Copyright Statement

The digital copy of this thesis is protected by the Copyright Act 1994 (New Zealand).

This thesis may be consulted by you, provided you comply with the provisions of the Act and the following conditions of use:

- you will use the copy only for the purposes of research or private study
- you will recognise the author's right to be identified as the author of the thesis and due acknowledgement will be made to the author where appropriate
- you will obtain the author's permission before publishing any material from the thesis.
THE EVALUATION OF OUTCOMES
OF RESIDENT OUTDOOR EDUCATION
- a study of selected Christchurch Schools

A thesis
submitted in partial fulfilment
of the requirements for the degree
of
Master of Science
in the
University of Canterbury

by

B. J. MacKay

Joint Centre for Environmental Sciences
University of Canterbury and Lincoln College
1981
Abstract of a thesis submitted in partial fulfilment of the requirements for the Degree of M.Sc. in Resource Management.

THE EVALUATION OF OUTCOMES OF RESIDENT OUTDOOR EDUCATION
- a study of selected Christchurch schools

by

B. J. MacKay

This thesis describes an exercise in curriculum evaluation of resident outdoor education programmes in New Zealand. It is the first known formal attempt to evaluate multiple outcomes of school camps in this country.

Expected outcomes of resident outdoor education were determined through a survey of 80% of Christchurch schools. Outcomes selected for measurement were self concept, social skills and environmental attitudes.

Evaluation of outcomes was conducted at three age levels, (10, 14 and 16 years) and two academic levels, (low and high ability). Established psychometric tests were employed, supplemented with questionnaires and observations. The reliability and validity of the tests were re-established and found to be adequate.

Results suggest that actual outcomes were limited. The younger and low-ability groups appeared to be the most responsive to outdoor experiences.

Statistically significant gains in self concept were observed among the 10 year age groups. In addition, one group of older, but low-ability students made a notable increase in their self concept score.

In the area of social skill development, an improvement in teacher/student relationships was tentatively identified in a limited number of groups. Tests did not show improved relationships among classmates or in class cohesiveness, although further assessment of these intended outcomes may be warranted.
No statistically significant gains in environmental attitudes were achieved by any experimental group. However, one low-ability group showed a significant decline in their wilderness attitude while the corresponding control group showed a significant increase in their outdoor attitude.

Implications of the results for future development of outdoor education programmes in New Zealand are discussed. Possible reasons for the general failure of these camps to achieve intended outcomes and suggestions for improvement are offered.

Two important points emerge from this study. The first is that the success of camps may partially depend on advance classroom preparation. The second is that environmental attitudes might be better promoted in the classroom than on school camps.
# TABLE OF CONTENTS

## CHAPTER 1.0 INTRODUCTION

1.1 Need for this study

1.2 Scope of this investigation

1.3 Objectives of the study

1.4 Assumptions used for this study

1.5 Limitations of this study

1.6 Organisation of ensuing chapters

## CHAPTER 2.0 THE NATURE OF OUTDOOR EDUCATION

## CHAPTER 3.0 LITERATURE REVIEW

3.1 Evaluation and attitude measurement techniques

3.1.1 Evaluation techniques

3.1.2 Attitude measurement techniques

3.2 Review of related research studies

3.2.1 Pre 1970 studies

3.2.2 Post 1970 evaluation studies

3.3 Summary and conclusions of the literature review

## CHAPTER 4.0 METHODS

4.1 Teacher questionnaire - survey

4.1.1 Summary of survey results

4.2 Procedures Used

4.2.1 The Self Concept Scale

4.2.2 The Millward-Ginter Outdoor Attitude Inventory

4.2.3 The Wilderness Attitude Scale and the Environmental Concern Scale

4.3 Experimental design

4.4 Administration for Standard IV and Form IV students

4.5 Scoring and Analysis
## 5.0 RESULTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1.1</td>
<td>Background</td>
<td>51</td>
</tr>
<tr>
<td>5.1.2</td>
<td>Results</td>
<td>54</td>
</tr>
<tr>
<td>5.1.3</td>
<td>Summary of Test Results of the Standard IV Camp One Experiment</td>
<td>55</td>
</tr>
<tr>
<td>5.2.1</td>
<td>Background</td>
<td>57</td>
</tr>
<tr>
<td>5.2.2</td>
<td>Results</td>
<td>61</td>
</tr>
<tr>
<td>5.2.3</td>
<td>Summary of Test Results of the Standard IV Camp Two Experiment</td>
<td>61</td>
</tr>
<tr>
<td>5.3.1</td>
<td>Background</td>
<td>63</td>
</tr>
<tr>
<td>5.3.2</td>
<td>Results</td>
<td>71</td>
</tr>
<tr>
<td>5.3.3</td>
<td>Summary of Test Results of the Form IV Camp One Experiment</td>
<td>72</td>
</tr>
<tr>
<td>5.4.1</td>
<td>Background</td>
<td>74</td>
</tr>
<tr>
<td>5.4.2</td>
<td>Results</td>
<td>81</td>
</tr>
<tr>
<td>5.4.3</td>
<td>Summary of Test Results for Form IV Camp Two Experiment</td>
<td>82</td>
</tr>
<tr>
<td>5.5.1</td>
<td>Background</td>
<td>84</td>
</tr>
<tr>
<td>5.5.2</td>
<td>Results</td>
<td>87</td>
</tr>
<tr>
<td>5.5.3</td>
<td>Summary of Test Results of the Form VI Camp</td>
<td>90</td>
</tr>
</tbody>
</table>

## 6.0 DISCUSSION AND CONCLUSIONS

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1</td>
<td>Is O/E a change-agent for self concept?</td>
<td>93</td>
</tr>
<tr>
<td>6.2</td>
<td>Is O/E a change-agent for social skills?</td>
<td>97</td>
</tr>
<tr>
<td>6.3</td>
<td>Is O/E a change-agent for environmental attitudes?</td>
<td>103</td>
</tr>
<tr>
<td>6.4</td>
<td>Conclusions</td>
<td>100</td>
</tr>
<tr>
<td>6.5</td>
<td>Comments about the specific instruments used in this study</td>
<td>102</td>
</tr>
<tr>
<td>6.6</td>
<td>Recommendations for further research</td>
<td>103</td>
</tr>
<tr>
<td>APPENDICES</td>
<td>PAGE</td>
<td></td>
</tr>
<tr>
<td>------------</td>
<td>------</td>
<td></td>
</tr>
<tr>
<td>A: Teacher Questionnaire-Survey</td>
<td>113</td>
<td></td>
</tr>
<tr>
<td>B: Methods Trial</td>
<td>123</td>
<td></td>
</tr>
<tr>
<td>C: Psychometric Tests</td>
<td>126</td>
<td></td>
</tr>
<tr>
<td>D: Questionnaires</td>
<td>138</td>
<td></td>
</tr>
<tr>
<td>E: Psychometric Test Results</td>
<td>142</td>
<td></td>
</tr>
<tr>
<td>F: Sources Consulted</td>
<td>151</td>
<td></td>
</tr>
</tbody>
</table>
LIST OF TABLES

<table>
<thead>
<tr>
<th>TABLE</th>
<th>Commonly-cited educational objectives for resident outdoor education.</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>Number of participating schools and teachers in survey of expected outcomes of resident outdoor education.</td>
<td>8</td>
</tr>
<tr>
<td>4.1</td>
<td>Average rankings of expected O/E outcomes as given by survey respondents.</td>
<td>30</td>
</tr>
<tr>
<td>4.2</td>
<td>Names and formats of tests used in this study at each of the three educational levels.</td>
<td>32</td>
</tr>
<tr>
<td>4.3</td>
<td>Reported reliabilities for self concept instruments used in this study.</td>
<td>37</td>
</tr>
<tr>
<td>4.4</td>
<td>Correlations between Outdoor Attitude subscales.</td>
<td>39</td>
</tr>
<tr>
<td>4.5</td>
<td>Correlations between Outdoor Attitude Inventory and other scales.</td>
<td>42</td>
</tr>
<tr>
<td>4.6</td>
<td>Reliability indices for Passineau Scales</td>
<td>44</td>
</tr>
<tr>
<td>5.1</td>
<td>Mean self concept scores for the Standard IV experimental and control groups - camp one.</td>
<td>51</td>
</tr>
<tr>
<td>5.2</td>
<td>Mean outdoor attitude scores for the Standard IV experimental and control groups - camp one.</td>
<td>53</td>
</tr>
<tr>
<td>5.3</td>
<td>Self concept scores for Standard IV students - camp two over a four-week period.</td>
<td>57</td>
</tr>
<tr>
<td>5.4</td>
<td>Mean scores on the Outdoor Attitude Inventory for Standard IV students - camp two.</td>
<td>60</td>
</tr>
<tr>
<td>5.5</td>
<td>Mean self concept scores for the Form IV experimental and control groups - camp one.</td>
<td>64</td>
</tr>
<tr>
<td>5.6</td>
<td>Mean outdoor attitude scores for the Form IV experimental and control groups in camp one.</td>
<td>67</td>
</tr>
<tr>
<td>5.7</td>
<td>Mean wilderness attitude scores for the Form IV experimental and control groups - camp one.</td>
<td>69</td>
</tr>
<tr>
<td>TABLE</td>
<td>PAGE</td>
<td></td>
</tr>
<tr>
<td>-------</td>
<td>------</td>
<td></td>
</tr>
<tr>
<td>5.8</td>
<td>Mean self concept scores for the Form IV experimental and control groups - camp two.</td>
<td>75</td>
</tr>
<tr>
<td>5.9</td>
<td>Percentage of students in all the groups which showed significant shifts in their self concept scores.</td>
<td>75</td>
</tr>
<tr>
<td>5.10</td>
<td>Mean scores on the Outdoor Attitude Inventory for the Form IV experimental and control groups in camp two.</td>
<td>77</td>
</tr>
<tr>
<td>5.11</td>
<td>Mean total scores for the Wilderness Attitude Scale for Form IV experimental and control groups in camp two.</td>
<td>79</td>
</tr>
<tr>
<td>5.12</td>
<td>Mean scores for the Environmental Concern and Wilderness Attitude Scales for the Form VI experimental and control groups.</td>
<td>85</td>
</tr>
<tr>
<td>6.1</td>
<td>Summary of the characteristics, methods and results of the five experiments, conducted in this study.</td>
<td>89</td>
</tr>
<tr>
<td>FIGURE</td>
<td>DESCRIPTION</td>
<td>PAGE</td>
</tr>
<tr>
<td>--------</td>
<td>-----------------------------------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>2.1</td>
<td>A general interpretation of outdoor education.</td>
<td>7</td>
</tr>
<tr>
<td>4.1</td>
<td>Rankings of intended outcomes of resident O/E experiences by Christchurch teachers.</td>
<td>33</td>
</tr>
<tr>
<td>5.1</td>
<td>Mean and range of scores on the Self Concept Scale for the Standard IV experimental and control groups - camp one.</td>
<td>52</td>
</tr>
<tr>
<td>5.2</td>
<td>Mean and range of scores on the Outdoor Attitude Inventory for Standard IV experimental and control groups - camp one.</td>
<td>53</td>
</tr>
<tr>
<td>5.3</td>
<td>The Time-Series experimental design used with Standard IV students - camp two.</td>
<td>56</td>
</tr>
<tr>
<td>5.4</td>
<td>Mean and range of scores on the Self Concept Scale for Standard IV students - camp two.</td>
<td>58</td>
</tr>
<tr>
<td>5.5</td>
<td>Mean and range of scores on the Outdoor Attitude Inventory for Standard IV students - camp two.</td>
<td>60</td>
</tr>
<tr>
<td>5.6</td>
<td>Mean and range of self concept scores for Form IV experimental and control groups - camp one.</td>
<td>65</td>
</tr>
<tr>
<td>5.7</td>
<td>Mean and range of scores on the Outdoor Attitude Inventory for the Form IV experimental and control groups - camp one.</td>
<td>68</td>
</tr>
<tr>
<td>5.8</td>
<td>Mean and range of scores on the Wilderness Attitude Scale for the Form IV experimental and control groups - camp one.</td>
<td>70</td>
</tr>
<tr>
<td>5.9</td>
<td>Mean and range of scores on the Self Concept Scale for Form IV experimental and control groups - camp two.</td>
<td>76</td>
</tr>
<tr>
<td>5.10</td>
<td>Mean and range of scores on the Outdoor Attitude Inventory for the Form IV experimental and control groups - camp two.</td>
<td>78</td>
</tr>
<tr>
<td>FIGURE</td>
<td>Description</td>
<td>Page</td>
</tr>
<tr>
<td>--------</td>
<td>-----------------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>5.11</td>
<td>Mean and range of scores on the Wilderness Attitude Scale for the Form IV experimental and control groups - camp two.</td>
<td>80</td>
</tr>
<tr>
<td>5.12</td>
<td>Mean and range of scores on the Environmental Concern Scale for Form VI experimental and control groups.</td>
<td>86</td>
</tr>
<tr>
<td>5.13</td>
<td>Mean and range of scores on the Wilderness Attitude Scale for Form VI experimental and control groups.</td>
<td>86</td>
</tr>
</tbody>
</table>
OUTDOOR PURSUITS and SOCIAL AND PERSONAL DEVELOPMENT - two common components of resident outdoor education in New Zealand.
INTRODUCTION

1.1 NEED FOR THIS STUDY

At a time when all western societies are demonstrating increasing environmental and social concern, a response of the education system has been to involve their students in outdoor education (O/E). A recent almost exponential increase in student numbers participating in school camps (or resident O/E) has been witnessed in New Zealand. Those people involved with O/E are strongly committed to the school camp. They consider it an effective process for instigating attitudes of concern for the natural environment; and that it contributes to the improvement of social relationships and the self concept of students.

School camps have entailed considerable investment of the presently limited New Zealand educational resources. Despite this commitment, the reality of the benefits of this investment of time, money, people and natural resources has not been formally proven. The overall goal of this study then, is to initiate an inquiry into whether or not O/E is an effective means of attaining educational objectives.

The need for an extensive evaluation programme is becoming increasingly apparent. Overseas research suggests that the outcomes of resident O/E vary and evidence for the benefits of school camps is still inconclusive. This is certainly true of New Zealand also. 'Improved self concept is one of the most commonly cited objectives of resident O/E. However, the only known formal study on New Zealand outdoor education concluded that a 10-day camp was probably ineffective at changing students' self concept. Other expected outcomes of O/E (i.e., social skills, environmental knowledge and attitudes) have not been effectively assessed and/or made publically known to date in New Zealand.
1.2 **SCOPE OF THIS INVESTIGATION**

The lack of any formal evaluation studies of outcomes of O/E in New Zealand dictated the nature of this investigation. An overview of the present situation was needed. However, the scope of this study has had to be restricted to Christchurch schools. Resident O/E programmes at three different age levels (Standard IV, Form IV and Form VI) and two different academic levels (lower ability and upper ability) were selected for study. The outcomes to be assessed varied with the particular camp under study, but generally included one or more aspects of personal development, social skills and environmental attitudes.

The study was aimed at curriculum evaluation (viz, groups) rather than individual student evaluation. It has also involved an attempt to improve the thoroughness and precision of methodologies employed by other studies. Consequently, established psychometric instruments (i.e., attitude scales) have been selected for use in this study. Support for their validity and reliability has accumulated through other similar research efforts, and re-established through this study. The data collection also involved subjective techniques such as informal interviews, questionnaires and observations. This information was used to supplement the results from the psychometric tests.

1.3 **OBJECTIVES OF THE STUDY**

The main purpose of the study was to evaluate the outcomes of resident O/E programmes of selected Christchurch Schools. More specifically, I hoped first, to determine the major reasons why local teachers were conducting these types of programmes; second, to identify acceptable evaluation instruments to measure their intended outcomes; and third, to assess these outcomes at the primary, junior secondary and senior secondary education levels.

1.4 **ASSUMPTIONS USED FOR THIS STUDY**

A number of assumptions were made to help me proceed with this inquiry. They are listed below. Where the term "personality constructs" has been used, it is meant to include self concept, social relating skills and attitudes.
(1) Personality constructs can be changed through a short-term resident O/E experience;
(2) these constructs influence behaviour and therefore a change in personality constructs is a worthwhile objective for O/E; and,
(3) a change in personality constructs can be measured.

1.5 LIMITATIONS OF THIS STUDY

The broad nature of this research means that certain important aspects of O/E have been overlooked or superficially treated. It also means that in some areas, precision and detail may be lacking. More specifically, these limitations include the following:

(1) The study was restricted to resident O/E programmes conducted in non-urban natural settings, by a small number of schools;
(2) the experiments were short-term. Assessment occurred over a two to four-week period;
(3) the assessment was limited to personality measures such as self esteem and ability to relate to others, and attitudes such as environmental concern. It did not include the measurement of knowledge, skills or behaviour;
(4) relatively small groups were used. This is especially true for the experiments with lower ability students; and,
(5) a problem was encountered in obtaining relevant literature. Very little information was available from countries other than the United States of America and Australia. The basis of this research is primarily restricted to these sources (a list of sources consulted is contained in Appendix F).

1.6 ORGANISATION OF ENSUING CHAPTERS

This study has been organised into several sections. Chapter 2 discusses the definition and nature of O/E. Chapter three is a literature review of two areas relevant to this research. The first section treats the current status of evaluation and attitude measurement techniques. The second part reviews studies which are directly comparable to this one. Chapter 4 outlines the methods used in this study. The first part describes a survey of local teachers' opinions regarding the outcomes of resident O/E. Following this, is a treatise of the common elements of the experimental approach.
used in the different parts of this investigation. The next chapter (Chapter 5) contains the results of five separate experiments. Each of these is treated as a complete entity for the convenience of teachers wishing to consult a particular experiment. In many instances however, the reader may wish to refer back to Chapter 4 for specific details of the methodology of the individual experiments. Chapter 6 involves the interpretation of the combined results of the preceding chapter. The results are discussed in three sections; a separate discussion for each of the outcome areas is given. Tentative suggestions are made with regard to the improvement and/or development of O/E programmes in general. Conclusions based on the experimental results are then drawn. Comments and suggestions related to the psychometric methodology used in this study are also given. Finally, recommendations for further study are made at the end of this chapter.
"That which can best be learned inside the classroom should be learned there; and that which can best be learned through direct experiences outside the classroom, in contact with native materials and life situations, should be learned there."

These are the words of the chief proponent of outdoor education (L. B. Sharp, 1957, Intro.) and summarizes the philosophy underlying the O/E movement. Because the philosophy is so broad in its nature, O/E has defied simple definition. However, the following definition emphasizes that O/E is more concerned with an educational process rather than with specific content.

"Outdoor education is an instructional strategy which exposes students to environmental settings, ...in an attempt to develop their appreciation and awareness of total life-space phenomena."


Berry (1973, p.15) also considers that the major contribution of outdoor education is that it provides ways of learning. She lists the following characteristics of O/E that distinguish it from classroom experiences:

1. It is a direct experience.
2. It provides discovery, explorations and adventure experiences.
3. It provides sensory learning.
4. The activities are natural to child and youth, and not artificially devised.
5. It creates involvement or intense interest.
6. It is reality.
7. The problems are in context.
8. The learner is active and not passive.
Although the resident outdoor education experience is only one element of outdoor education, it is the one with which this study will be concerned. A "school camp", or simply "a camp", is a term which is used synonymously with "resident outdoor education experience". A camp is a situation in which students are taken to a location where they live in an outdoor setting (in tents or cabins, etc.) for a specific period of time, usually of the order of three days to one week. Generally there are two types of camp curricula - those, which based on an existing school curriculum, bring academic learning into the outdoors, and those that are based on problem-solving activities such as survival. Usually these two elements can be found in any given camp experience although the emphasis is normally on one or the other (Donaldson, 1972, p.2).

