford and Audrey Tomera. 1986-7. Analysis and synthesis of research on responsible environmental behavior: A meta-analysis. Journal of Environmental Education 18(2): 1-8.
A meta-analysis of 128 studies of environmental behavior research since 1971 was undertaken to determine which variable or variables appear to be most influential in motivating individuals to take responsible environmental behavior. The results indicate that the following do: knowledge of issues, knowledge of action strategies, locus of control, attitudes, verbal commitment and an individual's sense of responsibility. Demographic variables were also examined: people with higher incomes, higher education, and who were younger tended to engage in more responsible environmental behavior. There was no gender difference. See model.

Hungerford, Harold and Trudi Volk. 1990. Changing learner behavior through environmental education. Journal of Environmental Education 21(3): 8-21.
This article is somewhat relevant in that it reinforces the idea that issue awareness does not lead to responsible environmental behavior. Students must be given the opportunity to develop the sense of "ownership" and "empowerment" so that they are fully vested in an environmental sense and prompted to become responsible, active citizens. Also, it appears that environmental sensitivity is a function of an individual's contact with the outdoors in relatively pristine environments.

Hutchinson, Ray. 1988. A Critique of Race, Ethnicity, and Social Class in Recent Leisure-Recreation Research. Journal of Leisure Research 20(1): 10-30.
Research on black-white differences have not yet produced conclusive or cumulative results: some studies attribute black-white differences to activities and others suggest other factors, such as income or occupation, as the cause of recreational differences; conflicting or missing results from various studies. Lack of unified conceptual and theoretical frameworks; lack of definition b/n race and ethnicity. Theories for minority participation: *compensation* (individual response to discrimination by society-in-general); *ethnic community/racial identity* (collective response); and *marginality perspective*, differences in recreation may be explained by a) differential access to recreation resources due to lower discretionary income of minority groups, and b) inequitable distribution of recreation facilities. These positions suggest very different responses for meeting needs of ethnic/racial groups.

**Minority groups are under-represented in the national park setting due to their predominantly urban residence, and their relatively small numbers and well-known problems of interviewing means that they are not recorded in national or state surveys in sufficient numbers for detailed statistical analysis.

Criticisms of research: a) references to inappropriate background research (which focused on *social* differences but not *ethnic*; b) unclear definitions of race and ethnicity; c) neglect of published research in race and ethnic relations; d) lack of attention to activities of groups other than black.

Definitions: *Ethnicity*: membership in a subcultural group on the basis of country of origin, language, religion, or cultural traditions different from the dominant society. *Race*: socially constructed definitions of physical differences. Specificity of *ethnicity* in black community difficult. Maintaining a distinction here is critical in attributing results to ethnicity of some groups and race of others; not the same thing. Blacks don't form a homogenous pop. group; same true for whites, no single culture.

Hutchinson, Ray and K. Fidel. 1984. Mexican-American recreation activities: A reply to McMillen. Journal of Leisure Research 16(4): 344-349.
Found substantive and systematic differences in the social organization of recreation activities of Mexican-American and Anglo groups in Chicago parks. These conclusions contradict an earlier study by McMillen in 1983; differences may be

related to importance of family unit in Mex-Am culture. Anglo groups used parks mostly for mobile activities (jogging, walking and bicycling alone made up 45%), while Mex-Am.s used parks for playgrounds, lounging and as spectators of sporting events. Differences may be attributed to size of groups (and therefore type of activity), age (younger in Anglo group), and gender groupings (more mixed groups in Mex-Am.).

Iida, M. 1976. Adventure-Oriented Programs -- A Review of Research. pp. 219-239 *in:* van der Smissen, B. (ed.), Research camping and environmental education. University Park, PA: Penn State HPER Series No. 11.
Just what it says: A review of research. There is a good discussion of problems with research design and suggested further study.
Self-Concept: Smith et al. 1975: 600 subjects, time series design, four variables -- self assertion, self-esteem, acceptance of others, and self awareness; OB + impact on self assertion; affects self esteem; partial but weak acceptance of others; no shown impact on self awareness. Ulrey 1974: locus of control orientation and behaviors of pre-adolescents; 83 campers and 57 controls; Nowickie and Strickland Locus of Control Scale and Intellectual Achievement Responsibility Questionnaire; treatment created more internal loc but no impact on behavior. Vander Wilt et al. 1971 measured self-actualization using the personal orientation inventory; ob significantly improved self-actualization process only of females. Wetmore 1972, used TSCS on 219 boys; distinct positive change (9 of 10 variables) immediately after course; 2 of 10 categories significantly changed 6 months after course; no correlation to age or socio-economic status. Kaplan 1975 evaluated self-esteem using Rosenberg Self-Esteem Scale. Also cites numerous studies for delinquent children and mentally ill. *Personality*: Sixteen Personality Factors Questionnaire and Gough Adjective Check List used most frequently. Sundry other test listings w/in this section. *Anxiety and Fear*: Important to measure b/c outcomes of program depend on participant's reaction to challenging activities and stressful situations. Confronting and overcoming fear central (?) to improvement of self-concept and other measures. This area, Iida suggests, has been little studied but it important in perhaps answering the HOW of change. Koepke 1973, state anxiety will change and will be related to self-concept; used State-Trait Anxiety Inventory; Davis 1972, relationship of fear during rock climbing and self actualization; fear must be overcome b4 self actualization and self awareness can be expected. *Achievement Motivation and School Performance:* Most results showed that it cannot be concluded that adventure oriented programs affect achievement b/c too many variables, methodological problems. *Leadership, outdoor living skills, environmental awareness, attitudinal changes:* leadership opinion questionnaire (Baker 1975), Environmental Preference Survey (Hartung 1973), outdoor living skills (Kaplan 1972), attitudinal changes (personal values, social and political issues, physical stress) measured by Gillette 1971.

Johnson, Lynn and B.L. Driver. 1982. An approach to measuring the perceived benefits to volunteers in natural resource agencies. Proceedings: Volunteer in the Backcountry. Amanda Merrill (ed.) University of New Hampshire, Durham.
This is a "how to..." : how benefits realized by volunteers might be identified and measured. The model used was the same as for the 5-year study done for the YCC program in 1978. Some useful suggestions are: setting objectives; after a literature review making a list of possible benefits; surveying program administrators to refine that list; conducting a pilot survey; grouping the possible benefits into categories (for example: the YCC study came up with the following: increased environmental awareness; improved work attitudes, skills, habits; improved ability to get along with others; increased self-confidence; and improved basic orientation to life); setting a control group, surveying parents of enrollees; testing 6 months and 26 months after the program to test for long-term benefits; paying $3.00 to get more responses. See Appendix for the benefits measured and questionnaire items used to measure each benefit in the YCC study.

Kaplan, Rachel. 1974. Some psychological benefits of an outdoor challenge program. Environment and Behavior 6(1): 101-116.
This paper describes an initial attempt to evaluate the benefits of the Outdoor Challenge Program in Michigan's Upper Peninsula. The data is based on 10 people who spent 2 weeks in the program in the summer of 1972. (small sample size!) 25 were in the control group. Questions Kaplan raises are: are the effects long-lasting, what changes occur in the control group, and who chooses to participate in such programs in the first place.
Data were collected at 4 points in time: the first & last involved the entire sample and were questionnaires administered before the program (late May) and after (October). Phase II & III were only administered to the participants in the Outdoor Challenge Program. Phase II questionnaires were sent along with registration material: this covered material on prior camping experience and attitudes toward nature. Phase III was gathered immediately following the close of the program and tested for changes in attitude and skill. One of the central foci of the study was the evaluation of self-

esteem. Given to the entire sample was The Rosenberg Scale of Self-Esteem. Another approach to the self-esteem issue involved a series of 22 items for which the subject indicated how well the description fits him, using a 6-point scale. Included here were statements dealing with working with people, doing a good job, having a realistic outlook, new challenges, leadership, and the like. Another test involved a list of 58 activities and having the students rank how much they care about them. In addition, there were some open-ended questions.
Questionnaires completed only by the program participants included a list of 10 items dealing with the kinds of skills the program entailed. These items were included in both Phase II & III. Phase III material included various open-ended questions dealing with the good and bad features of the program, the most challenging or hardest experiences, the differences from expectations and what a friend might want to know beforehand.
The final results found that the participants felt very positive towards the program. They found it an exhilarating, challenging, exciting experience. They felt they had learned specific skills, and learned to handle a variety of fears, learned about the woods and learned about the world. See the description of longer-term changes and self-descriptions.

Kaplan, R., 1977. Summer outdoor programs: their participants and their effects. in: Children, nature and the urban environment: Proceedings of a symposium fair (USDA Forest Service General Technical Report NE-30). USDA Forest Service Northeastern Forest Experiment Station, Upper Darby, PA, pp. 175-179. Even relatively short encounters with the outdoors results in pervasive changes, the most striking relate to increased competence in skills required for woods. Aims of research: whether benefits of program lasted beyond program itself; whether acquisition of specific skills is what enhances self-confidence; whether effects are specific to particular kinds of programs. Methods: pre-test, 6-month post-test. Questions asked about: 1) activities that participants cared about and how competent they were at each; 2) woodsmanship skills (outdoor life skills, such as setting up camp, map reading, hiking, ecology, finding food in woods); 3) friendship skills (interpersonal skills, such as making new friends and getting along with strangers in confined situations); 4) reasons for choosing activities; 5) self-esteem, broken into components such as realistic task orientation, challenge, self-reliance and interpersonal. Both positive and negative questions; and 6) open-ended questions such as, "how would your best friend describe you", etc. First questionnaire also included Environmental Preference Questionnaire. [Technicalities of these questions in R. Kaplan, 1977. Patterns of environmental preference. Environmental Behavior, 9: 195-216, which Cilla has.]

Results: *Skills*: Outdoor Challenge participants showed highly significant improvement in woodsmanship skills. *Skills and Self Views*: Significant relationship between woodsmanship skills and domain of self-esteem (realistic about demands of work and to gage personal task-related limitations). Outdoor Challenge people less likely to express negative views of themselves. Close to half of those who participated in summer programs and had originally scored low on positive view improved at post test. Only a quarter of control improved this way. While control groups concerned with stereotypical teen interests (motorcycles, cars, music, dating), campers expressed social commitment, consideration for others, self-discipline and personal growth; Outdoor Challenge and backpacking groups showed little desire to change their physical characteristics. OC people showed least concern for interpersonal activities but felt better at getting along with others.

Kaplan, R. and Kaplan, S. 1989. A Wilderness Laboratory. pp. 121-149 *in*: The Experience of Nature: A Psychological Perspective. Cambridge: Cambridge University Press.
Five topics of questionnaire (5-point scale): 1) how well knew different aspects of the setting (layout of land, plants, water, etc.); 2) how much each of 10 physical characteristics helped provide a *sense of place*; 3) how misleading or confusing each of these seemed; 4) sources of worry; 5) how much certain things contributed to being comfortable. Administered questionnaire at 4 points: before, after one/two days, at end, some time after.

Found that after a few days, desire for knowledge wanes, participants "voiced the feeling that one does not need to have or need to know a lot in the woods." Relates to an extremely rapid rate of change in people's sense of comfort and confidence. Most participants experienced some type of re-entry after wilderness experience.
Do these experiences enhance/change experience of nature in other areas? Kaplan, R. 1974: *self-perceived competence related to self-esteem; higher competence scores corresponded to higher self-esteem. *compared to controls, outdoor challenge participants wished for physical change of self (height, etc.) significantly less. * outdoor challenge participants did wish for independence, self-discipline, patience, self-reliance.

Burton 1981 dissertation: gains of outdoor challenge programs largely in self concept (realistic perception of strengths

and weaknesses); more evident in delinquent population; no apparent, consistent gain in such characters as grade point average, "behavior", self-actualization, or self awareness.

Kaplan, S. 1977. Tranquility and challenge in the natural environment. In Children, nature, and the urban environment. USDA Forest Service General Technical Report NE-30.
Nature experience provides a sense of cognitive *clarity* or, conversely, the absence of confusion. Clarity is "perhaps most urgent and powerful for the adolescent". Challenge and fascination (with process and with content) help to improve clarity. Link between clarity and pleasure is physiological. 3 possibilities for personal growth through Outdoor Challenge Program: 1) involuntary attention that is active; individual is locus of control; enhances self confidence and competence; 2) skill learning relevant to nature difficult to dismiss because nature communicates its importance through the attention it demands and the clarity it evokes; 3) clarity important for adolescent who is beset with unclarity concerning self and relation to others; may be critical point for resolving issues. Among common ways of achieving clarity are reliance on social support/peer groups and adoptions of simplifying world view (us vs. them); clarity through challenge and fascination with natural environment may provide alternate route to clarity and could have lasting impact on character and functioning of individual.