Generally, one or more of the following themes are pursued during O/E encampments. They are:

1. Outdoor pursuits;
2. environmental studies; and,
3. personal and social development.

(Hill, 1978, p.6).

Parker and Meldrum (1973, p.156) have defined these themes as follows:

1. **Outdoor pursuits** are aimed at involving young people mentally and physically in activities such as mountaineering, canoeing, etc. It is hoped that new interests and enthusiasms will enable them to examine and understand the natural environment in safety and relative comfort.

2. **Environmental studies** are aimed at creating a better understanding and appreciation of both the potential and problems of the natural environment and to use such areas as forests, etc. for specific study.

3. **Personal and social development** is aimed at offering situations where the participants are dependent on each other and learn to acknowledge this. At the same time it is hoped that campers develop self confidence to cope with practical and intellectual situations.

In figure 2.1 the interrelation of these three O/E themes is schematically illustrated.
FIGURE 2.1  A general interpretation of outdoor education.

(After McConnel, 1979, p.9)
In New Zealand, resident outdoor education is noted principally for its social emphasis (MacKenzie, 1972, p.157). An important influence on O/E in New Zealand which has developed in recent years is the "Outward Bound School" and its underlying philosophy. This philosophy is based on the belief that the self-image of the participants will be enhanced when they are subjected to controlled risk or adventure experiences. The two circles on the top of figure 2.1 would probably best describe the current emphasis in New Zealand O/E residential experiences.

A large number of studies conducted on aspects of outdoor education (e.g., Hammerman, 1973; and Swan et.al, 1978) state objectives that are in accord with the three categories outlined by McConnel (1979) which are illustrated in figure 2.1. These objectives are listed in table 2.1.

<table>
<thead>
<tr>
<th>Theme</th>
<th>Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. OUTDOOR PURSUITS</td>
<td>To learn worthwhile use of leisure time.</td>
</tr>
<tr>
<td></td>
<td>To appreciate the value of recreation.</td>
</tr>
<tr>
<td></td>
<td>To learn about health and safety in the outdoors.</td>
</tr>
<tr>
<td>2. ENVIRONMENTAL STUDIES</td>
<td>To learn the principles of conservation.</td>
</tr>
<tr>
<td></td>
<td>To appreciate the outdoors.</td>
</tr>
<tr>
<td></td>
<td>To learn about ecological relationships.</td>
</tr>
<tr>
<td>3. SOCIAL AND PERSONAL DEVELOPMENT</td>
<td>To experience aspects of group living and group cohesiveness.</td>
</tr>
<tr>
<td></td>
<td>To develop a positive attitude toward people.</td>
</tr>
<tr>
<td></td>
<td>To develop self-reliance and self-respect.</td>
</tr>
<tr>
<td></td>
<td>To be exposed to a wider range of life's experiences.</td>
</tr>
<tr>
<td></td>
<td>To develop a better rapport between teachers and students.</td>
</tr>
<tr>
<td></td>
<td>To improve relationships between class members.</td>
</tr>
</tbody>
</table>
High expectations are held of outdoor education by those involved in its implementation. One speaker at an international conference on outdoor education in 1972 (Wipper et al., 1973, p.55) said,

This (the resident outdoor school) is one of the most sensational and effective forms of outdoor education . . . ."

The educational value of the school camp has been widely accepted and this has resulted in an enormous increase of activity in resident outdoor education programmes at both the primary and secondary levels (MacKenzie, 1976, p.155; Clark, 1977, p.6). Yet it would appear that the extent to which many of the O/E objectives are being met by current O/E programmes has not been adequately determined. Roth (1976, p.36) points this out in his summary of evaluation of O/E programmes.

"Application of available technique and research methodology (in programme evaluation and attitude assessment) to many camp programmes does not appear to be common practice".

The aim of this research then will be to apply some of the available attitude assessment techniques in an attempt to evaluate various camp programmes in New Zealand.

Summary

The most commonly stated objectives for outdoor education are personal development (i.e. related to human character) and social development (i.e. related to human relationships), environmental studies and outdoor pursuits. One of the most difficult of these components to measure is the attitude component. Attitudes can be measured, but a careful choice of assessment tools is necessary. Some of the more important factors involved with attitude measurement will be considered in the next chapter.
CHAPTER 3

LITERATURE REVIEW

ORGANISATION OF LITERATURE REVIEW

This chapter is divided into two sections. In the first section, literature concerned with techniques and problems of educational evaluation and attitude measurement is reviewed. The second part is a critical discussion of studies assessing outcomes of resident O/E experiences. Research undertaken before 1970 is discussed separately from that published after 1970. The later studies are treated in greater depth than their predecessors for two reasons: first, they appear to be more methodologically sound; and second, either they examine a broader range of outcomes or they have been conducted in New Zealand and are thus more relevant to the present investigation.

3.1 EVALUATION AND ATTITUDE MEASUREMENT TECHNIQUES

3.1.1 Evaluation Techniques

Bennet (1977, p.193-211) describes some of the problems of evaluating student learning. He stresses the value of evaluation as a continual process rather than one which occurs only at the end of a programme. A useful summary of the evaluation research process is given at the end of his text. Doran (1975, p.50-63) also considers the "state of the art" of evaluation. Although both of the above authors consider measurement and evaluation in relation to environmental education objectives, their work is equally applicable to the realm of outdoor education. The reader is referred to the above two researchers for a detailed discussion of the principles of educational evaluation in the context of environmental and outdoor education.

The evaluation process involves comparing a programme's outcomes with the goals and objectives which were established initially to meet identified needs. As was demonstrated in table 2.1, many of the objectives of outdoor education are of an affective or attitudinal nature (e.g. objectives concerned with changing attitudes toward the self, others and the natural environment). Therefore the assessment of attitudes or even the measurement of actual behaviour cannot be ignored in O/E programme evaluation.
3.1.2 Attitude Measurement Techniques

An attitude is a psychological variable that, "... entails an existing predisposition to respond to social objects which, in interaction with situational and other disposition variables, guides and directs the overt behaviour of the individual". (Cardno, 1955). Thurstone, Likert and Guttman are names that are frequently associated with attitude measurement. They are the originators of the most common means of measuring attitudes, the attitude scale. An attitude scale is formed by inviting respondents to indicate their agreement or disagreement with a set of statements about an attitude object (Shaw and Wright, 1967, p.13-15). Shaw and Wright devote an entire book to the description of scales to measure different attitudes.

Triandis (1971 p.26-59) describes and critically compares the major verbal (i.e. pen and paper) attitude instruments. Oskamp (1977, p.37-41) reviews the major attitude scaling techniques and discusses problems affecting their "validity" (i.e. the degree to which the scale measures what it is supposed to measure). One of the problems associated with attitude measurement is that there are frequently sources of invalidity involved (Campbell and Fiske, 1959, p.81-105). Since validity and reliability are two terms commonly used to describe the usefulness of a test, they deserve some discussion in this review.

Both reliability and validity require demonstration of agreement between measures. Campbell and Fiske (1959, p.223) give a comprehensive definition of the two terms:

"Reliability is the agreement between two efforts to measure the same trait through maximally similar methods ... validity is represented in the agreement between two attempts to measure the same trait through maximally different methods ..."

Thus the two terms can be viewed on a continuum with validity at one extreme and reliability at the other. Methods for determining validity and reliability are described by Shaw and Wright (1967, p.16-20).
problems of Attitude Measurement:

The term "response set" or "halo effect" has been used to describe one common source of invalidity. According to Oskamp (1977, p.37), response sets are: "systematic ways of answering which are not directly related to the question content, but which represent typical behavioural characteristics of the respondents". For example, the subject may wish to appear enlightened or to give a good impression to the investigator. The most prevalent types of response sets and ways of overcoming them are discussed by Oskamp (ibid), Triandis (1971, p.55-57) and Anastasi (1976, p.515-521). Their comments are summarized below.

"Social desirability" or "faking good or bad" is one type of response set. This may be increasingly apparent in the measurement of environmental attitudes because of wide media coverage of environmental issues (Born and Wisters, 1978, p.41). People believe that they should be concerned and therefore indicate "appropriate" attitudes when asked to respond on an attitude scale. This tendency to "fake good or bad" may also be evident in personality measures such as self concept.

There are a number of ways of reducing the "halo effect" although none of the known solutions have been proven to be entirely satisfactory. Oskamp (1977, p.41) lists the following solutions:

1. use items where social desirability does not appear to be an issue;
2. stress to respondents that there is no right or wrong answer;
3. stress to respondents that honesty is important;
4. provide anonymity for the respondents;
5. use personality scales in conjunction with attitude scale to identify those who are likely to be "dishonest";
6. use forced-choice technique where two items of approximately equal social desirability are paired together and the respondent must pick one; and,
7. use unobtrusive measures of behaviour (observations made without attracting the person's attention (Oskamp, 1977, p.41)) or indirect methods (intentions of experimenter are disguised (Triandis, 1971, p.55)) in conjunction with verbal attitude scales.
A second common type of response set is "acquiescence" or "yea-or nay-saying", where the respondent tends to always agree or disagree with the items being measured. This problem can largely be eliminated by using a balanced scale, (Oskamp, 1977), p.40). One half of the items on the scale are scored if the answer is "true" and the other half are scored if the answer is "false". This simply requires reversing the wording of items.

"Extremity of response" is another problem. In this case, the subject always uses the extremes of the scale (e.g. very positive or very negative). This can only occur when there are greater than two alternative answers. The solution to this problem is to provide an equal number of items that are keyed in a positive direction as there are in a negative direction. Another remedy is to provide only two alternatives (e.g. Yes - No).

Finally, there is the problem of carelessness or lack of motivation on the part of the respondents. Answers may be variable or inconsistent. Researchers can minimize this by building up a good rapport with the subjects and stressing the importance of the task. Usually a carelessly answered response sheet can be identified and removed from the analysis.

Despite the aforementioned problems of attitude measurement, it is widely believed that attitudes can be quantified. If the appraisal instruments are chosen or constructed carefully, and the researcher attains a good rapport with his subjects, then all of these problems can be at least partially overcome, (ibid, p.40).

For the remainder of this chapter, research on the assessment of outcomes of resident outdoor experiences is reviewed.

3.2 REVIEW OF RELATED RESEARCH STUDIES

Studies of the outcomes of resident outdoor education programmes first appeared in the literature in the United States in the early 1950's. Evaluation of "camps" originally focused on the attainment of social and personal development objectives. More specifically, the most frequently studied outcomes of O/E were changes in self concept and development of social skills. (Self concept has been defined as "... a complex and dynamic system of belief which an individual holds true about himself ..." (Purkey, 1970, p.7).
Both early and more recent studies aiming at measuring changes in these two areas have most often been conducted on sample populations of 10 to 12 year old children (e.g. Kranzer, 1958; Duke, 1968; Kopp and Barnes, 1971; Carlson, 1973; Williams, 1975; and Hill, 1978). This is regarded as the age at which self concept in particular, is most readily changed, (Williams, 1975, p.22).

Objectives related to environmental studies began to be assessed in the mid 1960's. Most of this research centred on the 9 to 12 year old child (e.g. Jensen, 1965, Millward, 1973, Williams, 1975).

3.2.1 Pre 1970 Studies

Early studies employed questionnaires and surveys as a means of evaluating whether objectives of school camps were being achieved. Roth (1972 p.35-36) reviewed seven of these earlier research efforts, and all of these concluded that outdoor camping was of some value to both children and teachers. A short description of these and other studies can also be found in Hammerman (1973). Some of these studies are briefly outlined below.

Cragg (1953) and Johnson (1957) were among the first to employ a battery of objective techniques to measure camp outcomes on a pre-post basis (i.e. tests were administered both before camp and after camp). Among others, they used (1) a self-rating activity checklist of pupils' interests (appropriate adjectives concerning a variety of interests are ticked on a checklist); (2) a peer-rating guess-who questionnaire (children are given a number of brief "word pictures" and are instructed to write under each, the name of every classmate who might fit the description) (Anastasi, 1976, p.612-613); and (3) a sociometric questionnaire (similar to the peer-rating instrument).

Cragg (1953) reported that the O/E experience contributed to the educational development of the child. However, she did not say in what sense this was the case (Hammerman, 1973, p.108). In Johnson's study significant changes in "group cohesiveness" (i.e. increased group attractiveness for its members) were found, but only a few small changes in pupils' interests and peer relationships were observed.

Kranzer's study (1958) investigated behavioural changes occurring as a result of a five-day outdoor experience. This experience was compared with that of a regular classroom. An impressive variety of tools was used to measure social, emotional, intellectual, physical and democratic group living
outcomes. He concluded that social and democratic behavioural changes took place more rapidly in the outdoor learning situation, (Roth, 1973, p.30). No statistically significant gains in self concept were found, (Berry, 1973, p.16).

Four other studies reviewed by Roth all report gains in the social and personal development of school camp participants. These investigations however, are deficient in methodology and do not contribute to research in O/E evaluation.

Hill, (1978, p. 25) reviewed 11 studies dealing specifically with changes in self concept as a result of O/E. These investigations were conducted between 1959 and 1971. He too points out deficiencies in the research methodology. One or more of the following weaknesses were found:

1. deficiency in the selection of subjects;
2. dubious validity of the appraisal technique;
3. Sensitization due to pretesting;
4. coarse scaling (unequal intervals) of the instrument;
5. no control group; and,
6. competition in the programme creating a need to appear "good" on the instrument.

Of the four studies using published self concept instruments that Hill reviewed, one (Koocher, 1971) concluded that changes in self esteem were a momentary "aura" induced by learning to swim during camp. Another, Duke (1968) used the Piers-Harris Self Concept Scale with children attending a one-week camp. He found no statistically significant difference between the control and experimental groups, although a positive trend was noted for the campers.

Alexander (1969) used the Tennessee Self Concept Scale and found positive shifts in both the experimental and control groups. This suggests that the change may have been due to the influence of pretesting.

Kopp and Barnes (1971) used the Coopersmith Self Esteem Inventory as well as other self-report measures devised by the authors. The results of the Coopersmith scale proved to be inconclusive. One third of the boys on camp improved their self concept scores (none of the girls did), but one fifth of the boys showed a statistically significant negative change. Positive trends were reported in social skill development as measured by the author-
devised questionnaires and scales. However, since no evidence of the validity of the latter tools was given and no control group was used, the findings on both self concept and social skills are doubtful.

Prior to 1970, few studies on environmental attitude outcomes were undertaken. The emphasis was rather on the cognitive or knowledge aspect of environmental studies. For example, Hollenbeck (1958) recommends school camping as a method of enhancing science - learning as a result of her evaluation study. Further details of her study are not available in New Zealand.

Johnson's evaluation study (1957) found no specific results related to changes in conservation behaviour traits.

Jensen's study (1965) was one of the first to use a psychometric attitude measurement technique (a Likert attitude scale) to evaluate attitudes toward "experiences indigenous to the natural environment". Although the author reported a positive change in the student's attitudes, both the control and experimental group gained in their scores. In an earlier study by the same researcher (Jensen, 1963), students' attitude scores toward the natural environment were significantly more negative after the camp experience, Millward, (1973, p.36).

Again it would be difficult to conclude that these results can be used to support the claims of present outdoor educators that O/E enhances students' appreciation of the natural environment.

**Summary of Pre 1970 Evaluation Studies**

Full details of most of the early evaluation efforts are not available in New Zealand and this hampers a critical assessment of them. Of studies employing reasonably valid and reliable measuring devices, only a few have demonstrated positive gains in personal and social development. In some cases, the resident O/E experience may have improved group cohesiveness and relationships amongst classmates. None of the studies that can be considered reliable and valid conclusively cite positive changes in self concept. Consequently, no conclusions can be drawn from the pre 1970 era studies about the potential of the O/E experience to produce changes in environmental attitudes or self concept.
3.2.2 Post 1970 Evaluation Studies

After 1970, a number of studies focused on the development of instruments that would measure with an acceptable degree of reliability and validity, the outcomes of O/E experiences. Scales were developed to measure changes in environmental attitudes as well as the more traditional social and personal development. Six studies that evaluate changes in some or all of these areas will be described in this section. The latter three are recent New Zealand studies. The six studies represent investigations that most closely parallel the objectives pursued in this study.

Carlson, 1973

Carlson used a pre-post non-equivalent control design (i.e. control group children were not explicitly matched with the experimental group subjects) with intermediate school level children. The experimental group participated in a five-day mid-winter resident programme. The approach used was multi-disciplinary; biology, ecology, mathematics, arts, health and other activities were undertaken. The overall aim of the experience was to develop an awareness and appreciation of natural resources.

The control group (two other classes) underwent a regular classroom programme covering similar subject matter.

The appraisal instruments (i.e. tools used for attitude assessment) were designed after careful consideration of the activities that the students would be engaged in. According to Carlson, content validity (i.e. do the items adequately represent the behaviour domain to be assessed?) was judged by "experts" and found to be acceptable.

Children's "perceptions of peers" were measured using a peer-rating guess-who questionnaire. Students were asked to nominate the children with whom they would like to work or play. No significant differences were found in children's perceptions of peers between or within groups.

A "selected outdoor picture" instrument was used to determine a shift in the number of word concepts, and a semantic differential (see explanation below) was used to measure attitudinal changes toward the following five concepts:
(1) wild animals;  
(2) woods (forest);  
(3) water;  
(4) wild birds; and,  
(5) solid waste (pollution).

The author devised both instruments and used photographic slides to portray these concepts.

On the semantic differential each concept was rated according to a series of bipolar adjectives. These adjectives were grouped together to form three factors - the evaluative, potency and activity factors. Refer to Osgood (1957) for complete details on the theory and construction of the semantic differential instrument.

No significant differences were found between groups on any of the fifteen possible concept combinations (i.e. five concepts on three factors) on either of the two instruments.

Although the author makes several explanations for her failure to demonstrate positive outcomes, it is doubtful whether the outdoor programme was very different from the control group's experience. Only one concept, awareness of wild birds, changed in a positive direction for both groups, indicating that perhaps neither the classroom nor the outdoor approach was successful in changing outdoor attitude or peer relationships.

Millward (1973)

The purpose of Millward's research was to examine the effects of two different outdoor teaching methods on the outdoor attitude of 11 to 12 year old students.

Three hundred students were involved in this study. Half were randomly assigned to a control treatment and half to the experimental treatment but both groups attended the same camp. The control group camp leaders were trained by a teacher who had considerable outdoor experience. The experimental group camp leaders were taught by Millward in outdoor teaching strategies and attitude theory. The main difference between group treatments was that the experimental group was to experience a pedagogy that was designed especially for the outdoors.
Activities for both groups included recreation, social studies, plant and animal study, arts, and mathematics.

Millward designed a 43 item, five-point Likert scale based on specific objectives set out for the experiences under examination. The scale was developed from other published conservation attitude scales and modified after several pilot studies. Reliability (test-retest and internal consistency, i.e., the first tests for stability of items with time and the other tests for homogeneity of items) was determined for each item and items not demonstrating satisfactory levels on either of these points, were discarded.

Four final subscales were devised, giving rise to five scores: a total score and a score on each of the education, pollution (environmental degradation), socialization and environment subscales. The final scale was named the Millward-Ginter Outdoor Attitude Inventory (abbreviated MGOAI), and is one of the instruments selected for use in this study. Two slightly different but parallel forms were used in his study and alternately given one week prior to, and one week after the camp and again three months later.

Both groups gained significantly on the total outdoor attitude score and on the "environment" and "socialization" subscores. However, there was no difference between control and experimental groups. The author hypothesized that teachers did not apply the new outdoor teaching strategy that they had been taught, and that in consequence the two groups received essentially the same treatment. Previous studies, undertaken by Millward in 1971 and Porterfield in 1972 also found gains but on different subscales of the MGOAI or its predecessor. The results that Millward found in the later (1973) study then, might have been due to more than just a pretesting influence.

On Millward's environment subscale, it was found that the children responded more positively to statements about animals in particular. On the majority of the other items related to environmental concepts however, the children had mean positive scores both before and after the camp, and these items did not show any change.

Students' attitudes toward the pollution and outdoor educational (education subscale) concepts were also very positive before and after the camp and only one item showed a significant change; it was that students tended to disagree more with the statement "My class alone cannot do much to improve the environment".
On the socialization subscale, scores on four statements increased significantly. The camp participants were less concerned about undressing in front of tent-mates, and found it easier than expected to make new friends during mealtime and to agree with classmates when planning activities together. They also showed a more positive attitude toward working with the teacher in the outdoors.

Scores on the education subscale indicated that the experience was not as much fun as anticipated. The posttest scores of four statements about learning in the outdoors, liking nature books etc. decreased significantly.

Millward examined the effect of the camp on girls versus boys and on above average grade students versus below average grade students. There were no differences between sexes on any of the scores but there was a significant difference between students of lower and upper academic standing. The upper group scored higher on many of the outdoor concepts. The author hypothesized that either these "better" students were demonstrating "response set" (i.e. "faking good") or that the camp catered only to the above average grade student.

Millward concluded that the resident camp did seem to have a positive effect on the students' attitudes toward certain outdoor concepts. However, the fact that his treatment with the experimental group was essentially no different than that with the control group, means his findings must be interpreted with caution. In addition the problems of "social desirability" and "anticipation" (i.e. children expect the camp to be enjoyable) were evident in his results.

Millward's study is nonetheless, an important one in the assessment of O/E programmes. First, he attempted to create an evaluation tool that covered the breadth of expected outcomes of these types of experiences, and he partially succeeded. He did not include character development (e.g. self concept, confidence, maturity) in his scale, but he did cover many of the other commonly cited O/E objectives. In addition his scale included some items that could be attributed to environmental education (e.g. concern and motivation to work toward a cleaner environment can be considered to be environmental education objectives).
And second, Millward recognized that O/E could achieve more (in terms of outcomes) if a pedagogy specially designed for changing attitudes was applied to O/E programmes. He notes his failure however to achieve this; "...[there was] little evidence to suggest that teachers encouraged exploration or problem-solving activities during camp ...". He found rather, that the teaching approach used on camp was basically lecture-recitation.

Williams (1975)

Williams studied the effects of a five-day camp programme on the self concept and environmental attitudes of 161 intermediate school children. Two groups were studied. The experimental group attended a NEED (i.e. National Environmental Education Development) camp in Tennessee, U.S.A. NEED is a programme which has been developed according to sound curriculum development procedures and is being continually revised. Williams was the first researcher to formally evaluate the programme however.

The NEED programme is environmentally-oriented and developed around five "strands" or themes. These are:

1. variety and similarity;
2. patterns;
3. interaction and interdependence;
4. continuity and change; and,
5. adaptation and evolution.

Most of the experimental group teachers had previously attended this NEED camp as leaders or had attended an in-service course there. The students were exposed to environmental education concepts before the camp (NEED provides curriculum-integrating materials for pre and post camp work in the classroom).

The control group attended a recreation-oriented YMCA/YWCA camp, and they had no environmental education preparatory work.

A Solomon Four-Group research design was used, in which only one half of the students of each group were pretested but all of the students were posttested. This design allowed the main effects (i.e. history, maturation and testing) and the interaction effects between testing and the treatment to be determined. This design is considered to account for more sources of invalidity that most other designs that are practically applicable in educational research (Campbell and Stanley, 1966, p.8, 34).
The main aim of Williams' study was to assess the effect of the NEED programme on environmental attitudes. He hypothesized, however, that an attitude change of this type might trigger varied self concept reactions. In order to investigate changes in either environmental attitude or self concept, and any possible relationship between them, Williams used two psychometric scales that involved the use of photographic slides.

Self concept was measured using a well researched instrument (the Missouri Children's Picture Scale - MCPS). This non-verbal tool had been used in at least 15 other investigations and found to be sufficiently valid.

Of the eight different components of the self concept scale, Williams found that the experimental group showed a significant change on the masculinity-femininity and the hyperactivity scales. That is, the students exhibited more masculine tendencies and displayed less hyperactive behaviour at the end of the camp. Other tendencies exhibited by this group were a greater degree of maturity and a greater inhibition. On the other hand, the group which attended the YMCA/YWCA camp demonstrated greater concern about their physical well being. None of these changes were found to be statistically significant however, when the score changes of the experimental group and control group were compared.

To measure environmental attitudes, the author constructed his own measuring device, a 100 picture-slide scaling tool which he called the Environmental Preference Test (EPT). Children were shown slides and were asked to classify the scenes as (1) good or bad and (2) whether scenes were detrimental to, or preservative, of the environment. One final score would be used to indicate the children's environmental attitudes. The slides were of both natural and man-modified scenes and included development, litter, urban environment, animal predation, vegetation and the desert. No "neutral" scenes such as farm land or artificial vegetation were included. Williams gave sufficient evidence that the reliability and validity of this scale were adequate for his research purposes.

On the EPT, the experimental group's gain of score was significantly different from the control group's change of score at the 0.01 probability level, representing a 5% difference in scores. Correlations at the 0.05 probability level were found between the EPT scores and the scores on the inhibition, masculinity-femininity, conformity and sleep disturbance sub-scales of the MCPS.
The results of Williams' study are thought provoking. His findings were based on a sound research design and adequately validated appraisal instruments. In this researcher's opinion, no other study has demonstrated so convincingly that an O/E camp can change environmental attitudes of the participants involved. Nonetheless, the gains were relatively small.

The programme evolved with specific objectives in mind and the teachers and students were well prepared before camp. Williams' results suggest that these features of the particular NEED programme were largely responsible for changing environmental orientations of the NEED participants.

New Zealand Studies (1976 - 1979)

Clark (1976)

Clark's study (1976, p.49-54) was the first published New Zealand study dealing with a broad range of outcome areas in O/E. He examined three different types of school camps with a view to answering whether or not objectives were met. Unfortunately, Clark used a "one shot case study approach" (Popham, 1975, p.206) and his assessment can only be used as a rough indicator of what students report as outcomes of a resident O/E experience.

To assess the social and recreational value of a Form II (ages 12-13) camp, Clark used a post-camp only self-report device asking students to list the good and bad points of the camp. The only result reported was that the boys enjoyed the adventurous activities while the girls best remembered the "socialization" activities.

A Form III (ages 13-14) camp with the primary objective of social integration was assessed with a post-camp only sociometric-type questionnaire. Over 80% of the students, reported an increase in the number of friends they had after camp.

On a girls' Form VI weekend biology trip Clark found no conclusive trends in the class or teacher/pupil relationships or in the students' attitudes toward water conservation, conservation in general or the geographic location of the camp. Only one question was asked to assess each of the last three attitudes.
Bate (1979)

Bate, a Christchurch high school teacher evaluated his Form III (ages 13-14) O/E programme which was conducted in a mountain environment over a three-day period. He nominated five specific objectives for pursuit. These were:

1. Social and personal development;
2. Teacher/student relationships;
3. Knowledge of leisure activities;
4. Valuing the natural environment; and,
5. Skills for coping with the tasks of camping and tramping.

He used several pre-post self-developed questionnaires and "situational tests" to assess these possible outcomes.

Bate reported no significant differences in class spirit (the pretest score was already high). An increase in the number of friends of the upper academic ability group but a decrease in the lower academic ability group's friendships was found. The students regard for their teacher showed a significant gain when compared with the responses of a control group. Two thirds of the experimental group as opposed to one fifth of the control group reported knowing their teacher better on the posttest.

A significant increase in some outdoor skills was observed. "Knowledge of leisure activities" was not measured on the basis of the assumption that "... (this) objective would be achieved simply by taking students on the outdoor camp", (Bate, 1970, p.6). "Valuing the natural environment" was an objective to be achieved by making students aware of "rules" or a "code of ethics" to conserve areas suited to tramping. Although the students all reported a high awareness of the necessity of rules, few could list any rules either before or after the camp. Almost two thirds of the specific tramping and camping skills set out to be learned were mastered by the participants. 40 to 50% of the students showed a significant positive change in their reported confidence and ability to select equipment, avoid exposure, cross rivers and pitch a tent.

Although this study was an admirable attempt at evaluating outcomes related to well formulated objectives, the appraisal devices used to measure social skills and respect for the natural environment were of doubtful validity and reliability. In most cases no comparison (i.e. control) groups were used.
Another shortcoming of Bate's study is that certain questionable assumptions regarding some of the outcomes of the camp were implicitly made. For example he implied that a knowledge of leisure activities necessarily leads to an enjoyment and appreciation of them. The possibility of a student having a more negative attitude toward outdoor recreation as a result of the camp was not even considered.

It is also significant that students reported caring for the environment before the camp but they did not remember rules regarding the care of wilderness areas. It could also be pointed out that the measurement of "valuing the natural environment" was very limited. Aspects that were not included in "valuing the natural environment" were concern for the legal protection of wilderness, enjoyment of the outdoors, and satisfaction of doing things outdoors.

Bate did not attempt to measure any outcomes related to personal development.

Hill (1978)

Hill (1978) studied the effect of a 10 day resident outdoor education experience on the self concept of Form I (ages 11-12 years) students. This appears to be the first attempt to evaluate an outcome of O/E in New Zealand using an accepted psychometric tool.

The author used the Soares and Soares Self Perception Inventory (SPI). It measures five separate but interrelated areas of self concept: (1) general self concept; (2) ideal self concept; (3) reflected self concept; (4) reflected self-classmates; and, (5) reflected self-teacher. Test-retest reliability \( r_{tt} \) was calculated by correlating scores on the same test (given at two different times) and was found to be 0.88. This was almost high enough to warrant using the scale for measuring individual changes in self concept. Few validity studies of this scale are available but in the Eighth Mental Measurements Yearbook, one reviewer Shepard, (1978) considers it to be adequate for research purposes.

The five parts of this self concept inventory were administered to 148 students in an Auckland intermediate school using a Solomon Four-Group design (introduced earlier). The pre and posttests were given two days prior to and two days following a 10 day period spent at an outdoor education centre.
Camping, bushcraft (i.e. camping skills) and recreational activities including orienteering, native forest nature study, roping, etc. were undertaken during this time. A multiple analysis of covariance revealed no significant changes in any of the five components of self concept as a result of the camp experience. Pretesting did have a significant effect. Scores on the SPI were generally positive and therefore reduced the possibility of obtaining a significant change at the group level. The average score was 75%. This positive skewing is commonly found on self report inventories.

Hill suggested that the self concept of certain individual students may have changed. However, both gains and losses in self concept were noted. Hill did not attempt an explanation of these discrepancies among students, (his research was curriculum or group oriented) but concluded that "... further research is needed to isolate the cause of these (individual) changes ... although it seems doubtful that substantial changes in self concept, as a result of a 10 day resident O/E experience would be likely", (p.53).

Since his study is unique in the area of O/E evaluation in New Zealand, the findings are of considerable significance to this study. Hill's study represents a well executed experiment that employs a measurement tool of apparently adequate validity. Unfortunately he did not report in detail on the objectives and content of the O/E experience or the teaching approach used during the camp programme itself. Furthermore, information concerning the numbers of the individual changes in self concept that were significant, was not given.

One is left with the impression that the author did not attend the camp himself, thereby decreasing his ability to "validate" the findings of his experiment through personal observation. In addition, he did not use any other appraisal methods to substantiate his findings.

Hill's investigation is also very limited in terms of the whole realm of evaluation in outdoor education; he examined one age level at one school for one possible O/E outcome. Although he discussed environmental education and its relationship to outdoor education in his literature review, his study made no attempt to measure or observe students' attitudes toward the environment.
3.3 SUMMARY AND CONCLUSIONS OF THE LITERATURE REVIEW

It is evident from this review of what is now a very extensive literature that the assessment of O/E outcomes, and the manner in which research on this subject is reported, leave much to be desired. However, a number of points emerge from this discussion. First, self concept and environmental attitudes appear difficult to change. Self concept is known to be a stable construct, which has been reported to change in short periods through careful devising of the physical environment and human groups. The approach must be varied to cater to the response of different individuals to learning format (Keating, 1978, p.33).

Measurement of changes in environmental attitude is difficult because of "response sets", (i.e. when students report to possess a positive environmental attitude even prior to any outdoor education experience). Generally, evaluation research indicates that gains measured in these areas are less than teachers judge them to be.

The second point is that social skill objectives may be more successfully achieved, especially in the area of peer relationships with children that do not previously know each other well. Group cohesiveness also seems to improve as a result of many types of camp experiences.

The third point to emerge involves the probable importance of an appropriate teaching strategy for the outdoors. Williams' (1975) study, in particular, demonstrates that a programme developed in accord with well researched curriculum development rules (refer to Bennett, 1977) will produce some measurable gains. Positive changes in both self concept and environmental attitudes, the two attitude constructs which have not appeared to change in most other studies, did improve as a result of a carefully constructed O/E experience, (i.e. the NEED programme).

The fourth point, one of some importance, involves the different effect of the O/E experience on the lower ability student in comparison to the above average student. Both Millward (1973) and Bate (1979) found that the lower ability students either did not change or became more negative in relating to the teacher and classmates. This again raises the issue of an appropriate pedagogy for the outdoors. Failure to do so may actually create negative educational outcomes in some students.
The fifth point to emerge from this study is that the New Zealand education system has built an extensive programme of outdoor education based on little formal evaluation of outcomes. One study reported success in improving peer relationships at the Form III (ages 13-14) level and another study in teaching bushcraft skills. No success in the area of changing self concept or environmental attitudes has been formally reported. Indeed, investigation of environmental attitude outcomes has until the present been totally ignored in New Zealand studies.
CHAPTER 4

METHODS

ORGANISATION OF METHODS

This study was conceived as an exercise in curriculum evaluation. Its intention was, first, to identify teachers' educational objectives and methods for O/E, and second, to assess the extent to which those objectives were being met. The first part of this chapter describes a survey which was used to determine local teachers' general expectations of O/E. The second part describes the assessment techniques used to determine the outcomes of selected school camp programmes.

4.1 TEACHER QUESTIONNAIRE - SURVEY

The first part of this investigation involved a survey of teachers' opinions regarding the outcomes of O/E programmes. A list of expected outcomes was prepared after consultation with a group of experienced local O/E teachers and administrators, and subsequently used in one of four questionnaires (refer to Appendix A) dealing with school O/E programmes. These questionnaires were developed in conjunction with two other students studying aspects of O/E. For this particular study questionnaires 1 and 3 were used. Throughout the questionnaire development period, teachers expressed interest and offered their co-operation with the survey.

Distribution of the Questionnaire

The survey was mailed in October 1979, to all those Christchurch school teachers who were currently undertaking O/E camp programmes. More than 140 teachers were contacted in 123 schools. A list of the participating schools is given in Appendix A. Table 4.1 lists the numbers of participating teachers and schools from Christchurch and the surrounding suburbs. An 80% return rate from the schools and a 75% return rate from the teachers was attained.
TABLE 4.1 Number of Participating Schools and Teachers in Survey of Expected Outcomes of Resident Outdoor Education

<table>
<thead>
<tr>
<th>Category</th>
<th>Primary</th>
<th>% Return</th>
<th>Intermediate</th>
<th>% Return</th>
<th>Secondary</th>
<th>% Return</th>
<th>Total Returned/Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Schools participating</td>
<td>56</td>
<td>79</td>
<td>20</td>
<td>87</td>
<td>24</td>
<td>83</td>
<td>100</td>
</tr>
<tr>
<td>Number of Teachers participating</td>
<td>58</td>
<td>73</td>
<td>20</td>
<td>83</td>
<td>33</td>
<td>75</td>
<td>111</td>
</tr>
<tr>
<td>Number of Surveys used in the analysis</td>
<td>45</td>
<td>18</td>
<td></td>
<td>27</td>
<td></td>
<td></td>
<td>80</td>
</tr>
</tbody>
</table>
Results of the Survey

The survey results are summarized in Table 4.2 and are graphically illustrated in Figure 4.1. The list of outcomes were regrouped into four categories (viz., personal, social, recreational skills and environmental) in this figure to demonstrate the relative importance given by teachers to each of these four areas. From the analysis of the survey, it appears that teachers considered outcomes and objectives of O/E to be synonomous. When referring to results therefore, the two terms will be used interchangeably.

As can be seen from Figure 4.1 the difference between rankings of the primary, intermediate and secondary teachers was minimal. They all seem to agree on the objectives of O/E. "Exposure to a wider range of experiences" (No. 1) was considered to be the most likely outcome, closely followed by "improved relationships with other class members" (No. 5). Teachers also unanimously agreed that "learning to enjoy wilderness experiences, (No.12) was an important consequence of resident O/E. "Improved self concept" (No. 3), "increased confidence and maturity" (No. 4) and "ability to work as a team member" (No. 7) attained almost the same average weighting, but were ranked lower than the three previously mentioned outcomes. "Improved relationships with teachers" (No. 6) did not reach the same level of concensus from teachers as most of the other outcomes, i.e., rankings were scattered widely throughout the range from 1 to 12 rather than being concentrated near the mean rank. This lack of agreement among teachers was also noted for "ability to work as a team member" (i.e., group cohesiveness).

Specific outcomes relating to conservation, natural science knowledge and learning physical skills and fitness were generally given less weight than the personal and social development outcomes. This is in accord with previous reports on New Zealand outdoor education. "Greater knowledge of nature study, ecology etc." was inferred by some teachers to mean greater knowledge of academic subjects in general and received a wide range of responses.

Improvement of badly-behaved students appeared to be unimportant to most of the survey respondents. In talking with some teachers, I was told that while the behaviour of these children improves on camp, once back in the classroom situation their behaviour reverts back to normal or becomes even more disruptive.
<table>
<thead>
<tr>
<th>No.</th>
<th>OUTCOME</th>
<th>PRIMARY (n=45)</th>
<th>INTERMEDIATE (n=18)</th>
<th>SECONDARY (n=27)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>exposure to a wider range of experiences</td>
<td>8.7</td>
<td>9.3</td>
<td>8.2</td>
</tr>
<tr>
<td>2</td>
<td>improved behaviour of badly behaved students</td>
<td>1.8</td>
<td>2.3</td>
<td>2.0</td>
</tr>
<tr>
<td>3</td>
<td>improved self concept</td>
<td>6.6</td>
<td>7.7</td>
<td>6.9</td>
</tr>
<tr>
<td>4</td>
<td>increased confidence and maturity</td>
<td>6.0</td>
<td>6.6</td>
<td>6.7</td>
</tr>
<tr>
<td>5</td>
<td>improved relationships with other class members</td>
<td>8.6</td>
<td>8.6</td>
<td>8.2</td>
</tr>
<tr>
<td>6</td>
<td>improved relationships with teachers</td>
<td>5.0</td>
<td>4.9</td>
<td>5.4</td>
</tr>
<tr>
<td>7</td>
<td>ability to work as a team member</td>
<td>6.3</td>
<td>6.4</td>
<td>6.3</td>
</tr>
<tr>
<td>8</td>
<td>learning possible leisure time activities</td>
<td>3.8</td>
<td>4.1</td>
<td>3.7</td>
</tr>
<tr>
<td>9</td>
<td>improved fitness and physical skills</td>
<td>2.8</td>
<td>3.7</td>
<td>2.7</td>
</tr>
<tr>
<td>10</td>
<td>greater knowledge of ecology, nature study, etc.</td>
<td>5.4</td>
<td>3.9</td>
<td>5.2</td>
</tr>
<tr>
<td>11</td>
<td>demonstrating conservation behaviour</td>
<td>3.3</td>
<td>2.2</td>
<td>4.5</td>
</tr>
<tr>
<td>12</td>
<td>learning to enjoy wilderness experiences</td>
<td>7.2</td>
<td>7.7</td>
<td>6.9</td>
</tr>
</tbody>
</table>

* n = sample size on which mean ranks were based.
FIGURE 4.1 Rankings of intended outcomes of resident O/E experiences by Christchurch teachers.
In addition to these results, one of the questionnaires revealed the following pattern for O/E programmes as they are currently implemented by Christchurch schools.