Kaplan, Stephen and Janet Talbot. 1983. Psychological Benefits of a Wilderness Experience. In Behavior and the Natural Environment. Altman & Wohlwill (eds.) NY: Plenum Press.
The authors have found that psychologists have focused their research on two distinct issues: 1. what values are perceived in wilderness; and 2. what lasting psychological impacts can result from extended encounters with wilderness. Regarding the first issue-values perceived: studies have yielded rich, but somewhat confusing evidence regarding the nature of wilderness experiences; there is little agreement concerning which element (solitude, group functioning, stress or escape) is essential to the character of a wilderness encounter. Two findings that are consistent are that social concerns are of minor concerns in wilderness experiences and that enjoyment of nature is of primary value. The research on the impacts of wilderness experiences is more pertinent to our study. Here the authors focused on the hypothesis that lasting changes in individuals are produced by wilderness experiences. The wilderness experiences is viewed as a powerful therapeutic tool, encouraging new behavior patterns and self-perceptions in the participants.
The report then went on to examine the Outdoor Challenge Research Program (as discussed in Talbot and Kaplan 1986) The methodology used consisted of: on the first day of the trip the participants complete a number of questionnaires, the participants are also given a journal on the first day to use for the rest of the trip, a few questionnaires are filled out through the course of the trip, and a final set of questionnaires is administered after the group has arrived back in town. The participants' experiences seem to have left them with an increased sense of purpose in general, a desire to be intensely involved in a variety of interests. The one exception to this finding is in the area of control; the participants' need for determining their own activities was not increased by their experiences in the wilderness. Journal analysis found interesting observations on situation stress, enjoyment, fascination and sensory awareness and perceptual changes. See Table 4. Journals kept after reentry found changes in wilderness perspective, nature tranquillity and new activities. See Table 5.
Areas of theoretical interest are just what is special about wilderness? What are the factors that make the observed effects different from what might occur in other settings. These include: being away, fascination, "other worldliness", concept of coherence, action and compatibility.
The psychological benefits appear to unfold gradually during the course of a wilderness trip and seem to include self-insights that imply lasting changes in the participants. These include: an intense awareness of the relationship between the individual and the physical environment; an increase in self-confidence and a sense of tranquillity. There is coherence as well--things are starting to fit together at many levels; there is a strong inclination toward contemplation and with it comes a feeling of relatedness to the surrounding environment that approaches awe. In conclusion, the authors grouped deeply felt human concerns that wilderness has an impact on as follows: 1. tranquillity, peace, silence; 2. integration, wholeness; 3. oneness. See copy.

Kiewa, Jackie. 1994. Self-control: The key to adventure? Towards a model of the adventure experience. Women and Therapy. 15(3-4): 29-41.
Adventure provides a powerful learning experience. Four components are identified which create a powerful one: an experiential learning base; a simple yet meaningful reality; cooperation; and intensity of feeling. Four more are needed to make it a positive one: a means of processing the experience, success, choice and a humane climate. A major outcome of the adventure process is the development of self-control. The author takes several models of the adventure experience,

including the Outward Bound model, and combines them to create the optimal positive experience and for self-control which lead to enhancement of self-insight, self-esteem, confidence and a sense of personal power and freedom. See diagram 1. The author admits the model neglects an area of importance: the effects of the wilderness environment on the participant.

Kolb, David. 1988. Self-esteem change and mandatory experiential education. Journal of Experiential Education 11(3): 31-37.
The unique features of this study is that is examines self-esteem in a "normal" population in a required program, as opposed to the more typical studies of troubled people with low self-esteem. Overall self-esteem, physical self-perception, peer relationships and emotional well-being were studied here.
The program was the Westminster Discovery Program for freshmen at the Westminster School in Atlanta, GA. It is a ten-week program consisting of a two-hour weekly class and 3-day expedition. A Solomon four group design was used; this design utilizes a combination of pretest/posttest and posttest only methods with a treatment and control group for each method, thus the four groups (?). The value of mandatory participants is that the study has a better representation of change resistance. The total sample consisted of 87 subjects, 41 treatment and 46 control. The Piers Harris Children's Self-Concept Scale was the instrument used in the study. It tests for specific areas of self-concept: behavior, intellectual and school status, physical appearance and attributes, anxiety, popularity and happiness and satisfaction. See Table 2 for results. The results indicated significant positive change after participation in the Discovery Program. Significant differences were found between treatment and control groups in all areas except the anxiety cluster.

Levitt, Lynn. 1988. Therapeutic value of wilderness. General Technical Report Southeastern-51, USFS.
This article focused primarily on those individuals with psychological and social disorders, however some of the issues discussed were useful to other groups and the benefits of the camping experience. Specifically, the major personal, social, emotional and cognitive benefits discussed relevant to our study were:
1. improved physical health, fitness and increased appetites
2. enhanced self-esteem, self-concept, and self-confidence
3. increased initiative
4. increased enthusiasm and patience
5. improved school attitudes and behaviors
6. changes in group problem solving
7. fewer emotional problems
8. development of new interests and improved skills
9. establishment of friendships
10. increased quality and quantity of social interactions
(see p. 159 for summary)

Lisowski, M. and J.F. Disinger. 1991. The Effect of Field-Based Instruction on Student Understandings of Ecological Concepts. JEE 23(1): 19-23.
A study to measure the influence of field instruction strategies on students' understanding and retention of ecological concepts. Some, but infrequent, cognitive-focus in-the-environment education exists, and a meager research base in this area. Developed the Student Ecology Assessment instrument to obtain students' understandings of concepts related to ecology and feeding relationships. Also developed attitude form, to identify variables such as interest in science, involvement in science-related activities, sex, academic achievement, learning style preference, and travel and outdoor experience.

Students who participated in the study showed statistically significant gains in posttest scores, as compared to pretest scores. A retention test, administered 4 weeks after the posttest, indicated that concepts were retained. Prior knowledge was a significant predictor of posttest scores; gains in conceptual understanding are positively related to instructional emphasis; field-based programs in the sciences are effective in assisting students' understanding and retention of selected ecological concepts.

McDonald, J. and I.J. Hutchinson. 1986. Minority & ethnic variations in Outdoor Recreation. Pp. S 41-S 52 *in* A Literature Review, The President's Commission on Americans Outdoors.
Race among the major determinants of outdoor recreation behavior. Theories to explain differences in outdoor

participation: a) *socioeconomic demographic theory*, differences due to social class (as opposed to race); *theory of marginality*, under-participation due to racial discrimination and poverty, socioeconomic barriers of time, transportation, and money; *opportunity theory*, disparities in availability and accessibility of outdoor recreation resources, again, time and money; and *ethnicity perspective*, ascribes differences to subcultural leisure norms and values. Some trends: blacks participate more in sports; whites participate more in wildland outdoor; blacks recreate more locally; access to recreation facilities different for blacks and whites; blacks perceive greater barriers; rural background of southern born blacks may affect leisure; increased urbanization means increased convergence of black & white participation; recreation travel patterns differ. Need to understand relationship of demographics to opportunities, and on preferences. Future research might emphasize: inclusion of cross-cultural and regional comparison; identification of barriers; intra-group surveys; migration patterns of minorities w/in the US, and so on.

Marsh, H.W., and I.D. Smith 1982. Multitrait multimethod analyses of two self-concept instruments. Journal of Educational Psychology 74: 430-440.
Identity between-network and within-network studies of self-concept. B/n network show that self-concept is distinct from other variable; w/n network show distinct components that make up self-concept (e.g., physical, social, and academic self-concepts). Explored the multidimensionality of two commonly used measures of self-concept. Sears Self-Concept Inventory: 48 items measuring nine subscales; ratings on a 5 point scale. Coopersmith Self-Esteem Inventory: 66 items measuring four self-concept scales and a Lie scale; answers w/ either "like me" or "not like me"; contains positively and negatively worded items. MTMM analysis suggests that only a modest overlap in aspects that the two instruments are designed to measure. Sears SCI has one social s-c scale and four academic/intellectual scales that related to Coopersmith SEI: These two commonly used measures of self-concept do not measure the same construct. Factor analysis of the Sears SCI supported the scales w/in this instrument; subscales tended to be internally consistent and more highly related. Factor analysis of the Coopersmith SEI found the most consistent pattern to be a "negative item" factor defined by items that were worded in a negative direction; subscales tended to be less internally consistent and less correlated. "In fact, Coopersmith himself questioned the distinctiveness of the subscales of his instrument and concluded that self-concept -- at least for young children -- was not multidimensional.

Marsh, H.W., I.D. Smith, J. Barnes, and S. Butler. 1983. Self-concept: Reliability, dimensionality, validity and the measurement of change. Journal of Educational Psychology 75: 772-90.
According to Shavelson, self concept: individual's perception of self; formed through experience with the environment, interactions with significant others, and attributes of one's own behavior; self-concept becomes increasingly multifaceted as an adult approaches adulthood; both descriptive and evaluative (no distinction b/n concept and esteem). Authors devised a Self Description Questionnaire to measure self-concept based on Shavelson's model. Academic ability/performance is relatively uncorrelated with self-concept in nonacademic areas, substantially correlated with academic self-concept, and mostly correlated with measures that do not distinguish between academic and nonacademic self-concept. Measurement of change: difference scores are "notoriously unreliable, and this unreliability could preclude the demonstration of any systematic change in self-concept". Marsh et al. studied reliability of differences in each of seven areas of self-concept and three total scores. Internal consistency estimates were reasonably high. Little to no correlation between self-concept differences and differences in criterion measures, probably due to unreliability: implications are discouraging for relating changes in self-concept to other variables. Theoretically, self-concept incorporates all components of a person's life and thus unlikely that even dramatic change in a particular aspect of one's life will have a large effect on self-concept, and from the perspective of measurement theory, desirable that self-concept be relatively stable over time. This research found that a) self-concept *is* relatively stable; b) changes in self-concept were systematic and reliable; c) there is a clear, logical, and predictable ordering of self-concept factors (self-concept correlates with related variables and does not correlate with unrelated variables) ^ it is possible for a particularly dramatic change to have a substantial effect on some particular component of self-concept, even if it has a less substantial effect on overall self-concept. In contrast, changes in self-concept do not appear to be related to changes in other variables that are logically related to self-concept.

Marsh, H.W., G.E. Richards, and J. Barnes. 1986. Multidimensional self-concepts: the effect of participation in an Outward Bound program. Journal of Personality and Social Psychology 50: 195-204.
Systematic reviews of self-concept research emphasize the lack of theoretical basis in most studies, the poor quality of measurement instruments used to assess self-concept, and a general lack of consistent findings. Shore (1977) in a review of research on Outward Bound programs found that of the 80+ studies, none had a true experimental design, and few

systematically examined threats to the validity of interpretations based on pretest-posttest difference scores. Study by Smith, Gabriel, Schott, and Padia (1975) found that OB positively impacted self-assertion and self-esteem.

This study: participants completed Self-Description Questionnaire (SDQ) and the Rotter Locus of Control Scale (LOC). SDQ designed to measure self-concepts of preadolescents to young adults (3 versions); measures 13 scales with 8-point response. Rotter LOC: 23 question-pairs, using a forced choice format; each pair contains one internal statement and one external statement; total score = # external responses. Study supports OB as effective means of changing multiple dimensions of self concept and possibly of locus of control. Also supports validity and usefulness of SDQ. This is a really good article for methodology in measuring the psychological impacts of programs.

Marsh, H.W. and G.E. Richards. 1988. The Outward Bound bridging course for low achieving high school males: effect on academic achievement and multidimensional self-concepts. Australian Journal of Psychology 40:281-98.
Marsh, Richards, and Barnes (1986a; 1986b) found that participation in standard OB course had significant effect on the nonacademic dimensions of self-concept and produced a more internal locus of control. Change is more likely if individuals commit themselves to concrete realistic goals and keep records of progress towards the goals. When participants that come from same community share an intensive learning experience, they are more likely to reinforce changes once they return to old environment (McClelland 1965).

Marsh, H.W. and G.E. Richards. 1988. Tennessee Self-Concept Scale: Reliability, internal structure, and construct validity. Journal of Personality Social Psychology 55: 612-24.
Exploratory and confirmatory factor analyses and ANOVA to examine internal structure of TSCS responses. MTMM analyses to examine TSCS responses in relation to SDQ. Consistent support for the TSCS Family, Social and Physical scales but less consistent support for other TSCS scales, particularly Moral and Personal self scales. TSCS Scales correspond to the SDQIII scales: each has a family/parents scale; a social or same sex/opposite sex relational scale; a physical ability and appearance scale; a moral or scale; and a personal/general esteem scale. But in addition, the SDQIII has academic, math, verbal and problem solving scales, which the TSCS has no corresponding scale, except possibly certain components of the personal scale. Marsh and Richards found convergent and discriminant validity of responses to the TSCS and SDQIII; but found important anomalies in some TSCS scales. **One of interesting aspects of TSCS design is the theoretical role of satisfaction: satisfaction is the juxtaposition b/n accomplishments and the standards that one sets for oneself. Problems with this component of test that "render its interpretation dubious".

Mederick, F.W. 1977. Confronting Passive Behavior Through Outdoor Experience: A TA Approach to Experiential Learning. pp. 193-198 *in:* Children, nature and the urban environment: Proceedings of a symposium fair. USDA Forest Service General Technical Report NE-30. USDA Forest Service Northeastern Forest Experiment Station, Upper Darby, PA.
Transactional analysis used to facilitate personal growth, responsibility, and cooperative behavior.

Miles, John C. 1986. Wilderness as a learning place. JEE 18(2):33-41.
Discusses wilderness education in a historical perspective, including the development/difference b/n outdoor education and environmental education (which he describes as encompassing more issues related to pollution, energy, population, etc.) Suggests that wilderness education may uniquely, or more ably, contribute to humility, sense of wonder, and connectedness to nature; may help the learner's sense of personal, social, and natural history. Wilderness challenges the whole person: intellectual as well as physical, emotional, spiritual.

Noe, F.P. and R. Snow. 1989. Hispanic cultural influence on environmental concern. Journal of Environmental Education 21(2): 27-34.
Used New Environmental Paradigm scale (developed by Dunlap and Van Liere, 1979) in South Florida to determine whether differences in ethnic background influenced preferences toward environment. NEP scale used in a number of ethnic and cross-cultural studies; "best measure" for obtaining data on effects of ethnicity on environmental attitudes. Two surveys: field survey of registered boaters/park users and random telephone survey. Field survey found that Hispanic respondents believed in treating nature according to an ecological model and w/in a preservation ethic, but in general survey, Hispanic respondents did not. Both non-Hispanic groups showed an ecological orientation toward environment. Influences of Hispanic population w/ pro-NEP perspectives may be more social (from park/boating use) than cultural.

Outward Bound's impact on education. 1988. Third Outward Bound International Conference: Conference Proceedings: September 6-11, 1988, Cooperstown, NY.
This includes international meeting resolutions, such as a Mission Statement.
The most useful paper is by John Huie, former head of NCOBS. See copy.
Also, the closing remarks by John Raynolds sums up the conference.