**Standard IV**

Resident O/E experiences generally commence at Standard IV (age 10 years). The emphasis is on the development of self and independence from the family. Cabins or hut accommodation with modern facilities is usually preferred over tenting. Many of the activities are academically-oriented. Introductory and follow-up events and discussions are normally practiced in the classroom with primary school children attending camps.

**Intermediate** (Form I and II)

Form I and II (age 11-12 years) camps also emphasize personal development as an objective. Both academic and recreational activities are carried out. Tenting is common although modern cooking and washing facilities are usually on site.

**Secondary** (Form III to IV)

Form III (age 13 years) students are taken out in large groups (i.e. several classes) mainly as a social experience. The camps are loosely structured. Tenting and bushcraft skills are an integral part of the programme.

Form IV (age 14 years) camps are the peak of most secondary school O/E programmes. Quite frequently all Form IV classes of a school will attend a camp. Two or three classes attend at one time. A variety of outdoor-pursuits-type activities are offered. An over-night tramp (participants hike to a spot and spend the night there) is introduced by the majority of schools. A few controlled 'risk' experiences may be initiated by the camp leaders.

Form V and VI classes (age 15-16) may be taken out for specific academic purposes. Biology and geography are the most common themes of these camps. The emphasis is on practical learning in a remote wilderness environment.
4.1.1 Summary of Survey Results

Local teachers' rating of expected outcomes of resident O/E experiences was very consistent. Primary, intermediate and secondary teachers appeared to share the same ideas about what O/E is capable of achieving. Improved self concept, development of class friendships and enjoyment of the outdoors/wilderness were the three most highly rated specific objectives.

The remainder of this dissertation will be devoted to answering some of the following questions: what is the reality of teachers' judgements about anticipated outcomes?; do children change in their perceptions of themselves and others?; and do they value the O/E experiences enough to express an attitude change toward nature, outdoor-recreation, environmental problems etc.? This last question is of particular interest because it is an area which has not yet received any attention in previous New Zealand studies.

4.2 PROCEDURES USED

On the basis of the survey results, three main outcome areas - self concept, social skills and environmental attitudes were chosen for study. These primary outcomes represent two of the three major components of O/E as discussed in the literature review (i.e. (1) personal and social development and (2) environmental studies). Their measurement is also consistent with the broad nature of this research.

These three primary outcome areas are to be assessed using psychometric attitude measurement techniques. Teachers' and students' comments, questionnaires and my own observations of the camp experiences will be used to verify the test results. Hopefully, this approach combines the strengths of both objective and subjective evaluation. Where appropriate, comments concerning other possible outcomes will be made.

Choice of Appraisal Instruments

Kerr (1968, p. 25) makes a statement pertinent to the use of psychometric tests. He says that "... we are not concerned in curriculum evaluation with selecting or ranking individuals but with overall changes in group performance. For this reason, the evaluation instruments do not need to be as refined as tests for discriminating between individuals, although account still needs to be taken of principles of test construction such as the validity of the instrument, its reliability and sensitivity".
Keeping this statement in mind, the choice of specific instruments for this study was based on the following criteria:

1. A complete instrument and instructions on its use were readily available.
2. The scale appeared to measure what it was supposed to measure (it had face validity).
3. The test had known or proven reliability.
4. The administration and scoring was relatively quick and easy.
5. The length and level of difficulty of the test was appropriate to the students' age and ability.
6. The tests were reasonably appropriate to the New Zealand situation and did not require extensive modifications.
7. The range of areas covered by one or more tests related to the objectives of the camp under study (content and construct validity was evident).
8. The tests elicited co-operation from the teachers and pupils.
9. The tests had been used and approved by qualified researchers.

Methods Trial

Before the instrument choice was finalized, a scale was developed for use with a Form IV boys' camp. The purpose of this exercise was to become familiar with the mechanics of this type of testing programme; for example problems involved with:

- scale development;
- administration, scoring and analysis;
- teacher and student co-operation;
- pre and posttesting reactions of students; and
- vocabulary and reading difficulties of students.

For this methods trial, I used a semantic differential scale based on Van Meter's scale (1972). He had developed a scale to measure students' (11 to 12 years of age) perceptions of the likely outcomes of O/E camps. Although this research scale was not used in the final study, (the semantic differential technique proved to be too time consuming to be hand scored) much useful experience was gained. The results and scale used for this pilot experiment are given in Appendix B.
Description of Instruments Used

A different battery of tests was used at each of the Standard IV, Form IV and Form VI levels, with some overlap between the two younger levels and the two older levels.

Table 4.3 summarizes the psychometric appraisal techniques used in this study.

**TABLE 4.3** Names and formats of tests used in this study at each of the three educational levels (numbers include both experimental and control groups).

<table>
<thead>
<tr>
<th></th>
<th>STANDARD IV (n = 73)</th>
<th>FORM IV (n = 117)</th>
<th>FORM VI (n = 148)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SELF CONCEPT</strong></td>
<td>Piers-Harris/Soares &amp; Soares Self Concept</td>
<td>Piers-Harris Self Concept</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(55 yes/no items)</td>
<td>(40 yes/no items)</td>
<td></td>
</tr>
<tr>
<td><strong>SOCIAL SKILLS</strong></td>
<td>MGOAI</td>
<td>MGOAI</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Millward-Ginter Outdoor Attitude Inventory)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>42 3pt. Likert items</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>ENVIRONMENTAL ATTITUDES</strong></td>
<td>PWAS (Passineau Wilderness Attitude Scale)</td>
<td></td>
<td>PWAS</td>
</tr>
<tr>
<td></td>
<td>20 Likert/forced-choice items</td>
<td></td>
<td>37 Likert/forced-choice items</td>
</tr>
</tbody>
</table>

At Standard IV, the measurement techniques emphasized self concept, social skills and attitudes toward O/E; at Form IV, attitudes toward the outdoors and wilderness were stressed; and at Form VI, attitudes toward the environment (in general) and wilderness were measured. This pattern was based on the objectives of the particular camp but was within the overall pattern of intentions represented by the combined judgement of survey respondents.
4.2.1 The Self Concept Scale

The self concept instrument used for Standard IV students, consisted of 40 randomly chosen items from an original 80 items of the Piers-Harris Children's Self Concept Scale (Piers and Harris, 1969), and 15 of the 20 items on the Soares and Soares Student Form of the Self Perception Inventory (SPI) (Soares and Soares, 1975). The original 80-item Piers-Harris scale was considered to be too long for most Standard IV students to complete in one sitting. However, the additional 15 items of Soares and Soares SPI seemed to cover areas with which primary teachers were concerned but were not included in the 40 Piers-Harris items. The 55 item scale is given in Appendix C.

At the Form IV level, only the 40 items were given to the students. This allowed more time for the administration of two other scales at this level.

The Piers-Harris scale was designed primarily for research on the development of children's attitude to self and correlates of this attitude. The scale has been fairly widely used in educational research. The test is recommended for studies of change in self concept, but requires the use of a control group. This instrument has been standardized for ages 8 through 15 years. The answer format is forced-choice (i.e. only two possible answers). A single total score is obtained, although the authors suggest that the items of their original scale may be grouped into six subscales. They are:

(1) behaviour;
(2) intellectual and school status;
(3) physical appearance and attributes;
(4) anxiety;
(5) popularity; and,
(6) happiness and satisfaction.

Two other known studies have used one or the other of these scales for evaluating school camp experiences (Duke, 1968; and Hill, 1978).

Reliability

A reliability index can indicate either the homogeneity of items in a scale (internal consistency or \( r_{xx} \)) or the stability of rank orders of individuals over a period of time (test-retest or \( r_{tt} \)). It is important that the test-retest reliability of the measurements be computed in every situation.
where the test is applied (Guilford, 1965, p.439). This is particularly true of heterogeneous scales such as the Self Concept Scale.

The reported reliabilities of the two scales (Piers-Harris and SPI) are given below in Table 4.3. The test-retest reliabilities for this investigation were found by correlating the pretest scores with the posttest scores of the control groups. At Standard IV, $r_{tt}$ was found to be 0.77 ($n = 25$) and at Form IV, $r_{tt}$ was 0.80 ($n = 45$). These values are considerably higher than the minimum acceptable level for research, which is 0.50. They also correspond almost exactly to what has been found in other studies (refer below).

TABLE 4.4 Reported reliability for self concept instruments used in this study.

<table>
<thead>
<tr>
<th></th>
<th>Internal Consistency ($r_{xx}$)</th>
<th>Test/Retest ($r_{tt}$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Piers-Harris</td>
<td>0.78 - 0.93</td>
<td>0.77</td>
</tr>
<tr>
<td>80 Items</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soares &amp; Soares</td>
<td>0.64 - 0.85</td>
<td>0.79 - 0.89</td>
</tr>
<tr>
<td>(SPI) 20 Items</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Concurrent Validity

The authors correlated the scores obtained on the Piers-Harris scale with another self concept scale (Lipsitt Children's Self Concept Scale) and found a correlation of 0.68 (i.e., one type of concurrent validity). Good validation scores are difficult to obtain in psychometric studies. A correlation of 0.68 therefore is a good result. Piers and Harris correlated their scale with teachers' and peers' ratings and found a figure of the order of 0.40. Teacher and peer ratings are known to be less reliable than objective measures therefore a correlation of 0.40 is about what can be expected on average (Popham, 1975, p.185).

The teachers involved in the experiments of this study were asked to nominate those students whom they considered to have low self concepts and those having high self concepts. In Standard IV and Form IV, the level of agreement between teacher's ratings and the self concept scale was about 0.50 -
0.60. This indicates a reasonable level of concurrent validity for this scale.

4.2.2 The Millward-Ginter Outdoor Attitude Inventory

The Millward-Ginter Outdoor Attitude Inventory (MGOAI) was designed by Millward as part of his doctoral study (1973), and is described in section 3.2 of this document. In this text it will also be referred to simply as the Outdoor Attitude Inventory. The test was developed to measure changes in the outdoor attitude concepts of 11 to 12 year old children attending a five-day camp experience.

For the purposes of this research, one of the original 43 items was discarded, and the wording of several other items was modified. This was done to attain more relevance to the New Zealand environment (e.g. "forest" changed to "bush", "snake" changed to "spider" etc.). The original five-point Likert scale was converted to a three point scale to make the task easier for Standard IV pupils but was left as a five point scale for Form IV respondents. The modified scale can be found in Appendix C. The original inventory can be found in Millward's study (ibid, p.202).

Reliability

Millward reports an internal consistency measure of greater than 0.80, but gave no indication of the test-retest reliability. However, the test-retest reliabilities for this investigation were found to be 0.65 for Standard IV and 0.74 for Form IV. Those levels are more than adequate for this research.

Item discrimination is another way of determining a test's reliability. I felt some doubts about the ability of the MGOAI items to discriminate at the Standard IV level because the students were one year younger than Millward's group. For this reason, a comparison of scores of extreme groups (upper and lower 27%) was performed to determine if any items were not sufficiently discriminating. The reader is referred to Anastasi, (1976, p.612-613) for details. All Standard IV pretest scores were used (n = 90). A discrimination index of greater than 0.30 is generally considered to be adequate. All but six items achieved this level of discrimination between extreme groups on the pretest scores. Since these six items were in the 0.25 - 0.30 range, it was decided to retain all items, since some of the poorer discriminators might receive a greater range of responses on the posttest.
Validity

In terms of face and content validity, I considered the MGOAI to measure many of the outcomes that had been given a high ranking by the survey respondents. The "socialization" subscale of this inventory contains two statements with regard to teacher/pupil relationships, three statements on student relationships, and three statements referring to group cohesiveness; the "education" subscale consists of nine statements regarding the learning of studies and leisure activities in the outdoors, and the "environment" and "pollution" subscales contain many items related to conservation attitude and outdoor appreciation. Through these subscales, the Outdoor Attitude Inventory appears to include the broader aspect of conservation behaviour. Although survey respondents did not consider conservation behaviour to be an important objective of O/E, unexpected attitudes may develop as a result of O/E experiences. If this is the case, it is worth investigating whether or not students do reflect a change in their attitudes toward conservation. For this study then, conservation behaviour is considered to be one of the components of the broader category referred to as environmental attitudes.

The Outdoor Attitude Inventory is dealing with a variable that is somewhat abstract and not directly measurable, (viz, the outdoor attitude). The outdoor attitude therefore is considered to be a construct or, "... a theoretical idea developed to explain and to organize some aspect of existing knowledge" (Yeates, 1977, p.64). It is of some interest to how well the MGOAI is developed in terms of construct validity. (Millward suggests that there are four components to the outdoor attitude construct).

One way to test the construct validity of a scale is to see how much the subscales overlap (i.e., the common variance between them). The common variance is determined by squaring the correlation coefficients of the subscales. Since Millward's subscales are part of the same construct, we should expect some overlapping (e.g. up to about 20% common variance). Another way of testing construct validity of a scale is to compare it with other scales. We should also expect a rather low correlation coefficient between any two different subscales. Tables 4.5 and 4.6 show this to be the case both between subscales and different scales.
### TABLE 4.5 Correlations Between Outdoor Attitude Subscales

<table>
<thead>
<tr>
<th>SUBSCALES (MGOAI)</th>
<th>CORRELATION</th>
<th>COMMON VARIANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environment/Pollution</td>
<td>0.23</td>
<td>5%</td>
</tr>
<tr>
<td>Environment/Education</td>
<td>0.38</td>
<td>14</td>
</tr>
<tr>
<td>Environment/Socialization</td>
<td>0.47</td>
<td>22</td>
</tr>
<tr>
<td>Pollution/Education</td>
<td>0.31</td>
<td>10</td>
</tr>
<tr>
<td>Pollution/Socialization</td>
<td>-0.01</td>
<td>0</td>
</tr>
<tr>
<td>Education/Socialization</td>
<td>0.21</td>
<td>4</td>
</tr>
</tbody>
</table>

1 Correlations are based on posttest scores of Form IV students (n = 90)

### TABLE 4.6 Correlations Between Outdoor Attitude Inventory and Other Scales

<table>
<thead>
<tr>
<th>SCALES</th>
<th>CORRELATION</th>
<th>COMMON VARIANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self Concept/Outdoor Attitude</td>
<td>0.21&lt;sup&gt;1&lt;/sup&gt;</td>
<td>4%</td>
</tr>
<tr>
<td></td>
<td>0.45&lt;sup&gt;2&lt;/sup&gt;</td>
<td>20</td>
</tr>
<tr>
<td>Wilderness/Outdoor Attitude</td>
<td>0.43</td>
<td>19</td>
</tr>
</tbody>
</table>

1 Correlations are based on posttest scores of Form IV students (n = 75)  
2 Correlation is based on posttest scores of Standard IV students (n = 77)
4.2.3 The Wilderness Attitude Scale and the Environmental Concern Scale.

Two other scales, designed by Passineau (1975) and aimed at measuring components of environmental attitudes, were used in this study. These two instruments were part of a series of 18 scales to be used by teachers in assessing major components of "environmental awareness" of 10 to 14 year old pupils. As far as can be determined, the two scales used in this study have not previously been used for school camp evaluations, although Passineau suggests that they may be used on a pre-post basis for evaluation purposes.

The wording of both scales was modified slightly to be more relevant to the New Zealand situation. The Environmental Concern Scale has 35 items of forced-choice answer format and was used only with the Form VI students. It is designed to be administered prior to the Wilderness Attitude Scale so that the respondents are not aware of the true purpose of the scale. The true purpose of the scale is to "assess attitudes in, preferences for and motivation toward a variety of environmental topics, problems and solutions" (ibid, p.67). However, it forces the students to make a choice between environmental issues and other issues of societal importance such as war, drugs, crime and poverty. Because the Environmental Concern Scale is dealing with two areas of importance which are not mutually exclusive, a low score on this scale is not necessarily bad. It simply indicates where the students' interests lie. Passineau suggests that the score on this scale may be of help in interpreting scores obtained on other scales.

The Wilderness Attitude Scale was administered to both Form IV and Form VI students. It is composed of 37 items; partly Likert scale and partly forced-choice. A shortened version of this scale (only 20 items) was used for the Form IV respondents, (items were chosen at random from the original 37).

The author states that this scale "measures the degree to which an individual (1) advocates the utilization of natural areas for wilderness purposes versus non-wilderness purposes (use in existing natural state) and (2) prefers activities which indicate pro wilderness versus non-wilderness sentiment (e.g. preference for natural areas and associated objects rather than for areas of significant human development)" (ibid, p.80).

The two scales can be found in Appendix C.
Reliability

The reliability indices, (internal consistency reliability only, was given), as reported by Passineau (ibid, p.109), were 0.82 for the Environmental Concern Scale and 0.88 for the Wilderness Attitude Scale. Test-retest reliabilities were calculated for this study and are given in Table 4.5.

TABLE 4.7. Calculated test-retest reliability indices for the Passineau scales used in this study.

<table>
<thead>
<tr>
<th>Scale</th>
<th>Educational Level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Form IV</td>
</tr>
<tr>
<td>Environmental Concern Scale</td>
<td>-</td>
</tr>
<tr>
<td>Wilderness Attitude Scale</td>
<td>0.62</td>
</tr>
</tbody>
</table>

\[1\] Reliability index of the shortened version of the Wilderness Attitude Scale can be expected to be less.

Passineau tested all items for their ability to discriminate between upper and lower scoring students and retained only those items which were adequate.

Validity

According to Passineau, items of both scales were judged by environmental "experts" on content validity and all items were found to be adequate. The teachers and administrators of my study were very interested in the Wilderness Attitude Scale in particular. This would seem to indicate a high level of face validity for this scale at least.

In addition, to assess the concurrent validity of these scales, interviews were conducted with 20 students (about 25% of the study population). The students chosen for the interviews had obtained a range of low to high scores on the Environmental Concern Scale. They were asked what sorts of activities they liked, what clubs they belonged to, their reasons for particular responses to items on the scale, etc. A copy of the questions asked at
these interviews is contained in Appendix D.3. The interview questions were based on a questionnaire used by Dyar (1975, p.149).

A 60-70% agreement was attained between the students scores on both scales and his/her responses to the interview questions. This represents a high degree of concurrent validity.

4.3 EXPERIMENTAL DESIGN

In all cases except one, a pre-post non-equivalent control group design was used. This means that the experimental group students were not individually matched with the control group students. However, wherever possible, a comparable group (e.g. the same academic ability and the same or a comparable school) was used.

The pretests were usually administered five to seven days before the camp experience and again five to seven days after the camp. This short interval was used because of the probability of external factors causing changes in the areas being measured.

The one exception to these generalizations is the design used with one of the Standard IV groups. This design will be described in further detail in the section referring to that part of the study (section 5.2).

4.4 ADMINISTRATION FOR STANDARD IV and FORM IV STUDENTS

The students were introduced to me a few days prior to the administration of the tests. They were told that I was interested in how students feel about some things, particularly with regard to O/E experiences. They did not realize that written work was involved until the actual testing time (the word "tests" was never used). Students were made aware that their answers would help teachers to provide better camping programmes in the future. The importance of an honest answer (there were no right or wrong answers) was emphasized. Students were asked to put their name or a code name on the forms and were told that no-one except the researcher would see the individual student's results. Instructions for the test and examples were then given.
No mention of the second testing session was made at the pretest session. The posttest was identical to the pretest and administered a few days after the camp. The researcher stressed the importance of this part of the research in improving future camp programmes. The students were asked to respond as if they had never seen the questions before, and to answer as they honestly felt at present. Instructions were then given again.

Administration for Form VI Students

The administration of the scales used at the Form VI level was different from that given at the two younger levels. This was primarily because the researcher wished to conceal the environmental nature of this part of the study from the students involved. Further detail on the methods employed will be given in section 5.5.

4.5 SCORING AND ANALYSIS

All tests were hand scored with a stencil cut-out. A high number was allotted to the most positive response and a low number to the most negative response. In forced-choice items, a one is given to the positive answer and a zero is given to a negative response.

Total scores were recorded on computer data sheets. Individual item responses for the Self Concept and Outdoor Attitude Scales were also recorded for computer analysis.

Significant differences between pre and posttest total scores at the group level for all scales was determined using multiple analysis of covariance. A package from the University of Carolina known as MANOVA was used for this purpose. This package allowed the investigator to check for significant differences between the experimental groups and the control groups. The pretest scores are used as covariates. This statistically equates non-equivalent groups on relevant variables. According to Campbell and Stanley (1963, p.23), this technique is usually preferable to simple gain score comparisons.
Other desirable elements of MANOVA are that it tests for regression effects on each of the scales (i.e., homogeneity of variances between groups); it gives the estimates of the correlation between scales when adjusted for covariates, and it performs multivariate and univariate tests for each effect tested.

MANOVA revealed that regression effects were statistically significant in all the experiments of this study. There was therefore, initially some doubt about the credibility of the MANOVA results. For this reason, a simple analysis of residuals was performed on each scale, at each age level, to take these regression effects into account. The procedure for the residuals analysis can be found in Cronbach and Furby (1970).

No differences were found between the results of the residuals analyses and MANOVA. Therefore only MANOVA outcomes are reported. Hays (1973, p.611) suggests that as the number of different tests increases, spuriously significant results are more likely to occur. To accommodate this problem, the probability level which is normally considered significant (e.g., $p = 0.05$) for the experiment, is divided by the number of scales used in the analysis. For example, in the analysis of Millward's subscales, only a probability level of 0.012 (viz. $0.05/4$) should be considered statistically significant because four tests are involved in the analysis. The results of all the experiments in this study have been treated in this way.

A Statistical Package for Social Sciences (SPSS) T-test programme was used to determine statistical differences on the pre and post scores of each item of the Self Concept and Outdoor Attitude Inventory. This analysis was performed to determine whether responses that did change significantly could be grouped into like-clusters (e.g., on the self concept scale - did the "anxiety" element, as suggested by Piers and Harris, change from the pre to posttest?). It was recognized that significant differences in items may be found by random error because of the sheer number of items involved in the analysis. However, if changes in individual items were occurring, it was of interest to know if these items were related in content.
Measurement of Individual Changes of Score

The scales used in this study were not designed to examine changes in the attitude structure of individual students; the unit of study was the class. Nevertheless, the teachers involved in the study were interested to know whether some individual children respond more than others to a camp experience. The use of the standard error of measurement (SEM) can give some idea of what is more than just a random change on an individual's score. Anastasi (1976, p.127-129) gives a good description of the purpose of the SEM and how it is calculated. An individual's score change is deemed significant at the 0.05 probability level if it is more than twice the SEM. Reported changes in individuals in this study are determined in this way.
CHAPTER 5

EXPERIMENTAL RESULTS

ORGANIZATION OF THIS CHAPTER

Five experiments were carried out in this study to measure the outcomes of resident O/E. Two experiments were performed at each of the Standard IV and Form IV levels and one experiment was conducted at the sixth form level. These three levels effectively include the age range in which resident O/E activities are undertaken in New Zealand.

Each of the five separate studies deals with the characteristics, the intentions and the outcomes of one school camp. Each, therefore is presented in this chapter as a report of an individual psychometric experiment. Chapter 6 collectively considers the results of all five investigations.

Unless stated otherwise, in this chapter the term "significant" means "statistically significant at 0.05 probability level".

5.1 EXPERIMENT 1 - STANDARD IV CAMP ONE

5.1.1 Background

Description of the Study Group

The experimental (n=24) and control n=25) classes used in this experiment were from the same school - an open-planned school. The average age of the children was 10 years. The children of both classes were generally from a lower socio-economic background. Many of them exhibited quite demonstrative behaviour in and out of the classroom. Eighty percent of the experimental group had been exposed to camping or a similar type of experience (e.g., caravanning with the family), whereas this was true of only 55% of the other class. Only the former group would attend a camp. The control group would continue their normal lessons in the classroom.
Statement of School Camp Objectives

The teacher of this class listed his expectations of the camp programme. They were ranked as follows:

1. improved self concept and independence;
2. increased confidence and maturity;
3. improved relationships among class members;
4. improved ability of students to work as team members;
5. exposure to a wider range of experiences; and,
6. greater knowledge of natural history, etc.

The teacher mentioned that he expected behaviour of badly-behaved students to improve as a result of the first four stated objectives.

Description of the O/E Experience

The main theme of the camp was agriculture. Related topics were introduced by the teacher of the experimental class in advance of the trip. The children stayed for four days at a rural-based camp, complete with dormitories and dining hall. Most of the time was spent in the outdoors; walking to near-by farms to learn about different farming methods; playing in the adventure playground during freetime; running a racecourse track to improve their fitness; and watching the racehorses to learn about horse-racing as an occupation. One morning was spent at a native tree nursery.

Methods

The modified Piers-Harris Children's Self Concept Scale and the Millward-Ginter Outdoor Attitude Inventory (MGOAI) were selected to evaluate the outcomes of the camp. The second instrument (the MGOAI) would among other things, give an indication of a change in the children's perceptions of their peers and also their attitude toward learning in the outdoors. An oral questionnaire based on a method employed by Kopp and Barnes (1971, p.39-42) was also used to assess the children's attitudes toward their O/E experience.

Experimental Design

A pre-post non-equivalent control design was used in this experiment. A two-week interval occurred between the pre and posttests for both the experimental and control group. The tests and questionnaire were orally administered to the experimental group five days prior to, and again, one week after the camp. Approximately one and a half hours were taken to complete all the items. A rest was given half way through the testing session.
I attended the camp as a participant-observer and administered all the tests and questionnaires. Three months after the posttest session I again visited the class to ask the teacher which children he thought had changed the most as a result of the camp, and to ask the children which camp event they best remembered.

The test results were analyzed with MANOVA and T-test programmes as described in Chapter 4.

5.1.2 Results

Self Concept

A statistically significant difference was found between the experimental and control groups on the total self concept score. This significant difference is attributed to an increase of five percent by the experimental group and a decrease of four percent by the control group. Table 5.1 gives these results and Figure 5.1 illustrates the mean and range of scores for both groups. It was not clear which components of the self concept scale changed the most. A within-test analysis of individual item scores did not reveal any pattern of change in the self concept of either group. Those items which did show significant changes are given in Appendix E, Table E.1.1.

<table>
<thead>
<tr>
<th>TABLE 5.1 Mean Self Concept Scores for the Standard IV Experimental and Control Groups - Camp One.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SELF CONCEPT SCALE</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>PRETEST</strong></td>
</tr>
<tr>
<td>37</td>
</tr>
<tr>
<td><strong>POSTTEST</strong></td>
</tr>
<tr>
<td>39*</td>
</tr>
</tbody>
</table>

1. n = number of students used in the final analysis
2. σ = standard deviation.
   * significant at the 0.05 probability level.
FIGURE 5.1 Mean and Range of Scores on the Self Concept Scale for the Standard IV Experimental Control Groups - Camp One.

The standard error of measurement (SEM) (refer to Chapter 4 for details), was calculated to determine how many camp participants made significant shifts in their self concept scores. The SEM data was then compared with the teacher's judgement about which pupils had changed. Four students (16% of class) had gained significantly according to the SEM data (8% decreased significantly). The teacher had nominated only two of these students as having become more confident in their behaviour. Other students which he thought had changed did not show significant score gains.

MGOAI

On this scale no significant differences were found between the experimental and control groups. This applied to the total score, the subscale scores and the individual items of the Outdoor Attitude Inventory. Table 5.2 gives the results of this part of the experiment. Figure 5.2 compares the two groups on their mean and range of scores.
TABLE 5.2  Mean Outdoor Attitude Scores for the Standard IV Experimental and Control Groups - Camp One

<table>
<thead>
<tr>
<th>(SUB)-SCALE</th>
<th>Experimental (n=24)</th>
<th>Control (n=25)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\bar{x}$</td>
<td>$\theta$</td>
</tr>
<tr>
<td>TOTAL</td>
<td>Pre</td>
<td>98</td>
</tr>
<tr>
<td></td>
<td>Post</td>
<td>101</td>
</tr>
<tr>
<td>ENVIRONMENT</td>
<td>Pre</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>Post</td>
<td>37</td>
</tr>
<tr>
<td>POLLUTION</td>
<td>Pre</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>Post</td>
<td>22</td>
</tr>
<tr>
<td>EDUCATION</td>
<td>Pre</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>Post</td>
<td>21</td>
</tr>
<tr>
<td>SOCIALIZATION</td>
<td>Pre</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>Post</td>
<td>21</td>
</tr>
</tbody>
</table>

FIGURE 5.2  Mean and Range of Scores on the Outdoor Attitude Inventory for Standard IV Experimental and Control Groups - Camp One.
The SEM data suggests that 20% of the students made positive significant shifts on the total score of the MGOAI. Only four percent showed a significant decline. This may indicate that some students at least benefitted from the outdoor-learning aspect of the camp.

**Questionnaire**

The responses to the questionnaire (Appendix D.1) suggest also that some of the students did not enjoy the camp experience as much as they had expected. This may explain why some individual students showed a significant increase in their outdoor attitude scores but no general increase at the class level. Although I was unable to determine the exact source of disappointment for these children, the educational aspect of the camp at least appeared to be satisfactory to all.

In response to the question, "what was the most memorable event on camp?", more than one third elected the "prowler incident" (A prankster had been successful at frightening many of the children during the evenings at camp). The second most frequently cited event was observation of the horses. Playing, exploring and fitness work were other activities which some of the pupils most remembered. These events may have had some influence on their self concept change.

5.1.3 **Summary of Test Results of the Standard IV Camp One Experiment**

(1) A mean gain of 5% (significant at the 0.05 probability level) was found for the experimental class on the modified Piers-Harris Children's Self Concept Scale; however, only 16% of the students made significant gains in their self concept scores; and,

(2) No significant differences between the experimental and control groups were found on the Millward-Ginter Outdoor Attitude Inventory.
5.2 EXPERIMENT 2 - STANDARD IV CAMP TWO

5.2.1 Background

Description of the Study Group

The experimental class (n=24) used in this experiment was from a traditional school, (i.e., closed classrooms). The children (average age was 10 years) were of a mixed socio-economic background and had a wide range of academic abilities. Generally these students seemed calmer and less demonstrative in the classroom than the previous group. A control group was not available for this experiment. However, where appropriate, comparisons with the control group from the previous experiment were made.

Statement of School Camp Objectives

On the survey, the teacher of this class ranked his anticipated outcomes of the camp as follows:

(1) improved relationships among class members;
(2) improved self concept;
(3) exposure to a wider range of experiences;
(4) improved relationships with teachers ("teacher gets to know the children better");
(5) improved ability to work as a team member;
(6) learning to enjoy wilderness experiences; and,
(7) demonstrating conservation behaviour.

Description of the O/E Experience

Prior to the camp, activities relating to the theme of the O/E programme (i.e., conservation and plant ecology) were undertaken in the classroom and on the school grounds. The camp was held over four days at a State Forest camp located in a thermal mountain-resort town. Accommodation was in two-person cabins.

The children were in the outdoors for most of their stay; they were taken on a number of nature trail walks by the Forest Park ranger and their teacher and they visited the Visitor's Centre there, the meteorology station and the hot-pools. In the evenings, the children had sing-song sessions and played softball or other games with each other and the teachers.
Methods

The Piers-Harris Children's Self Concept Scale and the Millward-Ginter Outdoor Attitude Inventory (MGOAI) were used to assess the outcomes of this camp. The MGOAI would not only give an indication of changes in the social skills of the children, but it would indicate attitude changes toward such concepts as pollution, conservation, plants and animals and outdoor-learning. A post-camp questionnaire was also used to determine the children's feelings toward the O/E experience in general.

Experimental Design

In contrast to the first Standard IV experiment, a type of Time-Series design was used in this case. Since no control group was available, it was preferable to use this approach rather than the one-group (i.e. also no control group) pretest-posttest design (Campbell and Stanley, 1966, p.37-43). The essence of the Time-Series design is that it provides an experimental change, in this case the camp, into a time series of measurements. Therefore it has been used to take into account the effect of events leading up to the camp on the children's perceptions and attitudes.

Figure 5.3 illustrates the type of Time-Series design used here.

![Time-Series Design Diagram]

FIGURE 5.3 The Time-Series Experimental Design Used With Standard IV Students - Camp Two.

Key

01 = pretest 1 (prior to any camp lead-up programme)
02 = pretest 2 (one day after discussion on camp themes begin)
03 = posttest (2 days after end of camp, prior to camp follow-up).

The same tests were used at all three sittings.
I attended the camp as a participant-observer and administered all the tests and questionnaire. Three months after the camp, I interviewed the teacher about which children he thought had gained most from the O/E trip. At this time the children who attended camp were asked to write down the one camp event that they best recalled.

A T-Test was performed to test for significant differences between the first two tests, between the last two tests and between the first and last tests. These analyses were performed with both the total scores and the individual item scores of each scale.

5.2.2 Results

Self Concept

A significant difference was noted only between the two pretests on the Self Concept Scale. This difference, although statistically significant at the 0.05 probability level, represents only a six percent increase in scores. A non-significant gain occurred from the second pretest to the posttest. Table 5.3 shows these score changes. Figure 5.4 gives the mean and range of scores for all three tests.

The first significant gain may have been due to the fact that the children had been exposed to the test once before (i.e., pretesting influence). However, the results of the control group from the first experiment suggest that the pretesting influence did not exist. It is more likely that the gain in this second experimental group's self concept score was caused by "enjoyment in anticipation" of the camp.

TABLE 5.3 Self Concept Scores for Standard IV Students - Camp Two Over a Four-Week Period.
(The camp was held between the second pretest and the posttest).

<table>
<thead>
<tr>
<th>Self Concept Scale (n=24)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest 1</td>
</tr>
<tr>
<td>( \bar{x} )</td>
</tr>
<tr>
<td>36</td>
</tr>
<tr>
<td>( \sigma^2 )</td>
</tr>
<tr>
<td>9.98</td>
</tr>
</tbody>
</table>

1. \( n \) = number of students in the final analysis.
2. \( \sigma \) = standard deviation.
* Significant at the 0.05 probability level.
A number of individual statements from the Self Concept Scale were identified as the cause of the changes in total scores. (These items are contained in Appendix E, Table E.2.1). However, only one of these items demonstrated a significant gain (22%) from the second pretest to the posttest. The item was "I am a happy person". The remainder of the significant gains and losses occurred before the camp, (i.e., from the first pretest to the second pretest).

The standard error of measurement (SEM) for this group showed that about 20% of the class (n=5) had significant gains on their individual self concept scores, (8% had significant losses). The teachers judgement coincided quite well with the SEM data, as three of the five pupils showing a significant change (by SEM data) had been named by the teacher as having improved in their self concept since camp.
Again, a significant difference (at the 0.01 probability level) was found between the two pretest scores (a three percent gain) but not between the second and last test scores. These results are given in Table 5.4. The mean and range of scores are illustrated in Figure 5.5. It seems likely that the significant increase in precamp scores was not caused by a pretesting influence. Rather it may be attributed to the classroom preparation work on conservation, etc. This assumption is based on the fact that the control group from Experiment 1 showed no significant change on the Outdoor Attitude Inventory.

An analysis of individual items of the camp group's MGOAI scores showed only two significant changes; one was that the pupils anticipated a better relationship with the teachers (i.e., they gained 20% on two items before camp) and the other was that the children appeared to be more interested in books about nature after the camp (22% gain). Many other items showed positive significant changes over the entire testing period (i.e., from the first pretest to the posttest). They were not statistically significant however, from one consecutive test to another. Items that showed a unidirectional change (either increasingly positive or increasingly negative) over the four-week interval are given in Appendix E, Table E.2.2.

An analysis of individual students' MGOAI scores, based on SEM data, was also performed. Only 12% of the students made significant gains whereas 20% made significant losses from the second pretest to the posttest. This suggests that a number of children were disappointed by some aspects of outdoor-learning.

Questionnaire

The camp participants were asked to state their preference for activities they had experienced at camp. This question was the first part of a postcamp questionnaire which can be found in Appendix D.2. The walk in the "bush" was the activity they liked best. (A day was spent walking a nature trail identifying and collecting plants, picnicing adjacent to a waterfall, etc.). The walks in the exotic plantations were given second place and "being on their own"/dining with the group were equally ranked as the third best experiences.
TABLE 5.4 Mean Scores on the Outdoor Attitude Inventory for Standard IV Students - Camp Two.

<table>
<thead>
<tr>
<th>OUTDOOR ATTITUDE INVENTORY (n=24)</th>
<th>Pretest 1</th>
<th>Pretest 2</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\bar{x}$</td>
<td>$\theta$</td>
<td>$\bar{x}$</td>
<td>$\theta$</td>
</tr>
<tr>
<td>103</td>
<td>8.57</td>
<td>106**</td>
<td>8.59</td>
</tr>
</tbody>
</table>

** significant at the 0.01 probability level (T-test analysis)

FIGURE 5.5 Mean and Range of Scores on the Outdoor Attitude Inventory for Standard IV Students - Camp Two.
In response to other questions, the majority felt that they had learned a lot on the camp. All said that they would enjoy another camp of a longer duration.

5.2.3 Summary of Test Results of the Standard IV Camp Two Experiment

(1) A statistically significant gain of six percent was found in the mean scores of the modified Piers-Harris Children's Self Concept Scale, prior to the camp; however, no significant gain in the average self concept score resulted from the camp experience;

(2) A significant gain of three percent occurred in the interval before camp in the mean scores of the MGOAI. No further gain resulted from the camp experience, and,

(3) both changes appear to have been associated with preparation for the camp.

5.3 EXPERIMENT 3 - FORM IV LOWER ABILITY CAMP ONE

5.3.1 Background

Description of Study Group

This experiment involved two lower ability classes (n=30) from a large urban co-educational high school. The average age of these students was 14 years, and the average deviation - I.Q. was 70. This gives them an approximate mental age of 12 years. (refer to Anastasi, 1976, p.86-87). A similar sized equivalent-ability control group was not available. However, two classes (n=45) from a comparable high school were available to contrast with this experimental group. One of the classes (n=18) was a lower ability class. The other class (n=24) was average to above average in academic ability. While the control group was not an ideal match, it provided an opportunity to make two preliminary comparisons. The most interesting aspects of this experiment were first, to compare two low-ability groups and thus determine the effects of school camps on low I.Q. students; and second, to compare responses of low and better-ability students.

The experimental students in this part of the study demonstrated somewhat agitated behaviour in the classroom. One teacher commented that it was difficult to find staff to go on camp with them because of the classroom-behaviour problems.
Stated Objectives of the School Camp

One of the teachers attending the camp listed the following as intended outcomes:

1. increased confidence and maturity;
2. improved self concept;
3. improved relationships with other class members;
4. exposure to a wider range of experiences;
5. improvement in badly-behaved students;
6. learning to enjoy wilderness experiences; and,
7. greater knowledge of natural history, etc.