Pfister, Robert E. 1993. Ethnic identity: A new avenue for understanding leisure and recreation preferences. Pp. 53-68 *in* A.W. Ewert, D.J. Chavez, and A.W. Magill (Eds.), Culture, Conflict, and Communication in the Wildland-Urban Interface. Boulder: Westview Press.
How to relate ethnic identity to culturally diverse leisure preferences. A good overview of the complexities and factors contributing to ethnicity (such as religion, language, cultural traditions linked to place of birth, ancestry, distinct group values, histories, symbols, also extent to which cultural features are salient, level of acculturation). **May be necessary to match the research design w/ the purpose of ethnic group comparisons.**

Rademacher, Craig. 1992. Science as adventure: Research futures in experiential education. Proceedings Manual, AEE 20th International Conference. October 8-11, 1992, Banff, Alberta, Canada.
A review of the Journal of Experiential Education with the intent of identifying important research articles. Since the beginning of publication in 1978, only about 6% of all JEE articles include a strong empirical basis. Almost 40% appear in the summer issue of 1987 (my review of this issue was that even this was poor). Some useful comments--research has become more focused on the "how" and "why" experiential education occurs, rather than "if." Future research must be multi-method. Experiential education is a complex and dynamic process. There is a need for improved interdependence between quantitative and qualitative research agendas.

Rentz, R.R. and W.F. White. 1967. Factors of self perception in the Tennessee Self Concept Scale. Perceptual and Motor Skills 24: 118.
Study to clarify the dimensions measured by TSCS. Evaluated 8 self esteem variables and self criticism, variability, certainty, and conflict.

Ross, David and B.L. Driver. 1986. Importance of appraising responses of subgroups in program evaluations: The Youth Conservation Corps. Journal of Environmental Education, 17(3): 16-23.
A sample of applicants to the 1979 YCC program were surveyed 26 months after camp to assess possible long-term perceived benefits to program participants. 1349 enrollees were surveyed and 510 unsuccessful applicants served as the control group. Also, parents were surveyed: 1160 parents of enrollees and 610 parents of unsuccessful applicants. Questionnaires were mailed out 9 months and again 26 months after the end of the program. Respondents were paid $3.00 for completing the questionnaire. The questionnaire contained two types of questions: those having to do with socio-economic and demographic characteristics and those with beneficial changes in the youths' knowledge, attitudes, skills and behaviors. See Table 1. The primary purpose here was to demonstrate empirically the importance of analyzing responses of very specific subgroups in program evaluations. Subgroups identified were by age, sex, income, race, population of residence.
The authors concluded that the small overall differences were practically significant. See Table 2.

Ross, David and B.L. Driver. 1988. Benefits of Residential and nonresidential youth summer camps. Journal of Outdoor Education 22:14-20.
The questions posed in this study was do residential camps provide greater or different types of benefits than nonresidential camps? In 1979 a 5-year longitudinal study was started to identify and assess possible long-term benefits of the YCC program. As part of the data analysis, the authors were able to compare the benefits realized by enrollees in residential and nonresidential camps. The research used mail questionnaires, with payment of $3.00 for completion. The youths scored themselves on 36 benefit scales by rating how much they agreed or disagreed (on a 7-point response format) with 121 statements related to specific, positive dimensions of their attitudes, skills, behavior, and environmental understanding. The overall response showed that residential camp participants reported statistically significant higher mean scores on 8 of the 15 selected benefit scales. However a close inspection reveals these differences are not large. See Table 1.

Sakofs, M.S., F. Hess, and D. Cornell. 1988. The Cooperstown-Outward Bound Summer Program: An informal look at the program's impact on the lives of students. Outward Bound USA, Greenwich, CT.
29 students. Pre/post/follow-up measures of Self Report Survey; academic records; parent questionnaire. Statistically significant effects in 5 of 7 subscales: self-confidence, sociability, self-deprecation, social pessimism, general well-being. No significance in measures of improved academic performance or attendance, but parents reported more positive behavior and attitude, specifically: 1) qualitatively more compassionate interactions b/n siblings, 2) assumption of more household responsibilities, 3) child's participation in community service projects. *Methodological note:* Self Report Survey was specifically designed to measure a variety of psychological factors associated with OB programs. 86 questions extracted from other validated/reliable instruments.

Scherl, Lea M. 1990. The Wilderness Experience: A Psychological Evaluation of its Components and Dynamics. pp. 11-22 *in:* A.T. Easley, J.F. Passineau, and B.L. Driver (compilers), The Use of Wilderness for Personal Growth, Therapy, and Education. USDA Forest Service, General Technical Report RM-193.
Most studies focus on change related to self (self-concept, self-esteem, self-satisfaction, self-awareness, etc.) but ignore individuals' affective states, perceptions and cognition associated with wilderness experience. Suggests that many studies lack the more descriptive, qualitative reports. Developed taxonomies of wilderness experience based on logbooks of participants of Adult Australian OB program. This article is interesting both for the taxonomy and the methodology. Less relevant in that this program did not focus at all on environment in terms of knowledge or awareness. Environment became most important in solo. Her data suggest that if the goal is to make people aware of the physical features of the environment, etc., then could perhaps be better achieved in situations where coping is *not* required, and perhaps in smaller groups (this group had 41 participants).

Schreyer, R., D.R. Williams, and L. Haggard. 1990. Episodic versus Continued Wilderness Participation ? Implications for Self-Concept Enhancement. pp. 23-26 *in:* A.T. Easley, J.F. Passineau, and B.L. Driver (compilers), The Use of Wilderness for Personal Growth, Therapy, and Education. USDA Forest Service, General Technical Report RM-193.
Most research has focused on single experiences and presumed benefits of self-concept. This study tries to elicit role of long-term participation in improving and *maintaining* self-concept. Two perspectives on self-concept: that it is stable, mostly unchanging; or that it is evolving, becoming. "while not unique in its ability to afford self-concept enhancement, wilderness possesses many attributes particularly well suited to the development of self concept", especially the presence of obstacles, challenge; opportunity for solitude, freedom from social forces, and enhanced ability to focus on self. Presumed benefits of programs, but questions regarding: 1) to what extent is self concept improved (as opposed to individual dimensions measured in scales); 2) is change long term; 3) are improvements real but temporary (i.e., they will disappear once individual returns home); 4) can episodic events really change self concept; 5) does change come from wilderness experience or social situation that accompanies it? (Does this matter? td) Interesting discussion of place of values in this: wilderness as a vehicle to abet a structured process is essentially value-neutral; paramilitary organizations and large corporations are using these experiences yet "the values of those who would commit warfare or engage in egregious exploitation of resources to maximize corporate gain appear to be anathema to fundamental meaning of wilderness...widens the gap b/n benefits of the process and the benefits of the wilderness..." Though many wilderness training programs incorporate wilderness values in instruction, no research shows that these values are actual source of self-concept improvement.

Two major dynamics in self-concept: maintenance/verification and enhancement. Maintenance: people seek interactions that affirm self-concepts. Long term wilderness experience provides maintenance/verification in 3 ways: a) opportunity structures, where individuals have choose activities that enhance one's one self concept and identity; b) symbols: values inherent in wilderness become a major source of self-concept expression, may be reinforced through long term participation (books, art, wilderness organizations, clothing can express wilderness self-concept); c) social interactions: norms of wilderness behavior used to affirm concepts of self. Self-concept enhancement: continued participation provides opportunity to chose desired directions, to change "opportunity structures" in order to change self; continued participation provides focused attachment to experience that offer personal i.d.

Scott, Neil R. 1974. Toward a Psychology of Wilderness Experience. Natural Resources Journal 14:231-237.
Outdoor recreation, such as backpacking, canoeing, nature study, and mountaineering offer opportunities for psychological growth. Asserts this through examples of Catlin, Muir, Eiseley, Leopold, Thoreau, and others had "peak

experiences" in wilderness. Peak experiences important for Maslow's self-actualization. (People who have achieve high levels of self actualization had frequent peak experience during which lasting cognitive changes were made.) Suggests testable hypotheses: wilderness experiences are more likely to foster self-actualization and the occurrence of peak experiences than outdoor activity in more degraded environments; peak experiences aid understanding of the environment; are those who choose wilderness activities more self-actualized than those who choose other outdoor recreation?

Conditions for cognitive change: egoless, self-forgetful state; disorientation to time and space; "fusion" w/ larger, more whole, subordinate unit detached from human usefulness, expedience, purpose; dichotomies/polarities/conflicts are fused, transcended or resolved, leading to new and creative insights; experience is self-validating and of intrinsic value.

Schulze, Joseph. 1971. An analysis of the impact of Outward Bound on twelve high schools. Report submitted to Outward Bound, Inc.
This report is based on information gathered throughout the school year 1970-1971. In each case, the author visited the school to be observed. He observed classes as well as Outward Bound programs. Discussions were held with administrators, teachers, students, parents and OB instructors. Evaluation reports were read. Questionnaires were sent to all participating schools. The author admits that much of the material for this report is subjective, however, he has been extremely cautious in attributing effects to OB programs and process. The schools selected reflect urban, suburban and rural constituents and they include boarding and day, public and private. The report looked at the impact on teachers, students (personal values, individual initiative, maturity, increased sense of potential and accomplishment, sense of self-worth, made academic aspects of school more relevant, worked more as a unit), and curriculum.

Shafer, Elwood and James Mietz. 1969. Aesthetic and emotional experiences rate high with northeast wilderness hikers. Environment and Behavior. 1(2): 187-197.
This study explored the possibility of quantifying by means of an attitude scale, a few preselected qualitative values of wilderness reaction. Five phrases that described what an individual may enjoy most about wilderness recreation were used: aesthetic, emotional, physical educational and social. The study used 76 wilderness hikers in the White Mountains and Adirondacks. In both cases, the aesthetic and emotional experiences were the most important wilderness-recreation values.

Shavelson, R., J.J. Hubner, and G.C. Stanton. 1976. Self-concept: Validation of construct interpretations. Review of Educational Research 46: 407-41.
Cites some empirical evidence to support link b/n self-concept and achievement. Taken individually, studies may provide important insights into the factors that motivate students, but self-concept measurements may not be valid: 1) definitions of self-concept imprecise; (2) equivalent data not available b/n studies; (3) data not available to test counter-interpretations. Following this introduction are attempts to provide ways of filling these pit-falls in the methodology. Comprehensive definitions of self-concept, of interpreting test scores, and a review of the five major self-concept instruments are included. Interestingly, he does not include the TSCS. This will be one to turn to again for specifics in methodology.

Shepard, C.L. and L.R. Speelman. 1985. Affecting Environmental Attitudes Through Outdoor Education. JEE 17(2): 20-23.
Study of whether participation in 4-H camp with outdoor education program had any measurable impact on environmental attitudes. Positive learning experience but little effect upon environmental attitudes. Possible relationships suggested by t-test analysis temper this conclusion a bit. Program length, area of residence (urban/rural), and previous similar experiences may influence attitudinal changes.

Used a Likert-type survey instrument for assessing environmental attitudes, also collected demographic information, such as previous camping experiences, urban or rural area of residence, county of residence, and data categorization questions. Instruments adapted from: "The Cognitive and Affective Evaluation Instruments" developed by the Willoughby-Eastlake City Schools (1975), "The Student Attitudinal Measure" developed by J.J. Huckestein (1976), "Some Ideas I have" developed by A.M Voelker and R.E. Horvat (1974), "The Toledo Outdoor Education Program Pupil Questionnaire" developed by S.A. Fletcher (1973), "Survey on Wildlife Attitudes" developed by S. Zipko (1978), and "Evaluation: Nature's Hitchhikers" developed by D.L. Bainer (1982).

Although the experimental treatment had little statistical effect upon environmental attitudes, program length, previous camp experience, camper age, and area of residence seem to be important correlates of environmental attitude development.

Smith-Sebasto, N.J. 1995. The effects of an environmental studies course on selected variables related to environmentally responsible behavior. JEE 26(4): 30-34.
Used Environmental Action Internal Control inventory (EAICI), the Index of Environmental Action Knowledge and Skill (IEAKS) and the Environmentally Responsible Behavior Inventory (ERBI) to measure locus of control for environmentally responsible behavior (ERB). Students completing an environmental studies course had a more internal locus of control for erb and more frequent performance of erb's but had lower perception of their knowledge and skills for erb. [in this way, the exp. ed. programs would probably have an advantage in that skills are being learned.]

Stankey, G.H. and R. Schreyer. 1987. Attitudes Toward Wilderness and Factors Affecting Visitor Behavior: A State-of-Knowledge Review. In R.C. Lucas (ed.), Proceedings of the National Wilderness Research Conference. Ft. Collins, CO: USDA Forest Service General Technical Report INT-220, pp. 294-319. Factors affecting visitor behavior: 1) Role of Education in Influencing Behavior; 2) Social Influences; 3) Evolution in Behavior. Most useful for its literature citations.

Talbot, Janet and Stephen Kaplan. 1986. Perspectives on wilderness: Re-examining the value of extended wilderness experiences. Journal of Environmental Psychology, 6(3): 177-188.
This paper reports on the final phase of a 10-year research program dealing with the dynamics and impacts of wilderness experiences: specifically with the Outdoor Challenge Program in Michigan's Upper Peninsula. The study examines 129 participants between 1972 and 1979 who wrote daily journals, and filled out brief questionnaires both during the trips and 6 months afterwards. Participants were recruited from a variety of backpacking experience. The Outdoor Challenge Program in its early years was similar to the OB model but later centered more on the natural environment. Four open-ended items were included in a set of questionnaires filled out immediately before returning home: describe the best, the worst, the hardest things about the trip and how they felt they were changed, if at all, by this experience. See Table 1. When asked if they felt these experiences had changed them, many participants reflected a sense that they wanted to live life more simply and slowly in the future. Many felt a more compelling interest in the world of nature and felt they would be more considerate of family and friends. They also wanted to make decisions about their lives which reflected their own priorities. Longer/shorter trips, adult/teenager, male/female participants were compared. The date reveals an increased sensitivity to nature, and positive changes in individual ratings of self-confidence, psychological energy and general well-being. Journals were also analyzed. Table 2 shows the comparisons in perceptual responses to wilderness. Also of particular interest was the feelings of control over the environment; more participants said they were feeling more at one with or part of their environment. See Table 3. The evidence presented here suggests that the wilderness environment is one where the experience of compatibility, the harmonizing of one's own capabilities and inclinations, is likely. Also, participants indicated that their orientations to life have been affected by these experiences: they see their lives as being different from before--less cluttered, more mindful of those to whom they are close and more focused on what they personally consider valuable.

Vogl, R.L. and Vogl, S. 1990. The effectiveness of wilderness education: A review and evaluation. pp. 157-164 *in*: A.T. Easley, J.F. Passineau, and B.L. Driver (compilers), The Use of Wilderness for Personal Growth, Therapy, and Education. USDA Forest Service, General Technical Report RM-193.
Reviewed 24 dissertations dealing with wilderness education programs. Over 60% of studies indicated that program possibly impacted self-concept and improved social relations, but had little impact on wilderness ethic, philosophy of life or environmental attitudes.

Washburne, R. and P. Wall. 1980. Black-White Ethnic Differences in Outdoor Recreation. USDA Forest Service Research Paper INT-249.
Study of outdoor participation found that blacks' lower rates of participation in wildland settings related to inhibitory factors or population composition, but rather from distinct cultural values and normative systems, different from white "mass society". Found no significant difference in urban recreation, such as tennis, picnicking, sunbathing, swimming, nor for fishing, nature walks, horseback riding, off-road driving. Significant differences, however, in activities associated

w/ wildland settings: camping, water and snow skiing, boating, hiking, backpacking, hunting, sightseeing (of natural areas). Lack of transportation only reported barrier for black participation. Though blacks did travel somewhat less than whites, they are still willing/able to do so, especially for certain activities. Question remains whether *location* or *activity itself* is determining black leisure.

Williams, Daniel, Lois Haggard and Richard Schreyer. 1988. The role of wilderness in human development. General Technical Report SE-51. USFS.
This paper focuses on the human development functions of wilderness as the result of individuals actively seeking self-definition. Wilderness is a rich a potent source of personal, national/cultural and biological identity information. The authors differentiate between self-definition and self-esteem. They conclude there is a tremendous need to articulate the relevance of the types of benefits to our culture as well as to generate reliable, useful and systematic data on the actual benefits provided by wilderness. I recommend reading the entire article.

Wylie, R.C. 1979. The self concept (vol. 2). Lincoln, Nebr: University of Nebraska Press.
Presents an overview and discussion of 10 self-concept scales. Most relevant to this research are the Rosenberg Self-Esteem Scale, the Rosenberg-Simmons Self-Esteem Scale, and the three Self-Description Questionnaires (I-III) developed by Marsh et al.

Young, R.A. and Crandall, R. 1984. Wilderness Use and Self-Actualization. Journal of Leisure Research 16(2):149-160.
This study provided empirical tests of the prediction that wilderness users are more self-actualized than non-users and that frequent wilderness users are more self-actualized than occasional users.

Definition of self-actualization:
Maslow (1970) developed idea of self-actualized person as more fully functioning, more enriched life than average: more accepting of self, of others, of natural processes; more spontaneous and natural; liking solitude and privacy more than the avg. person; more independent of their physical & cultural env.; more appreciative of the basic goods of life; more likely to experience the acute mystic or peak experience; more likely to possess a special king of creativeness, originality, or inventiveness; more philosophical, unhostile sense of humor. Shostrom (1974) added: high self-esteem; inner direction; living in present; acceptance of weakness; spontaneity. Rossman and Ulehla (1977): encountering opinions that enlarge the spirit of man; finding chances for personal growth; feeling a part of the life cycle; enhancing one's self-identity.

Relation of self-actualization to wilderness:
Goble (1970) asserted that beauty in the environment promotes well-being and that this well-being enhances self-image, which is an important part of self-actualization.

Kaplan (1974): individuals choosing an Outdoor Challenge program using a "wilderness" experience scored significantly higher on the Rosenberg Self-Esteem measure than a control group.

Measuring self-actualization:
* Rosenberg Self-Esteem measure (in Kaplan 1974)
* Personal Orientation Inventory (in Shostrom 1974; adapted in Young and Crandall 1984): "the most validated measure of self-actualization".
* "Wilderness Purism" (in Stankey 1972), measure of willingness to protect wilderness areas.

Findings:
Results concur with what Scott (1974) had asserted -- that wilderness users as a group are more self-actualized than non-users. Also found a trend that potential users have higher self-actualization than potential non-users (those who would not seek wilderness experience). Among BWCAW users, those who use wilderness most are not more self-actualized than less frequent users. Significant but minor correlation b/n self-actualization and a positive general wilderness attitude and b/n self-actualization and wilderness purism.

Young and Crandall (this study) suggest that although positive correlations were found between self-actualization and

wilderness use/attitudes, this was only very slight. Motivation of wilderness users could be probed in greater depth and then related to self-actualization. Suggest that it is the specific meaning of wilderness activity, rather than general participation, that relates to self-actualization.

Young, A.B. and T.W. Steele. 1990. The Effects of Pretesting and Degree of Adventure on Self-concept. pp. 27-34 *in:* A.T. Easley, J.F. Passineau, and B.L. Driver (compilers), The Use of Wilderness for Personal Growth, Therapy, and Education. USDA Forest Service, General Technical Report RM-193.
Weaknesses in self-concept/OB/adv. ed. studies: 1) one-group designs; one group, pretest, posttest design; 2) control and subject groups are usually not equivalent. Treatment group usually self-selected, control usually not; "educational research ought to compare alternate forms of treatment rather than some instruction or no instruction"; 3) neither through design nor statistical analysis are pretest effects measured; 4) few studies have attempted to identify the components that affect outcomes, and as a result, little is known about effective ingredients for designing an effective program and it is not clear to what degree an outdoor program needs to fit an adventure-education (challenges) to achieve significant changes in self-concept.

Hypotheses of this study: 1) in conjunction w/ a treatment, exposure to TSCS as a pretest affects posttest TSCS scores; 2) subjects exposed to ropes component of a program will have higher TSCS than subjects who do not; 3) an outdoor education program not rooted in o.e. model will effect significant changes in self-concept. Used Tennessee Self Concept Scale. Because 10 subscales are intercorrelated, only its Total Positive overall self-esteem score was used in this analysis. Results: 1) found no significant differences between mean of pretested and not pretested subjects; TSCS pretests need not be given to achieve results and do not bias results; 2) ropes training is not critical to self-concept change; and 3) adventure education need not be the primary aim or model to achieve positive gains in self-concept (don't need to be as dramatic as OB); this study did not reveal *why* change occurred.

Zuckerman, M, R.N. Bone, R. Neary, D. Mangelsdorff, and B. Brustman. 1972. What is the sensation seeker? Personality trait and experience correlates of the sensation-seeking scales. Journal of Consulting and Clinical Psychology 39: 308-321.
Assumption that optimal levels of stimulation are basic personality dimensions (different for each individual) and are not adequately measured by existing tests. Developed SSS (Sensation Seeking Scale) with factors to measure: a) thrill and adventure seeking, such as outdoor sports, involving elements of danger or speed; b) experience seeking: need for a broad variety of experience; c) disinhibition: hedonistic, extraverted philosophy; and d) boredom susceptibility: dislike of repetition. Some factors correlated with scales of the MMPI and the 16 PF. Probably only useful if we wanted to look at the reasons for participation.

APPENDIX B:

OUTLINE OF CRITICAL RESEARCH VARIABLES

I. Environmental Awareness, knowledge, ethic

A. Relationships with Nature

appreciation of nature; stewardship;

discovering smells, sights, sounds of nature;

living in harmony with nature;

sense of wholeness; awe of nature.

B. Environmental Ethic/Attitudes

awareness of environment;

understanding of conservation;

environmentally responsible behavior;

C. Knowledge

awareness of conservation issues;

awareness of resource management practices;

II. Self esteem

A. Self-satisfaction

B. Autonomy, self-sufficiency;

C. Risk Taking

D. Perseverance

E. Coping with stress

F. Skills

outdoor skills; problem solving skills;

cognitive skills; conflict resolution skills;

group and leadership skills;

G. Physical fitness

III. Orientation To Life

A. Restoration, inner peace

B. Personal Values

C. Nature-oriented activities

D. Future environmental goals

IV. Social Relations

A. Working with others; forming friendships; teamwork; leadership skills; initiative/assertiveness

B. Relationships with Adults

C. Respect for others/Caring for others/Sensitivity

D. Functioning at school

E. Responsibility; dependability; seeing tasks to completion; organization; efficiency;

V. Critical Thinking/Problem-solving

skills; coping; adaptation; conflict-resolution; stress handling and reduction; creativity and imagination; cognitive development;

VI. Service

environmental service; community service; philanthropy

APPENDIX C:

RETROSPECTIVE AND LONGITUDINAL STUDY SURVEYS

We are researchers at the Yale University School of Forestry and Environmental Studies interested in learning about the effects of environmental education which occurs in the outdoors. We are particularly interested in programs where participants spend at least three or more weeks in wilderness areas. We are specifically concerned with learning from those who have participated in programs of the Student Conservation Association, National Outdoor Leadership School, and Outward Bound.

This study is funded by the National Fish and Wildlife and R.K. Mellon Foundations. All responses will be kept strictly confidential, and at no time will the names of individual respondents be used when reporting the results of this investigation. Our interest is scientific and educational. The results of this investigation will hopefully improve the quality of outdoor environmental education programs. Your participation will greatly assist in this effort.

We would first like to ask you some preliminary questions which will determine if it is appropriate for you to participate in this study.

1. Have you participated in programs offered by the Student Conservation Association, the National Outdoor Leadership School, or Outward Bound?

Yes ___ No ___

2. Did any of these programs require approximately three weeks in a wilderness area?

Yes ___ No ___

3. Have you participated in programs in more than one of these organizations?

Yes ___ No ___

4. Have you participated in three or more programs in *the same* organization?

Yes ___ No ___

If you answered **no to questions 1 or 2, or yes to questions 3 or 4**, unfortunately, it would not be appropriate for you to participate in this research. Thank you for your interest.

If you answered **yes to question 1** (you participated in no more than two programs of either the Student Conservation Association, National Outdoor Leadership School, or Outward Bound), **and yes to question 2** (this program required approximately three weeks in a wilderness type area), **please continue to answer the following questions.** If you participated in two programs of the same organization, please respond to the extent possible, based on your experience in the first program you participated in.

5. Which organization's program did you participate in?

___ **Student Conservation Association**

A. Did you participate in the
High School ___,
College Resource Assistant___, or
Conservation Career Development Program___?

B. If you participated in the College Resource Assistant Program, was all of your time spent working in an outdoor/wilderness setting?
Yes ___ No ___

C. Did you spend any of your time working in a lab, visitor center, or office?
Yes ___ No ___

If you answered **no to B or yes to C** (you did not spend all your time in an outdoor setting), then we are sorry, but it would not be appropriate for you to participate in this study.

D. If you did answer spend all your time outdoors, how long was the program?

E. Where did the program occur?

F. How old were you at the time of your participation in the program?

G. How much wilderness experience did you have prior to participating in the program?
1) A great deal; 2) some; 3) not much; 4) none

___ **National Outdoor Leadership School**

What type of program?
How long was the program?
Where did the program occur?
How old were you at the time of your participation in the program?
How much wilderness experience did you have prior to participating in the program?
1) A great deal; 2) some; 3) not much; 4) none

___ **Outward Bound**

What type of program?
How long was the program?
Where did the program occur?
How old were you at the time of your participation in the program?
How much wilderness experience did you have prior to participating in the program?
1) A great deal; 2) some; 3) not much; 4) none

6. Please indicate how important the reasons listed below were in choosing to participate in this program. (*Circle one number for each statement.*)

	Very Important	Moderately Important	Not Very Important	Not at all Important	No opinion	Not applicable
Experience or training useful in my *personal* development	1	2	3	4	5	6
Experience or training useful in my *career* development	1	2	3	4	5	6
Adventure and challenge in the outdoors	1	2	3	4	5	6
Getting away from my usual surroundings	1	2	3	4	5	6
Contributing work that benefits others	1	2	3	4	5	6
Learning *how* to conserve and protect the environment	1	2	3	4	5	6
Learning *about* the environment	1	2	3	4	5	6
Increasing my physical fitness (e.g., strength, stamina, coordination)	1	2	3	4	5	6
My family wanted me to participate	1	2	3	4	5	6
Being in the wilderness	1	2	3	4	5	6
Acquiring outdoor skills	1	2	3	4	5	6
Learning leadership skills	1	2	3	4	5	6
Learning to work with other people	1	2	3	4	5	6
My friends urged me to participate	1	2	3	4	5	6
Clarifying my values	1	2	3	4	5	6
Improving my thinking and problem-solving abilities	1	2	3	4	5	6
Learning to survive in the wild	1	2	3	4	5	6
Other (please specify) _____	1	2	3	4	5	6

7. Would you say your overall program experience was (*Circle one number*):

1 one of the best in your life
2 very good
3 moderately good
4 not very good
5 you would never do it again
6 no opinion

8. **In comparison with other experiences** you have had, please rate the relative worth of this program with regard to the areas listed below. (*Circle one number for each area.*)