Description of the O/E Experience

Precamp classroom preparation was minimal. The students were given forms outlining basic camp information and a list of things to bring. Each class (n=15) spent four days, (near the end of the school year), in a rural environment. On the first day, the students "tramped" with packs up a river-bed to a camping area. Prior to the excursion, the students were instructed in bushcraft skills and were expected to be able to set up their tents, build one fire per team of four and plan and cook all their own meals (rations were given at the beginning of camp). No other activities were formally planned during this time. "Freetime" was spent walking up the river and into some nearby hills, raft-building, swimming, tending fires and talking with other students of the team.

The final night was spent in dormitories. An improvised concert was held after the evening meal which was prepared by the staff. On the last morning, the students visited a local historical attraction and amused themselves on "confidence-building" equipment which was set up at the camp, (e.g., Flying-Fox, trampoline, go-karts).

On their return to school, one class tape-recorded their impressions of camp and the other group wrote camp diaries. These events occurred prior to the posttest.
Methods

Three instruments were used to evaluate the objectives of the camp. These were the shortened Piers-Harris Children's Self Concept Scale, the Millward-Ginter Outdoor Attitude Inventory (MGOAI) and the shortened Passineau Wilderness Attitude Scale. The MGOAI included a socialization subscale which could indicate whether or not changes in peer relationships were occurring. The combination of Millward's other subscales and Passineau's scale could be used to indicate possible shifts in the environmental attitudes of the students.

Following their return to school, the camp participants were asked to write down (or tell me) the best and the worst thing they remembered about their experience.

Experimental Design

A pre-post non-equivalent control group design was used in this experiment. A two-week interval lapsed between the pre and posttests for both the experimental and control groups. The experimental group was tested five days prior to and one week after their trip.

I attended one of these camps as a participant-observer and administered all the tests. Some of the students needed help reading the questions but generally all were willing, and able to complete the tests in one class period.

5.3.2 Results

Self Concept

No significant differences between the mean self concept scores of the lower ability experimental and control groups were found. Table 5.5 gives these results. A comparison of the lower ability control group with the upper ability control group showed that both of these classes reacted to the test in the same way (viz, they both did not change). For this reason, further analysis on this scale was performed with the combined control group (n=45). Figure 5.6 shows the mean and range of scores for the experimental class and the combined control class.
TABLE 5.5 Mean Self Concept Scores for the Form IV Experimental and Control Groups - Camp One.

<table>
<thead>
<tr>
<th>SELF CONCEPT SCALE</th>
<th>Experimental (n=30)</th>
<th>Lower Ability Control (n=18)</th>
<th>Upper Ability Control (n=27)</th>
</tr>
</thead>
<tbody>
<tr>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>PRETEST</td>
<td>24 5.85</td>
<td>28 6.28</td>
<td>28 5.96</td>
</tr>
<tr>
<td>POSTTEST</td>
<td>25 6.28</td>
<td>30 7.06</td>
<td>29 6.56</td>
</tr>
</tbody>
</table>

1. The Experimental group consists of 30 lower ability students as is directly comparable with the lower ability control group.
2. $\sigma$ = standard deviation.
FIGURE 5.6 Mean and Range of Self Concept Scores for Form IV Experimental and Control Groups - Camp One.
An analysis of changes on individual test items did not reveal any evidence contrary to the results given above. Although there were a small number of significant item changes within both groups, no definite pattern emerged from the analysis. A list of these significant score changes on items is given in Appendix E, Table E.3.1.

The standard error of measurement (SEM) data also supports the result that no change in the self concept of the camp students occurred. The experimental and control groups contained the same number of students showing significant movement (both positive and negative) on the self concept scale.

**MGOAI**

A significant change did appear, however, on the Outdoor Attitude Inventory. The difference between the control and experimental groups on this scale was four percent. However, this change was not due to a gain by the experimental camp group, but rather to an increase by the lower ability class in the control group. The upper ability control group also showed a gain but it was not statistically significant. This information is itemized in Table 5.6. Figure 5.7 compares the means and ranges of the total outdoor attitude scores of the experimental and control groups.

An analysis of the MGOAI's subscales shows that the lower ability control class made significant gains on two subscales; they increased on the "environment" and "pollution" subscales, but not on the "socialization" and "education" subscales. The more able control class did not show corresponding gains; they did not make significant shifts on the subscales, or on as many individual items as the less able group. (Refer to Appendix E, Table E.3.3). Therefore a pretesting influence is probably not responsible for the former group's gains. Rather, the low-ability control group may actually have experienced an unintentional classroom "treatment" which influenced their perceptions of the environment. These students were exposed to the teachings of a young, environmentally-conscious student-teacher in the interval between the pre and posttests. The upper ability group were not exposed to any new teachers or any environmental themes. This may explain the former group's gain.
TABLE 5.6 Mean Outdoor Attitude Scores for the Form IV Experimental and Control Groups - Camp One.

<table>
<thead>
<tr>
<th>(SUB) SCALE</th>
<th>MILLWARD-GINTER OUTDOOR ATTITUDE SCALE</th>
<th>Experimental (n=30)</th>
<th>Lower Ability Control (N=18)</th>
<th>Upper Ability Control (n=27)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>( \bar{x} )</td>
<td>( \theta )</td>
<td>( \bar{x} )</td>
</tr>
<tr>
<td>TOTAL</td>
<td>Pre</td>
<td>143</td>
<td>10.61</td>
<td>150</td>
</tr>
<tr>
<td></td>
<td>Post</td>
<td>143</td>
<td>12.51</td>
<td>156*</td>
</tr>
<tr>
<td>ENVIRONMENT</td>
<td>Pre</td>
<td>55</td>
<td>5.73</td>
<td>56</td>
</tr>
<tr>
<td></td>
<td>Post</td>
<td>54</td>
<td>5.13</td>
<td>59*</td>
</tr>
<tr>
<td>POLLUTION</td>
<td>Pre</td>
<td>31</td>
<td>3.34</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>Post</td>
<td>31</td>
<td>3.70</td>
<td>33*</td>
</tr>
<tr>
<td>EDUCATION</td>
<td>Pre</td>
<td>26</td>
<td>4.01</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>Post</td>
<td>27</td>
<td>3.70</td>
<td>31</td>
</tr>
<tr>
<td>SOCIALIZATION</td>
<td>Pre</td>
<td>31</td>
<td>3.40</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>Post</td>
<td>31</td>
<td>3.19</td>
<td>33</td>
</tr>
</tbody>
</table>

* significant at the 0.05 probability level.
FIGURE 5.7  Mean and Range of Scores on the Outdoor Attitude Inventory for the Form IV Experimental and Control Groups - Camp One.
The mean score of the experimental group did not change on the MGOAI. However, there was some movement of both students (within the class) and items (within the test) as a result of the camp experience. An analysis of the individual items of this scale suggests that camp participants may have changed their opinion toward certain outdoor activities. Four items decreased significantly and three showed significant gains. The students' mean scores for these items can be found in Appendix E, Table E.3.3. The SEM data suggests that while three percent of the students became significantly more positive on their total outdoor attitude score, about 25% decreased significantly.

Wilderness Attitude

The results of this scale showed a tendency for the camp students to have developed less favourable attitudes toward wilderness experiences. A significant loss of four percent occurred in the wilderness attitude post-scores of this group, whereas a gain of five percent was observed in the lower ability control group. The upper ability control group showed no change. Table 5.7 shows this data and Figure 5.8 shows the mean and range of scores. The SEM analysis also supports this result. Six percent of the experimental group increased significantly, whereas 17% decreased significantly.

TABLE 5.7 Mean Wilderness Attitude Scores for the Form IV Experimental and Control Groups in Camp One.

<table>
<thead>
<tr>
<th>WILDERNESS ATTITUDE SCALE</th>
<th>Experimental (n=30)</th>
<th>Lower Ability Control (n=18)</th>
<th>Upper Ability Control (n=27)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRETEST</td>
<td>$\bar{x}$ 7.85</td>
<td>$\bar{x}$ 4.53</td>
<td>$\bar{x}$ 7.41</td>
</tr>
<tr>
<td>POSTTEST</td>
<td>64* 8.50</td>
<td>72 7.14</td>
<td>69 7.67</td>
</tr>
</tbody>
</table>

* significant at the 0.05 probability level.
FIGURE 5.8 Mean and Range of Scores on the Wilderness Attitude Scale for the Form IV Experimental and Control Groups - Camp One.
Following the camp, the students were asked to name the best and worst thing they remembered about their experiences. In one group, most mentioned that the best things were the one "decent" meal they had on the last night (cooked by staff), sleeping in bunks as compared to tenting, having a swim after a long walk, "fooling around" and the busride. The worst thing they said were the meals they made for themselves or the walks ("tramp up the riverbed"). These comments seem also to suggest that some aspects of the camp experiences were not as enjoyable as they had anticipated.

5.3.3 Summary of Test Results of the Form IV Camp One Experiment

(1) No significant difference was found on the experimental group's mean self concept scores of the shortened Piers-Harris children's Self Concept Scale;
(2) the experimental group showed no significant change on the mean total or subscale scores of the Millward-Ginter Outdoor Attitude Inventory. Some students may have become negative toward certain outdoor activities;
(3) the experimental group became significantly more negative in their attitude toward wilderness as measured by Passineau's Wilderness Attitude Scale. This loss, however, was only of the order of four percent;
(4) the lower ability control group students made a significant gain in their mean total outdoor attitude score and on their environment and pollution subscale scores. These gains were of the order of five percent;
(5) the lower ability control group demonstrated a gain of five percent on their wilderness attitude score; and,
(6) both of these two latter gains appear to be a consequence of teachings by an environmentally-conscious student-teacher during the testing period. This "treatment" was unintentional.
5.4 EXPERIMENT 4 - FORM IV LOWER AND UPPER ABILITY CAMP TWO

5.4.1 Background

Description of Study Group

Four classes were selected from a large urban co-educational high school. A resident O/E programme had been developed over several years at this school for both Form III and IV classes. Under normal circumstances, all third and fourth form classes would participate in an annual school camp. The Form IV camp emphasized the learning of outdoor skills and "environmental concerns" (i.e., natural history, respect for nature, etc.).

Teachers undertaking O/E at this school were very well-prepared for the trips. They all had participated in an on-site, three-day inservice course prior to the camp. At this time, they became familiar with the activities they would be undertaking with the students, and the physical conditions of the area. All participating teachers appeared knowledgeable about the outdoors.

A lower ability experimental class (n=18) and an average to above-average ability class (n=27) were selected as experimental groups. They were matched with two similar control classes that would not attend a camp. The control group was the same one used for the previous Form IV study in experiment 3. In this case however, the experimental and control groups were well matched. A direct comparison of the effect of an O/E experience between less capable and better students would be possible.

Most of the students of both experimental and control groups had previously done some school camping.

Statement of School Objectives

The teachers involved with the camp experience generally hoped that the following objectives would be met:

1. personal(ity) development of the students (improved self concept and confidence;
2. appreciation and enjoyment of the outdoors;
3. improved relationships among classmates;
4. improved teacher/student relationships;
5. learning a new range of leisure activities; and,
6. learning through practical experience.
Description of Experience

Prior to the trip, (and to the pretest), the more able students were required to form teams and organize their food and equipment. These students held discussions on the reasons for going on camp, planning considerations, etc. The less able group had very little precamp discussion. Both these classes arrived at the site at the same time but activities were alternated so that the groups did not mix.

The O/E trip was held over three days at the end of the school year in a Forest Park mountain environment. One night was spent in tents and one night in a ski hut above the timberline. Activities included "bush-tramping", a night walk to the Forest Park Visitor Centre for a ranger talk, canoeing, rock scrambling, bushcraft, natural history and bush study and a problem-solving exercise related to wilderness-survival. Most of the students took part in all these activities.

The upper ability class was expected to cook their own meals over fires or on gas-burners. The low-ability students cooked their meals together as a group.

After the camp (and prior to the posttest) only the less able students spent classroom time discussing camp themes. One of their teachers gave a lecture on conservation and plant ecology.

Methods

Outcomes of this camp were assessed with the following instruments:

(1) the shortened Piers-Harris Children's Self Concept Scale;
(2) the Millward-Ginter Outdoor Attitude Inventory; and,
(3) the shortened Passineau Wilderness Attitude Scale.

It was felt that these measuring devices would give some indication of the degree to which the teachers' expectations were being realized.

At the posttest session the students were also asked to write down the event(s) they most remembered.
Experimental Design

A pre-post non-equivalent control design was again used for this experiment. A two-week interval occurred between pre and posttests. The tests were administered to the experimental group six days prior to and again six to seven days after the trip. The tests were easily completed within one class period.

I did not attend this particular camp. However, the previous year I participated in both the inservice O/E course for that school and the Form IV camp. The camp that I attended was structured in exactly the same manner as the one discussed in this experiment. I administered all tests and held informal interviews with the teachers both before and after the trip.

MANOVA and T-tests were used on the data of this experiment.

5.4.2 Results

Self Concept

The results of this scale are in accord with those obtained in the first Form IV experiment. No significant differences on the total self concept score were found between the experimental and control groups. This is true of both the lower and upper ability classes. (Refer to Table 5.8 and Figure 5.9). However, a change of some magnitude (i.e. approximately a 17% gain) was observed with the lower ability experimental class; the better experimental group showed no change. The gain was not statistically significant for two reasons. First, we are dealing with a small number of individuals (perhaps a more appropriate statistical test would have shown a significant gain). Second, the equivalent control group also showed some gain (viz, about 7%). (This control group may have changed somewhat in their self concept due to the presence of a new enthusiastic teacher - see experiment 3 for details).

The standard error of measurement (SEM) analysis also suggests that this lower ability camp group made a real gain in their self concept and not just a gain due to random error. A third of the individuals in the class showed a significantly higher self concept score on the posttest. This was the case for only 11% of the corresponding control group. It can be seen from Table 5.9 that compared to any of the other groups in this study, the lower ability experimental class had the greatest percentage of students changing in their self concept.
TABLE 5.8 Mean Self Concept Scores for the Form IV Experimental and Control Groups - Camp Two.

<table>
<thead>
<tr>
<th></th>
<th>LOWER ABILITY</th>
<th></th>
<th>LOWER ABILITY</th>
<th></th>
<th>UPPER ABILITY</th>
<th></th>
<th>UPPER ABILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Experimental (n=18)</td>
<td>Control (n=18)</td>
<td>Experimental (n=24)</td>
<td>Control (n=27)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PRETEST</td>
<td>24</td>
<td>5.68</td>
<td>28</td>
<td>6.28</td>
<td>30</td>
<td>5.34</td>
<td>28</td>
</tr>
<tr>
<td>POSTTEST</td>
<td>28</td>
<td>6.18</td>
<td>30</td>
<td>7.06</td>
<td>30</td>
<td>6.56</td>
<td>29</td>
</tr>
</tbody>
</table>

1. n = number of students used in the final analysis.
2. $\theta$ = standard deviation.

TABLE 5.9 Percentage of Students in All the Groups which Showed Significant Shifts in their Self Concept Scores.

<table>
<thead>
<tr>
<th>Percentage of class showing:</th>
<th>LOWER ABILITY</th>
<th></th>
<th>LOWER ABILITY</th>
<th></th>
<th>UPPER ABILITY</th>
<th></th>
<th>UPPER ABILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Experimental (n=18)</td>
<td>Control (n=18)</td>
<td>Experimental (n=24)</td>
<td>Control (n=27)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>significant gains</td>
<td>33%</td>
<td>11%</td>
<td>0%</td>
<td>3%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>significant losses</td>
<td>5%</td>
<td>17%</td>
<td>4%</td>
<td>3%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

MGOAI

There was also no significant differences between the experimental and control groups on the Outdoor Attitude Inventory. This applied to both the more able and less able groups on the total score and the subscale scores. These results are summarized in Table 5.10. Figure 5.10 shows the mean and range of total scores for each group. It should be remembered when interpreting the results of this scale, that both the lower ability camp and no-camp groups received some sort of "environmentally-oriented" treatment. Although it was not intended, the control group was exposed to a teacher who may have affected their outdoor attitude scores. This classroom "treatment" effectively caused a greater gain in their scores than the camp treatment.
FIGURE 5.9  Mean and Range of Scores on the Self Concept Scale for Form IV Experimental and Control Groups - Camp Two.
TABLE 5.10  Mean Scores on the Outdoor Attitude Inventory for the Form IV Experimental and Control Groups in Camp Two.

<table>
<thead>
<tr>
<th>(SUB)</th>
<th>MILLWARD-GINTER OUTDOOR ATTITUDE INVENTORY</th>
<th>LOWER ABILITY</th>
<th>UPPER ABILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>EXPERIMENTAL (n=18)</td>
<td>CONTROL (n=18)</td>
</tr>
<tr>
<td>Scale</td>
<td></td>
<td>&quot;x&quot;</td>
<td>&quot;σ&quot;</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>152</td>
<td>12.86</td>
</tr>
<tr>
<td>PRE</td>
<td></td>
<td>154</td>
<td>9.98</td>
</tr>
<tr>
<td>POST</td>
<td></td>
<td>56</td>
<td>5.98</td>
</tr>
<tr>
<td>ENVIRONMENT</td>
<td></td>
<td>58</td>
<td>6.15</td>
</tr>
<tr>
<td>POLLUTION</td>
<td></td>
<td>32</td>
<td>3.91</td>
</tr>
<tr>
<td>POST</td>
<td></td>
<td>33</td>
<td>4.13</td>
</tr>
<tr>
<td>EDUCATION</td>
<td></td>
<td>30</td>
<td>3.40</td>
</tr>
<tr>
<td>POST</td>
<td></td>
<td>30</td>
<td>3.69</td>
</tr>
<tr>
<td>SOCIALIZATION</td>
<td></td>
<td>33</td>
<td>3.27</td>
</tr>
<tr>
<td>POST</td>
<td></td>
<td>33</td>
<td>3.05</td>
</tr>
</tbody>
</table>
FIGURE 5.10  Mean and Range of Scores on the Outdoor Attitude Inventory for the Form IV Experimental and Control Groups - Camp Two.
Although no significant gains were observed on the total or subscale scores, individual items within the test did change significantly. Table E.4.1 in Appendix E lists these items. Items which changed significantly on the control groups' tests are listed in Table E.3.3 (Appendix E). These changes show that the less able experimental class may have reacted to their experience differently than the better students. For example, the lower ability class augmented (viz. 20-35% gain) their scores on four statements concerning protection of the bush and working toward a cleaner environment. On the other hand, the upper ability class changed positively (viz. 11-12% gain) on two items concerning their relationships with teachers, and on other items mostly concerning educational aspects of learning.

The SEM data for this scale showed that both these experimental groups made an equal number of gains and losses. (i.e., the number of students who made significant shifts in their scores was the same).

Wilderness Attitude

Once again, no significant differences were observed between the camp and no-camp groups in the more specific area of wilderness attitude. This is true of the two different ability groups. The scores for this scale are given in Table 5.11. Figure 5.11 compares the mean and range of scores between groups.

<table>
<thead>
<tr>
<th>W I L D E R N E S S A T T I T U D E S C O R E S</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOWER ABILITY</td>
</tr>
<tr>
<td>Experimental (n=18)</td>
</tr>
<tr>
<td>Control (n=18)</td>
</tr>
<tr>
<td>PRETEST</td>
</tr>
<tr>
<td>x</td>
</tr>
<tr>
<td>0</td>
</tr>
<tr>
<td>66</td>
</tr>
<tr>
<td>5.12</td>
</tr>
<tr>
<td>69</td>
</tr>
<tr>
<td>4.53</td>
</tr>
<tr>
<td>72</td>
</tr>
<tr>
<td>5.75</td>
</tr>
<tr>
<td>69</td>
</tr>
<tr>
<td>7.41</td>
</tr>
</tbody>
</table>
FIGURE 5.11  Mean and Range of Scores on the Wilderness Attitude Scale for the Form IV Experimental and Control Groups - Camp Two.
The SEM data for this scale suggested a slightly greater benefit for the less able camp participants as compared to the more able ones. Twelve percent of the former group showed an increase (six percent lost), whereas no students in the other group increased significantly on their scores (five percent lost).