	Very Worthwhile	Moderately Worthwhile	Not very Worthwhile	Not at all Worthwhile	No opinion	Not applicable
Overall Impact	1	2	3	4	5	6
Interest in the Environment	1	2	3	4	5	6
Personal Development (e.g., maturity, independence, self-esteem)	1	2	3	4	5	6
Intellectual Development (e.g., problem-solving, initiative, critical-thinking)	1	2	3	4	5	6
Career Choice	1	2	3	4	5	6
Outdoor Recreational Interests (e.g., hiking, camping, birding, fishing)	1	2	3	4	5	6
Interest in Community Service (e.g., volunteer activities, social service, philanthropy)	1	2	3	4	5	6
Other (please specify) _____	1	2	3	4	5	6

9. Please indicate your **current level of interest** in the following outdoor experiences. (*Circle one number for each area.*)

	Very Interested	Moderately Interested	Somewhat Interested	Little Interest	Not at all Interested	No opinion
Camping and hiking in the outdoors	1	2	3	4	5	6
Seeing attractive scenery	1	2	3	4	5	6
Pursuing challenging activities like climbing mountains, running rivers, etc.	1	2	3	4	5	6
Being spiritually inspired by nature.	1	2	3	4	5	6
Scientifically studying nature, such as biological or geological studies.	1	2	3	4	5	6
Pursuing outdoor hobbies, such as birdwatching, butterfly collecting, etc.	1	2	3	4	5	6
Pursuing practical activities in the outdoors, such as gathering firewood, collecting wild foods, etc.	1	2	3	4	5	6

	Very Interested	Moderately Interested	Somewhat Interested	Little Interest	Not at all Interested	No opinion
Seeing wild animals, such as deer, eagles, raccoons, etc.	1	2	3	4	5	6
Hunting or fishing	1	2	3	4	5	6
Visiting areas important in the country's history, such as Mt. Rushmore, historic battlefields, etc.	1	2	3	4	5	6
Testing your survival skills in the wild.	1	2	3	4	5	6
Other (please specify) _____	1	2	3	4	5	6

10. The following statements concern your general opinions about the environment, **independent of your participation in the program.** There are no right and wrong answers. If you have difficulty answering a question, please give your general or first impression. (*Circle one number for each statement.*)

	Strongly Agree	Agree	Disagree	Strongly Disagree	No opinion
I am **not** in favor of saving remote wilderness that most people will rarely have a chance to see.	1	2	3	4	5
I think we need to develop oil resources in places like the Arctic National Wildlife Refuge.	1	2	3	4	5
Preserving wild areas for scientific study is far less important today because we know so much more about how nature works.	1	2	3	4	5
Spending time in the wilderness is important for my psychological well-being.	1	2	3	4	5
I see little reason to preserve the forest habitat of a relatively unknown and useless endangered species if it results in less timber cut and higher lumber prices.	1	2	3	4	5
If I knew someone who had cancer that could be treated by using a rare plant or animal, I would sacrifice the species to treat that person.	1	2	3	4	5
If the choice was between preserving a swamp or filling it to build a factory that could provide jobs for poor people, I would choose to fill the wetland.	1	2	3	4	5
Spending more than a day or two in the wilderness makes me nervous.	1	2	3	4	5
I do **not** feel much spiritual connection with nature.	1	2	3	4	5
I would be afraid to be caught in a storm if I were camping in the wild.	1	2	3	4	5

	Strongly Agree	Agree	Disagree	Strongly Disagree	No opinion
I think love is an emotion people should have for other people, not for nature.	1	2	3	4	5
I am more interested in individual animals than in ecological relationships among species.	1	2	3	4	5
When camping, I prefer to stay in a modern campground than in an isolated wilderness area.	1	2	3	4	5
Animals like grizzly bears and bighorn sheep should be protected even if some people have to make economic sacrifices.	1	2	3	4	5
I think it is nice to have beautiful animals like mute swans in the wild even if they are not originally native to the United States.	1	2	3	4	5
I have little desire to hike a long way into wild country just to see some mountain or canyon.	1	2	3	4	5
I think undesirable plants and animals like mosquitoes and poison ivy should be eliminated.	1	2	3	4	5
I am fascinated by the taxonomic differences among plants and animals.	1	2	3	4	5
Watching birds as a hobby strikes me as a waste of time.	1	2	3	4	5
I very much enjoy participating in scientific discussions of nature.	1	2	3	4	5

11. Please check which activity you most prefer in each of the following groups. If you would not want to participate in any of the listed activities, mark none.

A. Fish in a stream___; White water kayak ___; Participate in a river clean-up___; None___

B. Read legends about bears___; See a bear in the wild___; Watch t.v. programs about bears___; None___

C. Have an animal as a pet___; See animals in the zoo___; See animals in the wild___; None___

D. Study ecology___; Hunt or fish___; Photograph nature___; None___

E. Listen for owls at night___; Help conserve owls___; Read stories about owls___; None___

F. Restore animal habitat___; Help conserve a national symbol like the bald eagle___; Participate in scientific studies of wildlife___; None___

G. Paint a picture of a pine forest___; Make pine furniture___; Scientifically study pine forests___; None___

H. Spend a night in a campground___; Camp in a wilderness area___; Stay in a hotel near a wilderness area___; None___

I. Climb to the top of a mountain___; See a mountain___; Build a house on a mountain___; None___

12. Please indicate how serious you regard the following environmental problems in the United States today. (*Circle one number for each issue.*)

	Very serious	Moderately serious	Somewhat serious	Not very serious	Not at all serious	No opinion
Loss of open space and recreation lands	1	2	3	4	5	6
Human population growth	1	2	3	4	5	6
Water pollution	1	2	3	4	5	6
Species endangerment and extinction	1	2	3	4	5	6
Excessive use of national parks	1	2	3	4	5	6
Excessive litter and trash	1	2	3	4	5	6
Air pollution	1	2	3	4	5	6
Destruction of plant and animal habitat	1	2	3	4	5	6
Loss of biological diversity	1	2	3	4	5	6
Declining quality of the urban environment	1	2	3	4	5	6

13. How much did participating in the program influence your concern and/or awareness of these issues? (*Circle one number for each issue.*)

	A great deal	Some	Not very much	Not at all	No opinion	Not applicable
Loss of open space and recreation lands	1	2	3	4	5	6
Human population growth	1	2	3	4	5	6
Water pollution	1	2	3	4	5	6
Species endangerment and extinction	1	2	3	4	5	6
Excessive use of national parks	1	2	3	4	5	6
Excessive litter and trash	1	2	3	4	5	6
Air pollution	1	2	3	4	5	6
Destruction of plant and animal habitat	1	2	3	4	5	6
Loss of biological diversity	1	2	3	4	5	6
Declining quality of the urban environment	1	2	3	4	5	6

14. Prior to being in the program, how often did you participate in any of the following activities? (*Circle one number for each action.*)

	A great deal	A Moderate Amount	Occasionally	Rarely	Never
Writing letters to government officials about the environment	1	2	3	4	5
Working with citizen groups about the environment	1	2	3	4	5
Donating money to organizations concerned with the environment	1	2	3	4	5
Volunteering with organizations concerned with the environment	1	2	3	4	5
Participating in environmental protests, such as demonstrating or picketing	1	2	3	4	5
Avoiding the use or purchase of certain products because of their environmental impact	1	2	3	4	5
Recycling products at home	1	2	3	4	5
Using public transportation	1	2	3	4	5
Taking courses about the environment	1	2	3	4	5
Reading about the environment	1	2	3	4	5
Attending meetings at school or in the community about the environment.	1	2	3	4	5
Other (please specify) _____	1	2	3	4	5

15. Since being in the program, how often have you participated in the following activities? (*Circle one number for each action.*)

	A great deal	A Moderate Amount	Occasionally	Rarely	Never
Writing letters to government officials about the environment	1	2	3	4	5
Working with citizen groups about the environment	1	2	3	4	5
Donating money to organizations concerned with the environment	1	2	3	4	5
Volunteering with organizations concerned with the environment	1	2	3	4	5
Participating in environmental protests, such as demonstrating or picketing	1	2	3	4	5
Avoiding the use or purchase of certain products because of their environmental impact	1	2	3	4	5
Recycling products at home	1	2	3	4	5

	A great deal	A Moderate Amount	Occasionally	Rarely	Never
Using public transportation	1	2	3	4	5
Taking courses about the environment	1	2	3	4	5
Reading about the environment	1	2	3	4	5
Attending meetings at school or in the community about the environment.	1	2	3	4	5
Other (please specify) _____	1	2	3	4	5

16. Please name any conservation or environmental organizations you were a member of prior to participating in the program.

17. Please name any conservation or environmental organizations you were a member of since participating in the program.

---

18. **The following questions concern possible impacts that may have resulted *from participation in your program.*** We realize some of these impacts may have resulted from experiences other than those in the program. However, we are only interested in whether or not, in your opinion, these impacts resulted because of your program experience. (*Circle one number for each statement.*)

	Strongly Agree	Agree	Disagree	Strongly Disagree	No opinion
Because of the program, I am now more convinced that human ingenuity will find solutions to most of our environmental problems.	1	2	3	4	5
Because of the program, I have a greater sense of humility towards the environment.	1	2	3	4	5
Because of the program, I feel more spiritually connected with nature.	1	2	3	4	5
Because of the program, I realize how much I enjoy taking care of myself in the wild.	1	2	3	4	5
Because of the program, I realize how much I like to recreate in the outdoors.	1	2	3	4	5
Because of the program, I no longer view nature as being as complex as I once thought.	1	2	3	4	5
Because of the program, I have a much stronger interest in ecology.	1	2	3	4	5

	Strongly Agree	Agree	Disagree	Strongly Disagree	No opinion
Because of the program, I am much more aware of how frightening and dangerous the wilderness can be.	1	2	3	4	5
Because of the program, I discovered my ability to be resourceful and self-reliant.	1	2	3	4	5
Because of the program, I now like to test my physical abilities in rough and challenging terrain.	1	2	3	4	5
Because of the program, I have learned new skills which I now use whenever I get a chance.	1	2	3	4	5
Because of the program, I realize I am not very comfortable living in primitive conditions.	1	2	3	4	5
Because of the program, I have tried to cut down on the amount of litter and waste I generate.	1	2	3	4	5
Because of the program, I participate more in organizations concerned with protecting the environment.	1	2	3	4	5

19. How much do you think your program experience changed any of the following attitudes toward the environment? (*Circle one number for each statement.*)

	A great deal	A Moderate Amount	Somewhat	Not very Much	No opinion
Because of the program, I am now more aware of the sights, sounds, and smells of nature.	1	2	3	4	5
Because of the program, I have a greater feeling of awe for nature.	1	2	3	4	5
Because of the program, I feel in greater harmony with nature.	1	2	3	4	5
Because of the program, I have a greater aesthetic appreciation for nature.	1	2	3	4	5
Because of the program, I feel more responsible for conserving and protecting nature.	1	2	3	4	5
Because of the program, I have a greater respect for nature.	1	2	3	4	5
Because of the program, I am more willing to sacrifice economic gain in order to protect nature.	1	2	3	4	5

The following questions concern your general **knowledge of the environment.** Please do not be concerned if you cannot answer many of these questions. Very few people can.

Please circle the correct answer.

20. The phrase "carrying capacity" means:

a) the ability to transport goods;
b) the weight of varying vessels in the ocean;
c) the volume of different gases in the atmosphere;
d) the limits to a species' population growth in the environment;
e) all of the above.

21. The most frequent reason today for plant and animal extinctions is:

a) human hunting for food and recreation;
b) the inability of species to compete;
c) the destruction of natural habitat;
d) the introduction of nonnative species.

22. Erosion can result from which of the following:

a) clearcutting forests on steep slopes;
b) not planting after an area has been used to grow agricultural crops;
c) roadbuilding along the ridges of steep hills and mountains;
d) overgrazing by cattle and sheep;
e) all of the above.

23. Which of the following can regulate the population size of a species:

a) predators;
b) disease;
c) environmental change;
d) all of the above.

24. The ecological role of a fungus is:

a) decomposition and release of nutrients back into the environment;
b) warning that an ecosystem is being degraded;
c) replenishing aquifers;
d) photosynthesizing food for other organisms.

25. The term "resource depletion" generally refers to:

a) a decreasing amount of natural resources;
b) an increasing availability of natural resources;
c) producing more natural resources;
d) using fewer natural resources.

26. Multiple use means:

a) raising various crops in an area;
b) the abundance and distribution of species in an ecosystem;
c) managing land for various purposes;
d) creating a stable, self-sustaining environment.

27. Sustained yield is generally defined as:

a) harvesting immature individuals of a species;
b) creating a range of chemical and physical conditions for a species' survival;
c) a species' ecological niche;
d) the rate a resource can be exploited without reducing its supply over time.

28. Current controversy over public lands concerns:

a) grazing fees;
b) drilling for oil on federal government lands and waters;
c) farming on marginal lands;
d) a & b only;
e) a, b, and c.

29. When too much fertilizer or sewage is added to a lake, the effect is called:

a) overflow;
b) edaphic;
c) acceleration;
d) eutrophication.

30. Earthworms are beneficial in which of the following ways:

a) decomposing leaves;
b) increasing the amount of organic matter in the soil;
c) loosening soil particles;
d) providing food for birds and small mammals;
e) all of the above.

31. Biodiversity generally refers to:

a) different types of plant and animal species;
b) the different ways species interact with each other;
c) breeds of domestic animals;
d) all of the above;
e) none of the above.

32. There are more species of which type of animal:

a) fish;
b) mammal;
c) insect;
d) bird.