**Questionnaire**

Students were asked to write down the one thing they most remembered about camp. Most of the upper ability group listed "the tramp" and/or the snowfight by the skihut. A few of the students also remarked on the friendliness of the group and the teachers, compared to what they had known in the classroom.

In the smaller less capable class, the remarks were much the same. The snow, the mountains, the kea birds and canoeing in snowy weather conditions appeared to provide the most enjoyment.

5.4.3 **Summary of Test Results for Form IV Camp Two Experiment**

(1) No significant differences were found between the experimental and control groups on the mean self concept scores; however, the lower ability experimental class showed a positive, but non-significant increase of 17% on the mean posttest score;

(2) no significant differences were found between the experimental and control groups on either the mean total or subscale scores of the Outdoor Attitude Inventory. However, the lower ability camp group may have shown a more favourable attitude toward certain environmental issues; and the upper ability camp group may have shown a greater appreciation of their teachers; and,

(3) no significant differences were found between the experimental and control groups on the Wilderness Attitude Scale. This was true of both the upper and lower ability students.
5.5 EXPERIMENT 5 - FORM VI CAMP

5.5.1 Background

Description of Study Group

The study population for this experiment was composed of highly motivated senior high school biology students, (average age = 16 years). Three classes (n=101) from a large urban co-educational school were to attend a four-day ecology field trip. The control group consisted of two biology classes (n=47) from a comparable high school that did not run a residential camp ecology programme at the Form VI level. However, most of the students of both groups had attended third and fourth form camps in previous years.

The Form VI O/E programme of this school had been developed and modified over several years to give a tightly organised on-site academic experience. The teachers who led the camp all taught biology and had been involved in the development of the programme. These teachers and students were reasonably well known to each other.

Statement of School Camp Objectives

One teacher on the camp expressed the following expectations of the resident field experience:

"(we) hope that the kids will appreciate the complexity and beauty of the mountain environment and they will develop a concern for conservation and wilderness protection".

In the survey of expected outcomes, however, the primary emphasis was on learning the practical skills and knowledge involved in ecological studies. The objectives were ranked in the following order:

1. greater knowledge of ecology, etc;
2. improved ability to work as a team member;
3. improved fitness and physical skills;
4. improved relationships with class members and with teachers;
5. increased confidence and maturity; and,
6. demonstrating conservation behaviour.
Description of Camp

The camp was held during the first week of school after the summer holidays. No precamp preparation took place. Each of the three classes spent four days in a mountain environment located in a National Park. The main theme of the field trip was alpine ecology.

Students lodged in modern well-equipped ski-huts. The camp participants spent most of their time in the outdoors working on assigned field studies which were to be completed during or after the camp. The only non-academic activity that was undertaken was an afternoon hike to a nearby summit.

Meals or activities were not planned by the students. The camp participants were assigned to teams and expected to rotate the cooking, washing and serving chores. Some free time was available to the students but most chose to work on their assignments during this time. The teachers were available for help or discussion.

Methods

The scales chosen for this experiment emphasized the measurement of environmental attitudes. Although the objectives of the camp were oriented toward environmental studies, they related more to cognitive (i.e., knowledge) and skill gains rather than affective (i.e., attitudes) outcomes. However, it was hypothesized that this type of O/E experience could change students' attitudes and preferences for wilderness and/or environmental activities. To assess whether this was the case, two instruments were selected for use with these students. They were Passineau's (1975) Wilderness Attitude and Environmental Concern Scales.

The specific intent of this experiment then, was to measure environmental attitudes. However, the "halo effect" around environmental issues could have been a notable problem with students of this age and academic ability. Therefore, it was important that the students were unaware of my intentions. To avoid this problem the following precautions were taken:

1. The scales were known to the students only as "scale 1" and "scale 2". The Environmental Concern Scale was administered prior to the Wilderness Attitude Scale as suggested by Passineau (1975);
the students were given the tests by a former teacher of the school, on the pretext that he was doing research on students' feelings on issues of general concern;

I attended the camp as a participant-observer, but the students did not know that I was involved in the research described to them previously;

the same scales were given to all the biology students again after the camp (whether they went to camp or not), by the same teacher as before. They were not told of the relationship of the tests to the O/E trip. It was said rather, that the second testing was necessary to prove the reliability and validity of the tests so that the results could be compared with those of American students. (The students were very co-operative and the tests were easily completed within a lecture period); and,

I returned to the school several weeks after the camp experience to interview the students and teachers. The students were then told of my involvement with the tests. The interviews were conducted mainly as a validation exercise, (details in Chapter 4), but I also asked the students a few questions about their feelings toward the O/E session.

**Experimental Design**

A pre-post non-equivalent control design was employed for this experiment. The interval between the testing sessions was approximately two weeks. All three experimental classes were given the scales two to six days before and four to ten days after their particular O/E experience. The intervals between the testing sessions and the camps thus differed for each experimental class, yet was unavoidable due to the lecture schedule of these students. To test for this possible discrepancy between groups, the results of the three classes were analyzed separately. In this way, differences between the effect of the three separate camp sessions could also be determined.

MANOVA was used to interpret the results (details in Chapter 4).

**5.5.2 Results**

A T-test analysis of the students' scores from the three different classes revealed that there were no significant differences between them. Therefore the three classes have been treated as one unit. Table 5.12 and Figures 5.12 and 5.13 give the results of this experiment.
No significant differences were found between the experimental and control groups on either scale. Both these scales are considered to be very homogeneous in item content (i.e., measure one construct only). For this reason, an analysis of individual items within the scales was not performed.

**TABLE 5.12** Mean Scores for the Environmental Concern and Wilderness Attitude Scales for the Form VI Experimental and Control Groups.

<table>
<thead>
<tr>
<th></th>
<th>ENVIRONMENTAL CONCERN SCALE</th>
<th>WILDERNESS ATTITUDE SCALE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Experimental (n=101)</td>
<td>Control (n=47)</td>
</tr>
<tr>
<td></td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>$\theta^2$</td>
<td>$\theta$</td>
</tr>
<tr>
<td>PRETEST</td>
<td>16</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>5.18</td>
<td>4.72</td>
</tr>
<tr>
<td>POSTTEST</td>
<td>17</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>6.32</td>
<td>4.85</td>
</tr>
<tr>
<td>PRETEST</td>
<td>137</td>
<td>134</td>
</tr>
<tr>
<td></td>
<td>14.21</td>
<td>14.64</td>
</tr>
<tr>
<td>POSTTEST</td>
<td>137</td>
<td>134</td>
</tr>
<tr>
<td></td>
<td>14.93</td>
<td>14.60</td>
</tr>
</tbody>
</table>

1. n = number of students in the final analysis.
2. $\theta$ = standard deviation.

Significant shifts on individual students' scores were determined with the standard error of measurement. This analysis also did not reveal any particular advantage of attending the camp as far as environmental attitudes were concerned. Both the experimental and control group students' scores had similar movement on the two attitude scales.

**Interviews**

Twenty camp-students attaining a range of high to low scores on the Environmental Concern Scale were selected for interviews. All except one felt that the camp was a good experience. Most considered that the most important outcome was learning of specific ecological knowledge through first-hand experience. About one third of these students mentioned the social aspect of the camp as an enjoyable means of learning to communicate and working
FIGURE 5.12  Mean and Range of Scores on the Environmental Concern Scale for Form VI Experimental and Control Groups.

FIGURE 5.13  Mean and Range of Scores on the Wilderness Attitude Scale for Form VI Experimental and Control Groups.
with others. One fifth specifically cited the physical exercise as an enjoyable aspect of the camp experience. One person only commented on his new interest in plants and the mountain environment, but this was not reflected as a significant gain on either of his scale scores.

5.5.3 Summary of Test Results of the Form VI Camp

The main outcome of this study is that: There were no significant gains in the environmental attitudes of Form VI students attending an O/E camp, as measured by Passineau's Environmental Concern and Wilderness Attitude Scales.

Brief Statement on Experiments 1 to 5

The outcomes of these five experiments tentatively suggest a number of important issues for the development of O/E in New Zealand. The next chapter discusses the results and implications of these studies. It is my hope that this discussion will provoke a positive critical inquiry into the current state of resident O/E by those involved with its development and implementation.
CHAPTER 6

DISCUSSION AND CONCLUSIONS

One important question emerges from this study and from the reviews of other studies; how effective is resident O/E? Does it lead to an improvement in self concept and social skills, and does it enhance students' attitudes toward the natural environment? This study has investigated the extent to which O/E is an effective way of changing these attitudes and perceptions.

Teachers who take students out for resident O/E believe that the experiences are educationally valuable. Some believe this very strongly. Yet the results of these experiments do not support the idea that O/E is a successful change-agent. With a small number of significant exceptions, the O/E programmes evaluated in this study failed to produce measurable changes in students' attitudes and perceptions of themselves, others and the outdoor/wilderness setting. What went wrong?

To answer this question, the camp programmes that did produce some change will be contrasted with those that did not. Where possible, the results of this study will also be compared with relevant findings of other investigators. In this way, some of the factors responsible for outdoor educational gains may be identified and used to improve future programmes.

In table 6.1 is listed a summary of all the experimental methods and results of this study. The purpose of the table is to enable the reader to refer back to a particular study as it is being discussed. Relevant data will also be inserted within the text for clarification of specific points. The discussion is divided into three sections; first, self concept; second, social skills; and third, environmental attitudes. Conclusions are then drawn. Comments on the methodology used in this study form the final section of this text.
### Table 6.1 Summary of the Characteristics, Outcomes, and Results of the Five Experiments, Conducted in This Study

<table>
<thead>
<tr>
<th>Academic Level</th>
<th>Standard IV</th>
<th>Form I</th>
<th>Form IV</th>
<th>Form V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Camp</td>
<td>Camp One</td>
<td>Camp Two</td>
<td>Camp One</td>
<td>Camp One</td>
</tr>
<tr>
<td>Group</td>
<td>Experimental</td>
<td>Control</td>
<td>Experimental</td>
<td>Control</td>
</tr>
<tr>
<td>No. of Students</td>
<td>24</td>
<td>25</td>
<td>24</td>
<td>18</td>
</tr>
<tr>
<td>Average Age</td>
<td>60</td>
<td>60</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Academic Ability</td>
<td>Mixed</td>
<td>Mixed</td>
<td>Mixed</td>
<td>Mixed</td>
</tr>
</tbody>
</table>

### Characteristics

- **Treatments**: Assessed for self-concept, social skills, outdoor learning, environmental concerns, and wilderness attitudes.

### Design

- **Experiments**: Pre-post non-equivalent control.

### Analysis

- **Analysis**: MANOVA, T-tests.

### Tool 1

- **Modified: Prepost-Harris Children's Self Concept** (55 items)

### Tool 2

- **Kidd-Under Outdoor Attitude Inventory** (62 items)

### Tool 3

- **Shortened Passmore Wilderness Attitude Scale** (10 items)

### Tool 4

- **Environmental Concern Scale** (12 items)

### Notes:

1. H.S. means "not significant" at the 0.05 probability level.
2. Prepost means significant change made between treatment conditions.
3. +5% or higher means significant change made during camp.
6.1 IS O/E A CHANGE-AGENT FOR SELF CONCEPT?

There are a number of factors which may possibly determine whether or not self concept improves through O/E experiences. Four such factors which were identified in this study are as follows:

(1) the age of the participants;
(2) the academic ability of the participants;
(3) the type of camp programme; and,
(4) the preparation before camp (i.e. "advanced organisers").

These will be discussed under their respective headings.

(1) Age

Only one experimental class of the six studied, demonstrated statistically significant gains in the postcamp mean self concept score. The average age of the pupils in this class was 10 years. Piers and Harris (1969), the designers of the scale used in this research, stated that self concept is more likely to change in children than in adolescents. (Piers and Harris did not define clearly the age at which childhood ends and adolescence begins). Williams (1975) cites 9 to 10 years as the age at which attitudes are most readily influenced, and his research results support this theory. On the other hand, Hill (1978) worked with students who were one to two years older and he did not find a change in the camp group's self concept. In this study, statistically significant gains occurred in groups of 9 to 10 year old children but not with 14 to 15 year old groups of students.

(2) Ability

A comparison of the results from low-ability and high-ability Form IV groups tends to reinforce the above finding. In this study, one class of low-ability 14 to 15 year old students showed a large change (17% gain) in their mean self concept scores as a result of a camp experience. The better class showed no self concept gain from an identical camp programme. These results are restated below.
It is generally believed that the low-ability child has a mental age which is lower than his chronological age. This result, then, is in accord with the first finding (above) about age, (i.e., younger students exhibit greater changes of self concept). An alternative explanation to this is that the low self concept of a less able student (who experiences repeated classroom failure) "recovers" somewhat during an extended out-of-classroom encounter.

(3) **Camp Programme**

The self concept of lower ability students may not always change as a result of a camp programme. While it was noted above that one such class made a large gain, two other lower ability classes did not (refer below). This may be due to the differing types of camp programmes. The camp two students experienced a certain degree of risk; the weather was inclement, the environment rugged and the activities challenging. In contrast, the two other low-ability classes experienced good weather, a less challenging environment and relatively undemanding activities.

Risk activities are typically offered by "Outward Bound School" type programmes in which positive changes in self concept are an important intended outcome. The challenges presented to the camp one, low-ability class may have been insufficient to positively increase their self concept.
Younger students may also be particularly responsive to challenging experiences. Two events in particular may have contributed to a significant gain in the self concept of one Standard IV class but not the other, (refer below).

| STANDARD IV |  |
|-------------|  |
| Camp One    | Camp Two |
| Pre         | Post     |
| 37          | 39*      |
| Pre         | Post     |
| 38          | 39       |

1. Scores for both groups represent the results from a pretest before camp and a posttest two weeks later.

These events were a "prowler" incident and fitness work which the children were required to do during camp. The first was an experience that frightened the children. A masked "prowler" (unintentional on the part of teachers) repeatedly terrified the children on several evenings. By the end of the camp, the class as a whole had overcome their fear of this intruder and even began to plan means with which they could play tricks on him. Overcoming this fear or challenge may have strengthened the confidence of these children.

The fitness work which this group participated in may have been another cause of change in their self concept. Body image and awareness through movement are considered to be at the origin of self concept (Snodgrass, 1977, p.22). The twice-daily run around the racecourse and the free time spent in the adventure playground may have effected some change of body image. By the end of the camp, every child had improved his jogging time and many began to mention this activity with increasing pleasure as the camp progressed. It became an enjoyable source of challenge.

(4) "Advanced Organisers"

Another factor, however, may be more influential in changing self concept than any of the other factors. This is precamp preparation or "advanced organisers". The term "advanced organisers", as defined by Howie (1972, p.67), deals only with cognitive gains: they are a set of preparatory classroom exercises that form a cognitive framework into which most of the outdoor experiences would fit. There is evidence from this study, and from
the literature, (e.g., Berry, 1973; and Williams, 1975) that the concept of advanced organisers applies to more than cognitive gains.

For example, in this study precamp preparation caused a significant change in the self concept of one of the Standard IV classes before the camp (refer below).

<table>
<thead>
<tr>
<th>STANDARD IV CAMP TWO</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEFORE CAMP GAIN</td>
</tr>
<tr>
<td>6% *¹</td>
</tr>
</tbody>
</table>

1. * means statistically significant at the 0.05 probability level.

Howie, demonstrated that an outdoor experience with advanced organisers was only marginally more effective than a classroom only strategy. His findings concur with the affective outcomes of this Standard IV class. The results of this experiment (No.2) suggest that the lead-up programme was more effective in producing change than the actual camp experience.

Berry's (1973, p.69-70) results are interesting in this context. She found that the most effective lead-up programme in changing children's self concept consisted of discussion and audio-visual techniques. Williams' (1975) study also suggested that this type of approach is effective. The positive self concept outcomes of the NEED programme which Williams evaluated, may have been partially attributed to advanced organisers (predominantly audio-visual) prepared especially for the NEED camps.

6.2 IS O/E A CHANGE AGENT FOR SOCIAL SKILLS?

The measurement of social skills in this study is limited to one subscale containing eight items. However, the test results are compared with subjective observations based on the children's, the teachers' and my own perceptions of what occurred during camp. Conclusions about changes in social skills should be treated as tentative only. Three factors appeared to have some influence:
the classroom structure;
(2) the ability of the camp participants; and,
(3) the type of camp experiences.

Each will be discussed separately.

(1) Classroom Structure

One of the Standard IV classes (camp one) studied, was from an open-plan school. Most of the pupils were assigned to their teacher for three consecutive years. We might expect the relationships between teacher and students to be well-established, both as a consequence of the open classroom atmosphere and the length of the relationship. In fact, these children did not change on any of the items concerning social skills (i.e., peer and teacher relationships, or working with classmates). Carlson (1973) similarly did not find any changes in "perceptions of peers" of camp participants who were from an ungraded classroom.

On the other hand, the second Standard IV class (camp two) did make significant gains on items concerning their feelings toward teachers. In this case, the classroom was traditional and the relationship between teachers and students, relatively formal. Again, as for the self concept gains in this class, the increase on teacher-items was caused solely by classroom preparation for the camp (see chart below). However, they did not decrease their scores after the camp, suggesting that the children's expectations in this respect were met.

<table>
<thead>
<tr>
<th>TEACHER/STUDENT RELATIONSHIPS</th>
<th>STANDARD IV CAMP TWO</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BEFORE CAMP GAIN</td>
</tr>
<tr>
<td>Item 1</td>
<td>0.50 (22%)</td>
</tr>
<tr>
<td>Item 2</td>
<td>0.45 (20%)</td>
</tr>
</tbody>
</table>

(2) Ability

Teachers of low-ability groups tend to be selected for their ability to form good relationships with students. This may explain why none of the three low-ability Form IV classes (total n=48) showed significant increases on items relating to teacher/student rapport. On the other hand, the upper ability Form IV group (n=24), showed a positive significant gain on items
referring to teachers. This group's test results are also in accord with
the comments offered by the students. One of the remarks was that the
students were surprised at "... how good the teachers were (on camp)...".

(3) Camp Experiences

The two classes (i.e., one Standard IV and one Form IV) that changed
on items referring to their relationships with teachers had a number of camp
experiences in common. For example, in both cases the teachers and students
socialized together at mealtime and during freetime. This sharing of common
living experiences (e.g., eating, playing) was generally less evident among
the camps that did not produce changes in attitude toward teachers. This
observation suggests that the teacher must work at relating to the children
both personally and professionally.

The Christchurch teachers responding to the survey conducted for this
study, seemed to be in disagreement over the importance of resident O/E in
furthering student/teacher relationships. Yet the results of this study
suggest that it is one area of real potential. Further attention should
perhaps be awarded to it.

Vogan (1970, p.124) also supports this notion. She says:

"It can no longer be assumed that (a) positive change in (student/
teacher) relationships will occur automatically".

She found in her evaluation of camps that there was a lack of emphasis in
furthering a positive rapport between pupils and their teachers. Vogan
listed eight areas in which teachers could make a more concerted effort.
She suggested that they should:

(1) gain a positive feeling regarding the O/E experience;
(2) work with students in:
   (a) general planning,
   (b) determining goals and behaviour,
   (c) planning use of facilities, and,
   (d) considering questions of evaluation;
(3) contribute to the outdoor experience both personally and professionally;
(4) be an active learner during the event;
(5) encourage "openness" in conversation with students;
(6) use time more effectively;
(7) dispense with classroom routines; and,
extract and use new ideas in the classroom (i.e., use O/E as a change-agent for classroom process and programme).