33. The roots of forest plants help to:

a) break soil down;
b) hold soil together;
c) increase infiltration of water into soil;
d) a and b;
e) a, b, and c;
f) none of the above

34. Please indicate how much you think the following sources of information have increased your **understanding of the natural environment.** (*Circle one number for each source.*)

	Very much	A Moderate amount	A Little	Not at all	No opinion	Not applicable
High school	1	2	3	4	5	6
College	1	2	3	4	5	6
Outdoor recreation activities	1	2	3	4	5	6
Participation in this program	1	2	3	4	5	6
Informal discussions with friends	1	2	3	4	5	6
Informal discussions with family	1	2	3	4	5	6
Watching television	1	2	3	4	5	6
Reading books and magazines	1	2	3	4	5	6
Other (please specify) _____	1	2	3	4	5	6

35. There are various ways your program may have increased your understanding of the natural environment. Please indicate how much any of the following possible program experiences increased your understanding of the natural environment. (*Circle one number for each experience.*)

	Very much	A Moderate amount	A Little	Not at all	No opinion	Not applicable
Natural history study (plant and animal identification, collecting, etc.)	1	2	3	4	5	6
Research and scientific study	1	2	3	4	5	6
Lectures and demonstrations	1	2	3	4	5	6
Informal discussions	1	2	3	4	5	6
Assigned reading	1	2	3	4	5	6
Field trips	1	2	3	4	5	6
Resource conservation activities	1	2	3	4	5	6
Environmental restoration activities	1	2	3	4	5	6
Trail building activities	1	2	3	4	5	6
Wilderness survival activities	1	2	3	4	5	6
Map reading and orienteering in the wild	1	2	3	4	5	6
Outdoor adventure activities (e.g., mountain and rock climbing, canoeing and kayaking, etc.)	1	2	3	4	5	6
Hunting and/or fishing	1	2	3	4	5	6
Birding and other wildlife observation activities	1	2	3	4	5	6
Other (please specify) _____	1	2	3	4	5	6

36. Please indicate how much you think your program increased your knowledge of the natural environment in the areas listed below. (*Circle one number for each area.*)

	Very much	A Moderate amount	A Little	Not at all	No opinion	Not applicable
General awareness of the natural environment	1	2	3	4	5	6
Ability to identify various plants and animals	1	2	3	4	5	6
Knowledge of geology and geography	1	2	3	4	5	6
Knowledge of ecology	1	2	3	4	5	6
Knowledge of human impacts on the environment	1	2	3	4	5	6
Knowledge of conservation	1	2	3	4	5	6
Knowledge of wildlife	1	2	3	4	5	6
Knowledge of botany and forestry	1	2	3	4	5	6
Knowledge of hydrology	1	2	3	4	5	6
Knowledge of weather and climate	1	2	3	4	5	6
Knowledge of government agencies that administer laws concerning the natural environment	1	2	3	4	5	6
Knowledge of interest groups concerned with the environment	1	2	3	4	5	6
Knowledge of past and present land use	1	2	3	4	5	6
Knowledge of environmental justice issues and problems	1	2	3	4	5	6
Other (please specify)_____	1	2	3	4	5	6

37. Prior to being in the program, approximately how often did you participate in the activities listed below. (*Circle one number for each activity.*)

	A great deal	A Moderate Amount	Occasionally	Rarely	Never
Backpacking and/or camping	1	2	3	4	5
Hunting	1	2	3	4	5
Fishing	1	2	3	4	5
Scientific study of nature	1	2	3	4	5
Birding and other wildlife observation	1	2	3	4	5
Skiing	1	2	3	4	5
Canoeing, kayaking, and/or rafting	1	2	3	4	5
Nature photography, drawing, and/or painting	1	2	3	4	5
Rock and/or mountain climbing	1	2	3	4	5
Hiking	1	2	3	4	5
Adventure travel and/or ecotourism	1	2	3	4	5
Other (please specify) _____	1	2	3	4	5

38. As a result of being in the program, approximately how often have you participated in the activities listed below? (*Circle one number for each activity.*)

	A great deal	A Moderate Amount	Occasionally	Rarely	Never
Backpacking and/or camping	1	2	3	4	5
Hunting	1	2	3	4	5
Fishing	1	2	3	4	5
Scientific study of nature	1	2	3	4	5
Birding and other wildlife observation	1	2	3	4	5
Skiing	1	2	3	4	5
Canoeing, kayaking, and/or rafting	1	2	3	4	5
Nature photography, drawing, and/or painting	1	2	3	4	5
Rock and/or mountain climbing	1	2	3	4	5
Hiking	1	2	3	4	5
Adventure travel and/or ecotourism	1	2	3	4	5
Other (please specify) _____	1	2	3	4	5

39. Prior to participating in the program, please indicate your approximate level of skill in each of the areas listed below. (*Circle one number for each area.*)

	Expert	Could do it Fairly Easily	Could do it With Some Difficulty	Could not do it At all	No opinion	Not applicable
Wilderness camping	1	2	3	4	5	6
Topographic and trail map reading	1	2	3	4	5	6
Minimum impact camping	1	2	3	4	5	6
First aid and emergency medical skills	1	2	3	4	5	6
Tying ropes and knots	1	2	3	4	5	6
Building fires	1	2	3	4	5	6
Identifying flora & fauna	1	2	3	4	5	6
Knowledge of weather & climate	1	2	3	4	5	6
Identifying human impacts on the environment	1	2	3	4	5	6
Identifying rocks, land forms, and geology	1	2	3	4	5	6
Other (please specify) _____	1	2	3	4	5	6

40. As a result of the program, please indicate your approximate level of skill in each of the areas listed below. (*Circle one number for each area.*)

	Expert	Could do it Fairly Easily	Could do it With Some Difficulty	Could not do it At all	No opinion	Not applicable
Wilderness camping	1	2	3	4	5	6
Topographic and trail map reading	1	2	3	4	5	6
Minimum impact camping	1	2	3	4	5	6
First aid and emergency medical skills	1	2	3	4	5	6
Tying ropes and knots	1	2	3	4	5	6
Building fires	1	2	3	4	5	6
Identifying flora & fauna	1	2	3	4	5	6
Knowledge of weather & climate	1	2	3	4	5	6
Identifying human impacts on the environment	1	2	3	4	5	6
Identifying rocks, land forms, and geology	1	2	3	4	5	6
Other (please specify) _____	1	2	3	4	5	6

41. How much do you think your program helped you to work with or relate to other people in the ways listed below. (*Circle one number for each statement.*)

	A Great deal	A Moderate amount	Very little	Not at all	No opinion	Not applicable
Because of the program, I feel better able to compromise	1	2	3	4	5	6
Because of the program, I feel more open to other people's ideas and opinions	1	2	3	4	5	6
Because of the program, I am better able to meet new people	1	2	3	4	5	6
Because of the program, I am more patient.	1	2	3	4	5	6
Because of the program, I am more concerned with other people's feelings.	1	2	3	4	5	6
Because of the program, I am more trusting of others.	1	2	3	4	5	6

	A Great deal	A Moderate amount	Very little	Not at all	No opinion	Not applicable
Because of the program, I am more aware of the needs of the groups I participate in.	1	2	3	4	5	6
Because of the program, I work better with people of different age groups.	1	2	3	4	5	6
Because of the program, I am more accepting of people of other races and ethnic backgrounds.	1	2	3	4	5	6

42. Please indicate the type of impact your program had in helping you to deal with problems in the ways listed below. (*Circle one number for each area.*)

	A Very Positive Impact	A Moderately Positive Impact	A Moderately Negative Impact	A Very Negative Impact	No opinion	Not applicable
Being resourceful	1	2	3	4	5	6
Identifying and understanding problems	1	2	3	4	5	6
Solving problems	1	2	3	4	5	6
Evaluating the consequences of different actions	1	2	3	4	5	6
Delegating tasks to others	1	2	3	4	5	6
Choosing alternatives	1	2	3	4	5	6
Taking action	1	2	3	4	5	6
Seeing tasks to completion	1	2	3	4	5	6
Determining how to get a job done	1	2	3	4	5	6
Accepting criticism	1	2	3	4	5	6
Making decisions in difficult situations	1	2	3	4	5	6
Remaining calm in an emergency	1	2	3	4	5	6
Comparing one idea with another	1	2	3	4	5	6
Putting ideas together	1	2	3	4	5	6
Other (please specify) _____	1	2	3	4	5	6

43. Please indicate if you think your program helped your personal development in the ways listed below. (*Circle one number for each area.*)

	A Very Positive Impact	A Moderately Positive Impact	A Moderately Negative Impact	A Very Negative Impact	No opinion	Not applicable
Self-esteem	1	2	3	4	5	6
Self-respect	1	2	3	4	5	6
Tolerance	1	2	3	4	5	6
Compassion	1	2	3	4	5	6
Decisiveness	1	2	3	4	5	6
Peace of mind	1	2	3	4	5	6
Creativity	1	2	3	4	5	6
Clarity of thinking	1	2	3	4	5	6
Physical health	1	2	3	4	5	6
Stamina	1	2	3	4	5	6
Strength	1	2	3	4	5	6
Initiative	1	2	3	4	5	6
Boldness	1	2	3	4	5	6
Risk-taking	1	2	3	4	5	6
Self-reliance	1	2	3	4	5	6
Independence	1	2	3	4	5	6
Clarity of values	1	2	3	4	5	6
Comfort with being alone	1	2	3	4	5	6
Optimism	1	2	3	4	5	6
Inner direction	1	2	3	4	5	6
Self-confidence	1	2	3	4	5	6
Happiness	1	2	3	4	5	6
Maturity	1	2	3	4	5	6
Other (please specify) _____	1	2	3	4	5	6

44. How much do you think your program helped you in school in the ways listed below? (*Circle one number for each area.*)

	A Great deal	A Moderate amount	Very little	Not at all	No opinion	Not applicable
Increased my incentive to get better grades.	1	2	3	4	5	6
Increased my involvement in the school community.	1	2	3	4	5	6
Increased my interest in learning about the natural environment at school.	1	2	3	4	5	6
Increased my interest in school activities that focus on the environment.	1	2	3	4	5	6
Other (please specify) _____	1	2	3	4	5	6

45. Please indicate how much you agree with the statements listed below. (*Circle one number for each area.*)

	Strongly Agree	Agree	Disagree	Strongly Disagree	No opinion
Community service should be required of everyone.	1	2	3	4	5
Community service usually does not accomplish very much.	1	2	3	4	5
I am mostly interested in community service projects which benefit the environment.	1	2	3	4	5
The value of community service was not emphasized in my program.	1	2	3	4	5
Since participating in the program, I have been more interested in participating in community service programs.	1	2	3	4	5

46. How much do you think your program encouraged you to pursue the following actions?

	A Great deal	A Moderate amount	Very little	Not at all	No opinion	Not applicable
Obtain a formal education in some aspect of conservation, natural resource management, or environmental studies	1	2	3	4	5	6
Volunteer for community service projects	1	2	3	4	5	6
Encourage my friends and/or family to become more environmentally aware	1	2	3	4	5	6
Obtain a temporary or volunteer position in the environmental field	1	2	3	4	5	6
Obtain a permanent position in the environmental field	1	2	3	4	5	6

47. As a result of participating in the program, approximately how many courses have you taken in the following subject areas?

____ecology
____biology
____wildlife management
____forestry
____geology
____hydrology
____geography
____resource management
____anthropology
____education
____environmental policy
____other environmental subjects (please specify) _____

48. Finally, we are interested in the possible application to everyday life of skills you may have acquired in the program. Specifically, if you acquired the following skills in the program, how useful have they been to your everyday life? (If you did not acquire a particular skill, please circle not applicable.)

	Very useful	Somewhat useful	Marginally useful	Not at all useful	No opinion	Not applicable
Problem-solving skills	1	2	3	4	5	6
Coping skills	1	2	3	4	5	6
Decision-making skills	1	2	3	4	5	6
Risk-taking skills	1	2	3	4	5	6
Conflict-resolving skills	1	2	3	4	5	6
Group-participation skills	1	2	3	4	5	6
Wilderness skills	1	2	3	4	5	6
Creativity skills	1	2	3	4	5	6
Leadership skills	1	2	3	4	5	6
Interpersonal skills	1	2	3	4	5	6
Survival skills	1	2	3	4	5	6
Other	1	2	3	4	5	6

(please specify)_____

Now we have just a few broad questions to ask regarding the possible effects of your participation in the program.

49. Do you think your program had any major influence on the course of your life?

Yes ___
No ___

If yes, how so?

50. Do you think your program made you significantly more aware of the environment?

Yes ___
No ___

If yes, in what way?

51. Do you think your program had any major effect on your feeling of ethical responsibility or stewardship for the environment?

Yes ___
No ___

If yes, in what way?

52. What aspects of the program do you generally regard as most important and why?

53. Finally, do you have any major criticisms of the program?

Yes ___
No ___

If yes, what are these?

Before we conclude, we need some background information about yourself. This information will remain strictly confidential.

54. What is your age? _____

55. What is your gender? Male_____ Female _____

56. What is your racial or ethnic background?

White ____; Black ____; Hispanic___; Asian _____; Other (please specify) _____

57. Have you lived most of your life in a:

____city
____suburb
____small town
____rural area
____another country (please specify) _____

58. How much would you estimate your parents' annual income was at the time of your participation in the program?

____below $10,000
____$10,000-$34,999
____$35,000-$49,999
____$50,000-$99,999
____$100,000-149,999
____$150,000-199,999
____more than $200,000

59. What is the highest level of school have you completed?

___0-8th grade
___9-11th grade
___High School/Vocational School
___Some college;
___Completed college
___Graduate or Professional Degree

60. If you attended college, what was your undergraduate major?

61. If you attended graduate school, what was your area of specialization?

62. What is your current occupation?

If different, what is your usual occupation?

If you are currently a student, what occupation or profession do you anticipate pursuing?

Thank you so much for participating.

The information you provided will be very helpful in assessing the impact and designing more effective outdoor education programs.

Please return this survey in the enclosed, self-addressed envelope to:

Professor Stephen R. Kellert
Yale School of Forestry & Environmental Studies
205 Prospect Street
New Haven, CT 06511

A National Study of Experience-Based Environmental Education
Post-Experience Questionnaire

1. **Which program did you just participate in?**

___ Student Conservation Association

___ National Outdoor Leadership School

___ Outward Bound

2. **Where was the program held?**

3. **Would you say your overall program experience was:**

___ one of the best in your life
___ very good
___ moderately good
___ not very good
___ you would never do it again
___ no opinion

4. **In comparison with other experiences you have had, please rate the relative worth of this program with regard to the areas listed below.** (*Please circle one number for each area.*)

	very worthwhile	moderately worthwhile	not very worthwhile	not at all worthwhile	no opinion	not applicable
Overall Impact	1	2	3	4	5	6
Interest in the Environment	1	2	3	4	5	6
Personal Development (e.g., maturity, independence, self-confidence)	1	2	3	4	5	6
Intellectual Development (e.g., problem-solving, initiative, critical-thinking)	1	2	3	4	5	6
Career Choice	1	2	3	4	5	6
Outdoor Recreational Interests (e.g., hiking, camping, birding, fishing)	1	2	3	4	5	6
Interest in Community Service (e.g., volunteer activities, social service, philanthropy)	1	2	3	4	5	6

	very worthwhile	moderately worthwhile	not very worthwhile	not at all worthwhile	no opinion	not applicable
Other (please specify) _____	1	2	3	4	5	6
Other 2 (please specify) _____	1	2	3	4	5	6

5. **Please indicate your current level of interest in the following outdoor experiences.**
(Please circle one number for each activity.)

	very interested	moderately interested	somewhat interested	little interest	not at all interested	no opinion
camping and hiking in the outdoors	1	2	3	4	5	6
seeing attractive scenery	1	2	3	4	5	6
pursuing challenging activities like climbing mountains, running rivers, etc.	1	2	3	4	5	6
being spiritually inspired by nature	1	2	3	4	5	6
scientifically studying nature	1	2	3	4	5	6
pursuing outdoor hobbies, such as birdwatching, butterfly collecting, etc.	1	2	3	4	5	6
pursuing practical activities in the outdoors, such as gathering firewood, collecting wild foods, etc.	1	2	3	4	5	6
seeing wild animals, such as deer, eagles, raccoons, etc.	1	2	3	4	5	6
hunting or fishing	1	2	3	4	5	6
visiting areas important in the country's history, such as Mt. Rushmore, historic battlefields, etc.	1	2	3	4	5	6
testing your survival skills in the wild	1	2	3	4	5	6

	very interested	moderately interested	somewhat interested	little interest	not at all interested	no opinion
Other (please specify) _____	1	2	3	4	5	6
Other 2 (please specify) _____	1	2	3	4	5	6

6. **The following statements concern your general opinions about the environment. There are no right and wrong answers. If you have difficulty answering a question, please give your general or first impression.** (*Please circle one number for each statement.*)

	strongly agree	agree	disagree	strongly disagree	no opinion
I am not in favor of saving remote wilderness that most people will rarely have a chance to see.	1	2	3	4	5
I think we need to develop oil resources in places like the Arctic National Wildlife Refuge.	1	2	3	4	5
Preserving wild areas for scientific study is far less important today because we know so much more about how nature works.	1	2	3	4	5
Spending time in the wilderness is important for my psychological well-being.	1	2	3	4	5
I see little reason to preserve the forest habitat of a relatively unknown and useless endangered species if it results in less timber cut and higher lumber prices.	1	2	3	4	5
If I knew someone who had cancer that could be treated by using a rare plant or animal, I would sacrifice the species to treat that person.	1	2	3	4	5
If the choice was between preserving a swamp or filling it to build a factory that could provide jobs for poor people, I would choose to fill the wetland.	1	2	3	4	5
Spending more than a day or two in the wilderness makes me nervous.	1	2	3	4	5
I do not feel much spiritual connection with nature.	1	2	3	4	5
I would be afraid to be caught in a storm if I were camping in the wild.	1	2	3	4	5

6. (cont.)	strongly agree	agree	disagree	strongly disagree	no opinion
I think love is an emotion people should have for other people, not for nature.	1	2	3	4	5
I am more interested in individual animals than in ecological relationships among species.	1	2	3	4	5
When camping, I prefer to stay in a modern campground than in an isolated wilderness area.	1	2	3	4	5
Animals like grizzly bears and bighorn sheep should be protected even if some people have to make economic sacrifices.	1	2	3	4	5
I think it is nice to have beautiful animals like mute swans in the wild even if they are not originally native to the United States.	1	2	3	4	5
I have little desire to hike a long way into wild country just to see some mountain or canyon.	1	2	3	4	5
I think undesirable plants and animals like mosquitoes and poison ivy should be eliminated.	1	2	3	4	5
I am fascinated by the taxonomic differences among plants and animals.	1	2	3	4	5
Watching birds as a hobby strikes me as a waste of time.	1	2	3	4	5
I very much enjoy participating in scientific discussions of nature.	1	2	3	4	5

7. **Please check which activity you would most prefer in each of the following groups. If you would not wish to participate in any of the listed activities, mark none.**

a.	Fish in a stream___	White water kayak ___	Participate in a river clean-up ___	None___
b.	Read legends about bears___	See a bear in the wild___	Watch television programs about bears___	None___
c.	Have an animal as a pet___	See animals in the zoo___	See animals in the wild___	None___

d.	Study ecology___	Hunt or fish___	Photograph nature___	None___
e.	Listen for owls at night___	Help conserve owls___	Read stories about owls___	None___
f.	Restore animal habitat___	Help conserve a national symbol like the bald eagle___	Participate in scientific studies of wildlife___	None___
g.	Paint a picture of a pine forest___	Make pine furniture___	Scientifically study pine forests___	None___
h.	Spend a night in a campground___	Camp in a wilderness area___	Stay in a hotel near a wilderness area___	None___
i.	Climb to the top of a mountain___	See a mountain___	Build a house on a mountain___	None___

8. **Please indicate how much the program influenced your awareness of the following environmental problems in the United States today.** (*Circle one number for each issue.*)

	influenced a great deal	influenced some	did not influence very much	did not influence at all	no opinion	not applicable
loss of open space and recreation lands	1	2	3	4	5	6
human population growth	1	2	3	4	5	6
water pollution	1	2	3	4	5	6
species endangerment and extinction	1	2	3	4	5	6
excessive use of national parks	1	2	3	4	5	6
excessive litter and trash	1	2	3	4	5	6
air pollution	1	2	3	4	5	6
destruction of plant and animal habitat	1	2	3	4	5	6
loss of biological diversity	1	2	3	4	5	6

8. (cont.)	influenced a great deal	influenced some	did not influence very much	did not influence at all	no opinion	not applicable
declining quality of the urban environment	1	2	3	4	5	6
Other (please specify) _____	1	2	3	4	5	6

9. **How often do you anticipate participating in the following activities <u>because of your participation</u> in the program?** (*Circle one number for each activity.*)

	a great deal	a moderate	occasionally	rarely	never
writing letters to government officials about the environment	1	2	3	4	5
working with citizen groups about the environment	1	2	3	4	5
donating money to organizations concerned with the environment	1	2	3	4	5
volunteering with organizations concerned with the environment	1	2	3	4	5
participating in environmental protests, such as demonstrating or picketing	1	2	3	4	5
avoiding the use or purchase of certain products because of their environmental impact	1	2	3	4	5
recycling products at home	1	2	3	4	5
using public transportation	1	2	3	4	5
taking courses about the environment	1	2	3	4	5
reading about the environment	1	2	3	4	5
attending meetings at school or in the community about the environment.	1	2	3	4	5
Other (please specify) _____	1	2	3	4	5

10. **The following questions concern possible impacts that may have resulted from participation in your program. We realize some of these impacts may have resulted from experiences other than those in the program. However, we are only interested in whether or not, in your opinion, these impacts resulted because of your program experience.** (*Please circle one number for each statement.*)

	strongly agree	agree	disagree	strongly disagree	no opinion or not applicable
Because of the program, I am more convinced that human ingenuity will find solutions to most of our environmental problems.	1	2	3	4	5
Because of the program, I have a greater sense of humility towards the environment.	1	2	3	4	5
" " " , I feel more spiritually connected with nature.	1	2	3	4	5
" " " , I realize how much I enjoy taking care of myself in the wild.	1	2	3	4	5
" " " , I realize how much I like to recreate in the outdoors.	1	2	3	4	5
" " " , I no longer view nature as being as complex as I once thought.	1	2	3	4	5
" " " , I have a much stronger interest in ecology.	1	2	3	4	5
" " " , I am much more aware of how frightening and dangerous the wilderness can be.	1	2	3	4	5
" " " , I discovered my ability to be resourceful and self-reliant.	1	2	3	4	5
" " " , I like to test my physical abilities in rough and challenging terrain.	1	2	3	4	5
" " " , I have learned new skills which I now use whenever I get a chance.	1	2	3	4	5
" " " , I realize I am not particularly comfortable living in primitive conditions.	1	2	3	4	5
" " " , I will try to cut down on the amount of litter and waste I generate.	1	2	3	4	5
" " " , I will participate more in organizations concerned with protecting the environment.	1	2	3	4	5

11. **How much do you think your program experience changed any of the following attitudes toward the environment?** (*Circle one number for each statement.*)

	a great deal	a moderate amount	somewhat	not very much	not at all	no opinion or not applicable
Because of the program, I am more aware of the sights, sounds, and smells of nature.	1	2	3	4	5	6
" " " " , I have a greater feeling of awe for nature.	1	2	3	4	5	6
" " " " , I feel in greater harmony with nature.	1	2	3	4	5	6
" " " " , I have a greater aesthetic appreciation for nature.	1	2	3	4	5	6
" " " " , I feel more responsible for conserving and protecting nature.	1	2	3	4	5	6
" " " " , I have a greater respect for nature.	1	2	3	4	5	6
" " " " , I will be more willing to sacrifice economic gain in order to protect nature.	1	2	3	4	5	6

The following questions concern your general knowledge of the environment. Please do not be concerned if you cannot answer many of these questions. Very few people can.

Please circle the correct answer.

12. **The phrase "carrying capacity" refers to:**

a) the ability to transport goods;
b) the weight of varying vessels in the ocean;
c) the volume of different gases in the atmosphere;
d) the limits to a species population growth in the environment;
e) all of the above.

13. **The most frequent reason today for plant and animal extinctions is:**

a) human hunting for food and recreation;
b) the inability of species to compete;
c) the destruction of natural habitat;
') the introduction of nonnative species.

14. **Erosion can result from which of the following:**

a) clearcutting forests on steep slopes;
b) not planting after an area has been used to grow agricultural crops;
c) roadbuilding along the ridges of steep hills and mountains;
d) overgrazing by cattle and sheep;
e) all of the above.

15. **Which of the following can regulate the population size of a species:**

a) predators;
b) disease;
c) environmental change;
d) all of the above.

16. **The ecological role of a fungus is:**

a) decomposition and release of nutrients back into the environment;
b) warning that an ecosystem is being degraded;
c) replenishing aquifers;
d) photosynthesizing food for other organisms.

17. **The term "resource depletion" generally refers to:**

a) a decreasing amount of natural resources;
b) an increasing availability of natural resources;
c) producing more natural resources;
d) using fewer natural resources.

18. **Multiple use means:**

a) raising various crops in an area;
b) the abundance and distribution of species in an ecosystem;
c) managing land for various purposes;
d) creating a stable, self-sustaining environment.

19. **Sustained yield is generally defined as:**

a) harvesting immature individuals of a species;
b) creating a range of chemical and physical conditions for a species' survival;
c) a species' ecological niche;
d) the rate a resource can be exploited without reducing its supply over time.

20. **Current controversy over public lands concerns:**

a) grazing fees;
b) drilling for oil on federal government lands and waters;
c) farming on marginal lands;
d) a & b only;
e) a, b, and c.

21. **When too much fertilizer or sewage is added to a lake, the effect is called:**

a) overflow;
b) edaphic;
c) acceleration;
d) eutrophication.

22. **Earthworms are beneficial in which of the following ways:**

a) decomposing leaves;
b) increasing the amount of organic matter in the soil;
c) loosening soil particles;
d) providing food for birds and small mammals;
e) all of the above.

23. **Biodiversity generally refers to:**

a) different types of plant and animal species;
b) the different ways species interact with each other;
c) breeds of domestic animals;
d) all of the above;
e) none of the above.

24. **There are more species of which type of animal:**

a) fish;
b) mammal;
c) insect;
d) bird.

25. **The roots of forest plants help to:**

a) break soil down;
b) hold soil together;
c) increase infiltration of water into soil;
d) a and b;
e) a, b, and c;
f) none of the above.

26. **Please indicate how much you think the following sources of information have increased your understanding of the natural environment.** (*Circle one number for each source.*)

	very much	a moderate amount	a little	not at all	no opinion	not applicable
high school	1	2	3	4	5	6
college	1	2	3	4	5	6
outdoor recreation activities	1	2	3	4	5	6
participation in this program	1	2	3	4	5	6
informal discussions with friends	1	2	3	4	5	6
informal discussions with family	1	2	3	4	5	6

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26. (cont.)

	very much	a moderate amount	a little	not at all	no opinion	not applicable
watching television	1	2	3	4	5	6
reading books and magazines	1	2	3	4	5	6
other (please specify) _____	1	2	3	4	5	6

27. **There are various ways your program may have increased your understanding of the natural environment. Please indicate how much any of the following possible program experiences increased your understanding of the natural environment.** (*Circle one number for each area.*)

	very much	a moderate amount	a little	not at all	no opinion	not applicable
natural history study (plant and animal identification, collecting, etc.)	1	2	3	4	5	6
research and scientific study	1	2	3	4	5	6
lectures and demonstrations	1	2	3	4	5	6
informal discussions	1	2	3	4	5	6
assigned reading	1	2	3	4	5	6
field trips	1	2	3	4	5	6
resource conservation activities	1	2	3	4	5	6
environmental restoration activities	1	2	3	4	5	6
trail building activities	1	2	3	4	5	6
wilderness survival activities	1	2	3	4	5	6
map reading and orienteering in the wild	1	2	3	4	5	6
outdoor adventure activities (e.g., mountain and rock climbing, canoeing and kayaking, etc.)	1	2	3	4	5	6
hunting and/or fishing	1	2	3	4	5	6
birding and other wildlife observation activities	1	2	3	4	5	6
other (please specify) _____	1	2	3	4	5	6
other 2 (please specify) _____	1	2	3	4	5	6

28. **Please indicate how much you think your program increased your knowledge of the natural environment in the areas listed below.** (*Circle one number for each area.*)

	very much	a moderate amount	a little	not at all	no opinion or not applicable
General awareness of the natural environment	1	2	3	4	5
Ability to identify various plants and animals	1	2	3	4	5
Knowledge of geology and geography	1	2	3	4	5
Knowledge of ecology	1	2	3	4	5

28. (cont.)

	very much	a moderate amount	a little	not at all	no opinion or not applicable
Knowledge of human impacts on the environment	1	2	3	4	5
Knowledge of conservation	1	2	3	4	5
Knowledge of wildlife	1	2	3	4	5
Knowledge of botany and forestry	1	2	3	4	5
Knowledge of hydrology	1	2	3	4	5
Knowledge of weather and climate	1	2	3	4	5
Knowledge of government agencies that administer laws concerning the natural environment	1	2	3	4	5
Knowledge of interest groups concerned with the environment	1	2	3	4	5
Knowledge of past and present land use	1	2	3	4	5
Knowledge of environmental justice issues	1	2	3	4	5
Other (please specify) _____	1	2	3	4	5
Other 2 (please specify) _____					

29. **As a result of being in the program, approximately how often do you anticipate participating in the activities listed below?** (*Circle one number for each area.*)

	a great deal	a moderate	occasionally	rarely	never
backpacking and/or camping	1	2	3	4	5
hunting	1	2	3	4	5
fishing	1	2	3	4	5
scientific study of nature	1	2	3	4	5
birding and other wildlife observation	1	2	3	4	5
skiing	1	2	3	4	5
canoeing, kayaking, and/or rafting	1	2	3	4	5
nature photography, drawing, and/or painting	1	2	3	4	5
rock and/or mountain climbing	1	2	3	4	5
hiking	1	2	3	4	5
adventure travel and/or ecotourism	1	2	3	4	5
other (please specify) _____	1	2	3	4	5

30. **As a result of the program, please indicate your approximate level of skill in each of the areas listed below.** (*Circle one number for each area.*)

	expert	I could do it fairly easily	I could do it with some difficulty	I could not do it at all	no opinion	not applicable
wilderness camping	1	2	3	4	5	6
topographic and trail map reading	1	2	3	4	5	6
minimum impact camping	1	2	3	4	5	6
first aid and emergency medical skills	1	2	3	4	5	6
tying ropes and knots	1	2	3	4	5	6
building fires	1	2	3	4	5	6
identifying flora & fauna	1	2	3	4	5	6
knowledge of weather and climate	1	2	3	4	5	6
identifying human impacts on the environment	1	2	3	4	5	6
identifying rocks, land forms, and geology	1	2	3	4	5	6
other (please specify) _____	1	2	3	4	5	6

31. **How much do you think your program helped you to work with or relate to other people in the ways listed below?** (*Circle one number for each statement.*)

	strongly agree	agree	disagree	strongly disagree	no opinion
I compromise easily.	1	2	3	4	5
I am not open to other people's ideas and opinions.	1	2	3	4	5
I have difficulty meeting new people.	1	2	3	4	5
I am patient.	1	2	3	4	5
I am concerned with other people's feelings.	1	2	3	4	5
I do not trust others.	1	2	3	4	5
I am aware of the needs of the groups I participate in.	1	2	3	4	5
I do not work well with people of different age groups.	1	2	3	4	5
I am accepting of people of other races and ethnic backgrounds.	1	2	3	4	5

32. **Please indicate the degree of impact your program had in helping you to deal with problems in the ways listed below.** (*Circle one number for each area.*)

	very capable	moderately capable	not very capable	not capable	no opinion
being resourceful	1	2	3	4	5
identifying and understanding problems	1	2	3	4	5
solving problems	1	2	3	4	5
evaluating the consequences of different actions	1	2	3	4	5

32. (cont.)

	very capable	moderately capable	not very capable	not capable	no opinion
delegating tasks to others	1	2	3	4	5
choosing alternatives	1	2	3	4	5
taking action	1	2	3	4	5
seeing tasks to completion	1	2	3	4	5
determining how to get a job done	1	2	3	4	5
accepting criticism	1	2	3	4	5
making decisions in difficult situations	1	2	3	4	5
remaining calm in an emergency	1	2	3	4	5
comparing one idea with another	1	2	3	4	5
putting ideas together	1	2	3	4	5
other (please specify) _____	1	2	3	4	5

33. **Please indicate if you think your program helped your personal development in the ways listed below.** (*Circle one number for each area.*)

	very positive	moderately positive	moderately negative	very negative	no opinion
self-esteem	1	2	3	4	5
self-respect	1	2	3	4	5
tolerance	1	2	3	4	5
compassion	1	2	3	4	5
decisiveness	1	2	3	4	5
peace of mind	1	2	3	4	5
creativity	1	2	3	4	5
clarity of thinking	1	2	3	4	5
physical health	1	2	3	4	5
stamina	1	2	3	4	5
strength	1	2	3	4	5
initiative	1	2	3	4	5
boldness	1	2	3	4	5
risk-taking	1	2	3	4	5
self-reliance	1	2	3	4	5
independence	1	2	3	4	5
clarity of values	1	2	3	4	5
comfort with being alone	1	2	3	4	5
optimism	1	2	3	4	5
inner direction	1	2	3	4	5
self-confidence	1	2	3	4	5
happiness	1	2	3	4	5
maturity	1	2	3	4	5
other (please specify) _____	1	2	3	4	5

34. **How much do you think your program will help you in school in the ways listed below?**
(Circle one number for each statement.)

	strongly agree	agree	disagree	strongly disagree	no opinion
It will be very important for me to get good grades.	1	2	3	4	5
I will be very involved in the school community.	1	2	3	4	5
I will not be very interested in learning about the natural environment at school.	1	2	3	4	5
I will be interested in school activities that focus on conservation and the environment.	1	2	3	4	5

35. **Please indicate how much you agree with the statements listed below using the following scale:**
(Circle one number for each statement.)

	strongly agree	agree	disagree	strongly disagree	no opinion
Community service should be required of everyone.	1	2	3	4	5
Community service usually does not accomplish very much.	1	2	3	4	5
I am mostly interested in community service projects that benefit the environment.	1	2	3	4	5
Community service was an important part of this program.	1	2	3	4	5
I am very interested in participating in community service programs.	1	2	3	4	5

36. **How much do you think your program will encourage you to pursue the following actions?**
(Circle one number for each activity.)

	very interested	moderately interested	not very interested	not at all interested	no opinion
Obtain a formal education in some aspect of conservation, natural resource management, or environmental studies.	1	2	3	4	5
Volunteer for community service projects.	1	2	3	4	5
Encourage my friends and/or family to become more environmentally aware.	1	2	3	4	5

36. (cont.)

	very interested	moderately interested	not very interested	not at all interested	no opinion
Obtain a temporary or volunteer position in the environmental field.	1	2	3	4	5
Obtain a permanent position in the environmental field.	1	2	3	4	5

37. **As a result of participating in the program, how interested are you in pursuing the following subjects?**
(*Circle one number for each topic.*)

	very interested	moderately interested	somewhat interested	little interest	not at all interested	no opinion
ecology	1	2	3	4	5	6
biology	1	2	3	4	5	6
wildlife management	1	2	3	4	5	6
forestry	1	2	3	4	5	6
geology	1	2	3	4	5	6
hydrology	1	2	3	4	5	6
geography	1	2	3	4	5	6
resource management	1	2	3	4	5	6
anthropology	1	2	3	4	5	6
education	1	2	3	4	5	6
environmental policy	1	2	3	4	5	6
other environmental subjects (please specify) _____	1	2	3	4	5	6

38. **Finally, we are interested in the possible application to everyday life of skills you may have acquired in the program. Specifically, if you acquired the following skills in the program, how useful do you anticipate them being for your everyday life? (If you did not acquire a particular skill, please mark not applicable.)**
(*Circle one number for each skill.*)

	very useful	somewhat useful	marginally useful	not at all useful	no opinion or not applicable
Problem-solving skills	1	2	3	4	5
Coping skills	1	2	3	4	5
Decision-making skills	1	2	3	4	5
Risk-taking skills	1	2	3	4	5
Conflict-resolving skills	1	2	3	4	5
Group-participation skills	1	2	3	4	5
Wilderness skills	1	2	3	4	5
Creativity skills	1	2	3	4	5
Leadership skills	1	2	3	4	5
Interpersonal skills	1	2	3	4	5
Survival skills	1	2	3	4	5
Other (please specify) _____	1	2	3	4	5

We have just a few broad questions to ask regarding the possible effects of your participation in the program.

39. **Do you think your program will have a major influence on the course of your life?**

Yes ___
No ___

If yes, how so?

40. **Do you think your program has made you significantly more aware of the environment?**

Yes ___
No ___

If yes, in what way?

41. **Do you think your program has had any major effect on your feeling of ethical responsibility or stewardship for the environment?**

Yes ___
No ___

If yes, in what way?

42. What aspect(s) of the program do you regard as most important and why?

43. How did interpersonal dynamics affect your experience?

44. Finally, do you have any major criticisms of the program?

Yes ___
No ___

If yes, what are these?

45. Before we conclude, we will need your address and phone, where you can be reached six months to a year from now:

Thank you so much for participating. The information you provided will be very helpful in assessing the impact and designing more effective outdoor education programs.

APPENDIX D:

IN-DEPTH SURVEY

Immediate Post-experience Open-ended Interview

Respondent Name and Number:
Date:
Program:

1. How do you anticipate this program will affect your life?.

2. How significant do you think these changes will be?

3. Did participation in a group affect your experience in any significant way? If yes, explain.

4. Did participating in a group positively affect your ability to work with others?

    7. To be more accepting or tolerant of others?

    8. To be more open-minded and adaptable when being with others?

9. Did the group experience and/or friends you made on this trip change your views in any other significant ways? If yes, how so?

10. Did your awareness or concern for the environment significantly change as a consequence of participating in this program? If yes, in what ways?

    11. Did your feelings of affection and appreciation for nature significantly change because of the program? If yes, how so?

    12. Has your awareness or concern for human impacts on the natural environment changed in any significant way as a consequence of your experience? If yes, in what ways?

    13. Has your sense of respect and/or stewardship for nature significantly changed because of the experience? If yes, how so?

    14. Would you say your feelings of ethical or moral responsibility for nature have changed? If yes, in what ways?

15. Did your experience affect your feelings of respect toward yourself or others? If yes, how so?

16. Did it affect your feelings of peacefulness or calm? If yes, in what ways?

17. Did it affect your self-esteem or self-confidence in any significant way? If yes, how so?

18. Do you think your experience has significantly affected your ability to face challenges, as well as the ability to meet these challenges? If yes, in what ways?

19. Do you think your experience has affected your ability to set goals and accomplish tasks? If yes, in what ways?

20. Do you feel any better able to solve problems as a consequence of your experience? If yes, how so?

21. Do you feel any more self-sufficient and independent because of this experience? If yes, how so?

22. Do you feel any better able to make decisions? If yes, in what ways?

23 Do you think the skills you learned in this program will affect you in any significant ways beyond your ability to be in the outdoors? If yes, how so?

24 Do you anticipate this experience will affect your career decisions in any significant way? If yes, in what ways?

25 Did your experience make you feel, in any significant way, that one person can make a major difference in this world? If yes, how so?

26. Do you think this kind of experience is relevant or important to your everyday life? If yes, how so?

27. Do you feel like the same person or, in some way, significantly different as a consequence of this experience? If different, please explain the ways you think you have changed.

28. What aspects of the program do you view as most important and why?

29 Based on your participation in this program, do you think there is something fundamentally different in learning by doing or experiencing in contrast to learning in other ways? Please explain.

30 Was it important that this learning experience occurred in a wilderness and/or outdoors setting? If yes, what do you think was important about the wilderness/outdoors setting for your experience?

31. Did your feelings about urban life and the built environment change in any way because of your experience? If yes, how so?

32. Do you have major criticisms of the program? If yes, please explain.

33. Do you have suggestions for ways the program could be significantly improved?

PROPOSED DELAYED INTERVIEW

1. How did your participation in the program affect your life?

2. How significant do you think these changes have been?

3. Do you feel that you can incorporate the lifestyle you had in your program into your day to day life? If yes, how, and if no, why not?

4. Has your awareness, appreciation, or concern for the environment significantly changed as a consequence of participating in the program? If yes, in what ways?

5. Has your sense of respect and/or stewardship for nature significantly changed because of your experience? If yes, how so?

6. What kinds of things are you doing that you did not do before your participation in the program?

7. Do you think the skills you learned in the program have affected you in significant ways beyond your ability to be in the outdoors? If yes, how so?

8. What aspects of the program do you view as the most important and why?

9. Was it important that your experience occurred in a wilderness or outdoors setting? If yes,

10. What do you think was important about the wilderness/outdoors setting for your experience?

11. Have your feelings about your hometown or city changed in any way because of your experience? If yes, how so?

12. How has the program affected the ways you think about the natural environment where you live?

13. Do you have any major criticisms of the program? If yes, please explain.

14. Do you have any suggestions for ways that the program could be significantly improved?

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