Criteria for achieving these eight objectives are outlined in Vogan's study (ibid, p.163-167).

Teachers frequently mentioned improved group cohesiveness as a social outcome of camp experiences. Group cohesiveness, for the purposes of this study, means attraction for working with other members of the group. Items on the Outdoor Attitude Inventory that dealt with this outcome however, did not show any significant changes. This was the case for all of the Standard and Form IV experimental groups.

There are two plausible reasons for the discrepancy between teachers' reports and the psychometric results in this respect. The first is that the number and types of items in the test dealing with group cohesiveness were insufficient to detect any changes. The second is that there was little measurable change. Both explanations probably have some truth. In either case, the potential of O/E for improving group cohesiveness may not be fully realized.

Berry (1973, p.29) suggested in her study that an "Action Socialization Experience" (viz., a problem-solving obstacle course which requires group participation and co-operation) was successful in improving group cohesiveness. Further investigation is necessary to determine the change-agents involved in this social skill. In addition, tools for its effective measurement are not readily available.

The need for further development and evaluation of the general area of social skill outcomes emerges from this discussion. Outdoor educators may not be achieving what Julian Smith (1957, p.51) said should be achieved:

"One of the significant benefits that comes to teachers and pupils who share in vivid and adventurous experiences that outdoor education offers is that of a better understanding of each other".
6.3 **IS O/E A CHANGE-AGENT FOR ENVIRONMENTAL ATTITUDES?**

In this study, the measurement of environmental attitudes was generally restricted to children's perceptions of the natural environment. Once again, measurable positive outcomes were few. The chart below reiterates some of the results found with the experimental groups.

<table>
<thead>
<tr>
<th></th>
<th>STANDARD IV</th>
<th></th>
<th>FORM IV</th>
<th></th>
<th>FORM VI</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CAMP ONE</td>
<td>CAMP TWO</td>
<td>CAMP ONE</td>
<td>CAMP TWO</td>
<td>CAMP ONE</td>
<td>CAMP TWO</td>
</tr>
<tr>
<td></td>
<td>Pre</td>
<td>Post</td>
<td>Pre</td>
<td>Post</td>
<td>Pre</td>
<td>Post</td>
</tr>
<tr>
<td>OUTDOOR ATTITUDE</td>
<td>98</td>
<td>101</td>
<td>106</td>
<td>105</td>
<td>152</td>
<td>154</td>
</tr>
<tr>
<td></td>
<td>150</td>
<td>156</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>WILDERNESS ATTITUDE</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>66</td>
<td>64*4</td>
</tr>
<tr>
<td></td>
<td>69</td>
<td>69</td>
<td>137</td>
<td>137</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENVIRONMENTAL CONCERN</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>16</td>
<td>17</td>
</tr>
</tbody>
</table>

1. Standard IV and Form IV students rated the items on a different numbering scale and their scores are therefore not comparable.
2. Camp Two Outdoor Attitude Scores are combined Lower and Upper Ability Groups.
3. Form IV and Form VI had a different number of items on this scale, and their scores are therefore not comparable.
4. The only significant change was a decline in scores.

A number of factors, however, of possible influence in bringing about change in environmental attitudes have been identified:

1. Prior classroom exposure to environmental ideas;
2. emphasis on natural environment and conservation themes during camp; and,
3. appropriate outdoor teaching strategies.

These factors are elaborated below:

1. **Prior Classroom Exposure**

The effect of precamp classroom work has already been discussed in relation to self concept. The Standard IV class that received prior classroom discussion on conservation and wilderness, etc., also made significant gains on the Outdoor Attitude Scale before the camp but not during the camp.
Classroom work alone, may also be sufficient to change the environmental perceptions of certain students. Certainly Howie (1972) found this to be true. In this study, the one class (i.e., Form IV low-ability) that made significant gains was a control group that received no camp experience. They did, however, receive in-class discussion on environmental themes by an outdoors-oriented teacher. Another possible explanation for these gains is that low-ability students are more apt than upper ability students to adopt the perceptions of a teacher which they respect.

Postcamp classroom discussion may also influence students attitudes, but possibly to a lesser extent than precamp discussion. One lower ability experimental group (camp two) made gains (20 to 35%) on some of the Environment and Pollution subscale items. This may possibly be attributed to a lecture on conservation and plant ecology given by a well-liked teacher after the camp but prior to the posttest. Since the information was not presented before the camp however, the students may not have been as receptive to environmental themes on camp as they could have been. They did not change therefore on their total scores. In a similar connection, Maher and Bycroft (unpublished, p.18) make reference to the importance of the "... readiness of the target groups to accept and relate to the information provided". This need for readiness for the outdoor experience is becoming a consistently repeating theme in this discussion.

There is further support of the importance of advanced organisers on environmental attitudes. With the exception of the two groups mentioned, no other Form IV or Form VI classes experienced precamp classroom activity related to environmental themes. Neither did these groups make positive changes on the attitude scales related to the outdoors, wilderness or environmental issues. This is summarized below.
These results also generally agree with those of Clifton (1981) who similarly assessed Form IV students' (n=47) wilderness attitudes. He found that students receiving a precamp lecture on conservation in national parks by their teacher, showed a significant gain in their attitude toward protection of national parks. Other groups receiving no such talk did not significantly change in this respect.

The available evidence on the effect of resident O/E on environmental attitudes so far suggests an important finding. These programmes may be as effective or less effective than classroom teaching in developing environmental attitudes. There may be, however, two other important factors involved in the rather limited environmental outcomes of these school camps.

(2) Emphasis on Conservation Themes

One of these, is that there was very little emphasis on events during the camp programmes that would stimulate positive feelings toward the outdoors. There was also often a lack of concern by teachers for the picking of plants, leaving unattended camp fires, wasteful use of plant and animal specimens, etc. The development of positive attitudes toward conservation may be an area where actions or negligence (by teachers) speak louder than words.
(3) **Teaching Strategy**

The third factor that may be responsible for negligible environmental attitude outcomes in this study is the lack of an appropriate teaching strategy. An appropriate pedagogy for the outdoors has frequently been alluded to in the literature as being fundamental to the achievement of O/E objectives (i.e., not only related to environmental study objectives). Vogan (1970), Berry (1973), Carlson (1973), Millward (1973) and Williams (1975) have all made reference to the importance of the teaching methodology used in O/E.

It is not possible for me to introduce an extended discussion of exactly what is an appropriate teaching approach for the outdoors. However, Millward (ibid) suggests that it has to do with attitudes and values. (A value develops after the attitude is formed). He suggests that to influence attitudes the individual must be exposed to the psychological object in a non-threatening environment. Then, the person must be given "...the opportunity to become involved, to act, to verbalise support and to acquire a cognitive framework toward the psychological objects". (ibid, p.157).

Classroom teaching has been dedicated to the transfer of facts and concepts. Teachers, therefore have limited experience in the area of values and attitudes. The term "acclimatization" has been used in reference to the teaching of environmental awareness and appreciation. Van Matre (1972) has developed this theory of acclimatization and it has since, been widely applied to O/E in North America. It could also be incorporated into New Zealand programmes and then evaluated for its effectiveness. The NEED programme (refer to Williams' study in section 3.2.2 of this document), may also serve as a model for the development of New Zealand O/E programmes that would be capable of incrementing attitudes of environmental concern.

6.4 **CONCLUSIONS**

The main conclusion that emerges from this study is that the resident O/E programmes evaluated, appeared to produce few measurable positive outcomes. More specific conclusions are listed below:

(1) School camps were largely unsuccessful in producing measurable gains in self concept. The range of gains that was made was of the order of 5 to 17%, and,
the self concept of children in the 9 to 10 year age bracket in particular, appears to be most readily influenced by camp experiences;

the self concept of lower ability students may be more readily changed than the self concept of upper ability students as a result of camp experiences;

the self concept may be enhanced by coping with challenging or frightening experiences;

the self concept of 9 to 10 year old children in particular may be enhanced by body awareness experiences, particularly if they are able to see measurable progress in their fitness and body co-ordination (i.e. success); and,

self concept gains may be promoted by the presence of appropriate "advanced organisers". The nature of advanced organisers for self concept gains remains unclear.

(2) Resident O/E programmes did not produce measurable gains in either peer relationships or group cohesiveness, however,
    - problem-solving exercises may be a means of enhancing group cohesiveness.

(3) School O/E experiences did appear to improve the student/teacher relationships of some classes. The gains were limited to students of average and above academic ability from traditional classroom situations, and,
    - sharing of common living experiences between teachers and students during camp may have been one of the most important factors in improving these relationships.

(4) Resident camps appeared to be ineffective in changing students' environmental attitudes. The reasons for this failure were tentatively identified as:
    - lack of precamp exposure to environmental themes such as conservation, wilderness, land development, etc.;
    - lack of emphasis on environmental concepts and responsibilities during camp; and,
    - lack of an appropriate teaching strategy for the outdoors which among other things, emphasizes attitude change and environmental sensitization experiences.
Finally, in view of the time and resources currently spent, together with the limited outcomes from these camps, a re-examination of what is best learnt on the school site and what is best learnt in a "wilderness" setting is in order.

6.5 COMMENTS ABOUT THE SPECIFIC INSTRUMENTS USED IN THIS STUDY

The problem of response set was evident in the attitude scale results of this study. The most apparent type of response set was the "halo effect" around outdoor education, pollution and wilderness concepts. This was found to be the case in the literature as well. Millward's (1973) results suggest that the halo effect around outdoor education concepts was more pronounced in his study than in this investigation. Millward's students were younger (equivalent to Form I) but their scores were 5 to 10% higher than the scores of average to above average Form IV students tested in this study.

Response set toward specific environmental issues may not yet be a problem in New Zealand. Senior high school biology students obtained a very high mean "wilderness attitude" score but did not obtain a comparably high "environmental concern" score. These students may actually be less concerned about general environmental issues than they are about wilderness protection. Or, an alternative explanation is that the Environmental Concern Scale was less obtrusive in terms of what it was measuring than the Wilderness Attitude Scale. The technique of using forced-choice items was applied in the Environmental Concern Scale. An example of this was "I would rather give $5 to,

(a) the Prime Minister's committee on Energy Conservation,
(b) the Prime Minister's committee on Crime Prevention".

The use of forced-choice items may have reduced the social desirability problem as it is suggested that it may do by authors involved with attitude scale construction.

However, the halo effect around environmental issues other than wilderness protection is likely to increase in New Zealand. Maher (1980) found that subjects responding to an environmental attitude scale in Australia in 1977 had considerably higher mean scores than a comparable group's scores measured three years earlier. Awareness of environmental issues apparently had became more pronounced in Australia in the three-year interval between experimental testing sessions.
Environmental issues are at present gaining increasing attention in New Zealand also. If evaluation is to continue in O/E in this country, ways of overcoming the halo effect in environmental attitude measurement must be applied. One promising way of doing so is through the use of unobtrusive tests such as word-association tests, semantic differential techniques, etc. Moyer (1975) and Born and Weiters (1978) have devised two apparently valid and reliable instruments for assessing environmental attitudes. (Unobtrusive tools for measuring self concept also exist, e.g., Instructional Objectives Exchange (1979) has recently constructed one). These tools could serve as models for a range of New Zealand research instruments for evaluation in O/E. In addition, other non psychometric devices should be applied in conjunction with attitude scales or other tests. Dyar's (1975) study is a good example of combining psychometric techniques with other measuring devices to assess environmental attitudes.

6.6 RECOMMENDATIONS FOR FURTHER RESEARCH

The need for effective evaluation has become apparent through this study. Below are suggestions for investigations which I feel would be valuable for the development of good educational programmes (outdoor or otherwise):

(1) The potential for an "outdoor teaching" strategy should be determined. An O/E programme could be designed around explicit objectives, incorporating some of the suggestions made in this study. A comparison of the outcomes of current programmes against those that require more careful planning, could then be made.

(2) The nature of effective "advanced organisers" for self concept and environmental attitude change should be determined. Various lead-up programmes could be designed and applied to different classes attending the same camp. The results from each group could then be compared.

(3) The influence of O/E experiences on student behaviour should be investigated. This could be done with:
   (a) low-ability students; and,
   (b) other children with classroom behaviour problems.

(4) The success of different types of O/E programmes on social skill development could be better determined.
The relative effectiveness of programmes requiring different amounts of effort and resources should be studied. The following incorporate this dimension of O/E evaluation:

(i) A school site resident programme and a wilderness site resident programme could be contrasted for their achievement in:
   (a) - improving self concept; and/or,
   (b) - developing social skills such as class relationships, teacher/student rapport and group cohesiveness;

(ii) A day trip and a resident wilderness trip could be compared for their success in promoting:
   (a) - wilderness protection attitudes and/or behaviour;
   (b) - enjoyment of wilderness experiences; and,
   (c) - appreciation of outdoor recreation activities, etc.;

(iii) An indoor and an outdoor environmentally-oriented programme could be compared for their effectiveness in:
   (a) - increasing environmental knowledge and skills; and/or,
   (b) - promoting positive environmental attitudes and behaviour.

The assessment of students' actual versus their reported environmental attitudes may be warranted. Students' environmental attitude scores from obtrusive measures (e.g., the ones used in this study) could be compared with their scores from unobtrusive measuring instruments.

Pictorial or other non-verbal objective attitude scales could be developed for low-ability and younger students.

Effective attitude measurement scales could be designed to measure environmental concerns particular to New Zealand.
ACKNOWLEDGEMENTS

I would like to extend my sincere appreciation to my supervisor, Graeme Scott, who was always ready to listen and advise. His guidance in this study was consistent and thought-provoking.

My warmest appreciation goes to the director of the Joint Centre for Environmental Sciences, Dr. John Hayward, for his unwavering enthusiasm and support during my stay in this department.

Many principals and teachers offered their co-operation and interest in this investigation. In particular are those teachers who willingly gave of their time for the experimental work. They include: Robyn Besley, Gwenneth Tinkler, Ray Marks, Jennifer Phemalton, Euen Godfrey, Dick Weathy, Don Reid, Murray Allison and Malcolm Anderson. I am also appreciative of the warmth and friendliness accorded to me by all the teachers and students at the school camps which I attended.

My thanks are extended to Brian Lodge, David Adams, Ross Dowling and Warren Jowett for their help and thought-provoking discussion on outdoor and environmental education.

Equally as important as teachers were the students involved in my research. Without their honest efforts and co-operation, this study would not have been possible.

Brian Keeling, Brian Tuck and David Hughes were particularly helpful with the research design and statistical analyses used in this study. Thank-you also to other staff in the Education Department for their help.

I would also like to acknowledge my classmates - all of whom were a source of continuous support and friendship throughout our two years of study together.

My thanks are extended to Beryl Nottingham, for her excellent typing of this manuscript.

Finally, I would like to thank my husband, Joe. His patience and
understanding of what this study has involved is deeply appreciated. He also gave me invaluable advice and expertise in many of the finer points of this thesis.
REFERENCES


61. VAN METER, D. E. 1972. Attitudinal changes in selected sixth grade students participating in Indianapolis Public School Recreational Outdoor Programs. Muncie, Indiana: Ball State University, Natural Resources Institute.


64. WILLIAMS, R. A. 1975. The effects of the National Environmental Education Development program on self-concept and change of environmental attitudes of selected elementary school students. Thesis, Ph.D., Georgia State University. University Microfilms 7529909.


### APPENDIX A.1

#### A.1  CHRISTCHURCH SCHOOLS PARTICIPATING IN SURVEY OF O/E OUTCOMES

<table>
<thead>
<tr>
<th>PRIMARY</th>
<th>Hornby Primary</th>
<th>St. Albans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allenvale</td>
<td>Ilam</td>
<td>Stockburn</td>
</tr>
<tr>
<td>Aorangi</td>
<td>Kendal</td>
<td>Somerfield</td>
</tr>
<tr>
<td>Aranui</td>
<td>Ladbrooks</td>
<td>South Hornby</td>
</tr>
<tr>
<td>Avondale</td>
<td>Linwood Avenue</td>
<td>South New Brighton</td>
</tr>
<tr>
<td>Avonhead</td>
<td>Linwood North</td>
<td>Spreydon</td>
</tr>
<tr>
<td>Bamford</td>
<td>Mairehau</td>
<td>Sumner</td>
</tr>
<tr>
<td>Banks Avenue</td>
<td>Northcote</td>
<td>Sydenham</td>
</tr>
<tr>
<td>Bishopdale</td>
<td>Oruhia</td>
<td>Templeton</td>
</tr>
<tr>
<td>Broadfield</td>
<td>Papanui</td>
<td>Thorington</td>
</tr>
<tr>
<td>Burwood</td>
<td>Paparoa</td>
<td>Waimairi</td>
</tr>
<tr>
<td>Elmwood Normal</td>
<td>Redwood</td>
<td>Wairakei</td>
</tr>
<tr>
<td>Fendalton Open Air</td>
<td>Riccarton</td>
<td>Waltham</td>
</tr>
<tr>
<td>Freeville</td>
<td>Richmond</td>
<td>West Spreydon</td>
</tr>
<tr>
<td>Gilberthorpes Road</td>
<td>Rowley</td>
<td>Wharenu</td>
</tr>
<tr>
<td>Glenmoor</td>
<td>Roydvale</td>
<td>Windsor</td>
</tr>
<tr>
<td>Harewood</td>
<td></td>
<td>Woolston</td>
</tr>
</tbody>
</table>

| INTERMEDIATE                 | Heaton               | North New Brighton    |
| Beckenham                    | Kirkwood             | Oaklands              |
| Breen's                      | Linwood              | Opawa                 |
| Briggston                    | Manning              | Oxford Area           |
| Casebrook                    | Marshlands           | Queenspark            |
| Chisnallwood                 | Merrin               | Redcliffs             |
| Halswell                     | Mt. Pleasant         | Xavier Intermediate College |

| SECONDARY                    | Hagley               | Papanui               |
| Aranui                       | Hillmorton           | Rangi Ruru            |
| Avonside Girls'              | Hornby               | Riccarton             |
| Burnside                     | Kaiapoi              | Sacred Heart College  |
| Cashmere                     | Lincoln              | St. Andrew's College  |
| Christchurch Boys'           | Mairehau             | St. Bede's College    |
| Christchurch Girls'          |                      | Villa Maria College   |
| Christchurch S.D.A.          |                      | Shirley Boys'         |
| Four Avenues                 | McKillop College     |                       |
Three post-graduate students from the Joint Centre for Environmental Sciences at Canterbury University are currently writing theses in the field of outdoor education. As part of this project, they need to obtain some information on sites used by schools for outdoor education, and teachers' reasons for undertaking outdoor education. They have developed a questionnaire which has been sent to recommended teachers in primary, intermediate and secondary schools in Christchurch. A copy of the letter of introduction and the questionnaire is attached.

This letter is to inform you that of your staff is one of our selected teachers. Should you wish to discuss the responses made on behalf of your school or to recommend that the questionnaire be completed after discussion with other staff members, we would be pleased if you did so. Our proposed investigations have been discussed with senior members of both the Canterbury Education Board and the Southern Regional office of the Department of Education and have received their approval. It is our hope that this project will result in information that will enable all schools to plan and conduct better programs in outdoor education.

Should you have any questions concerning this survey, please phone me. My office number is 482-009 (University of Canterbury) extension 8975.

Yours sincerely,

Graeme Scott
Research Fellow in Environmental Education
A SURVEY OF OUTDOOR EDUCATION IN CHRISTCHURCH SCHOOLS

This letter is a request to take part in a postal survey which is aimed at clarifying some issues involved in outdoor education in Christchurch. Your colleagues have recommended you to us as a teacher who has shown considerable interest in this educational field. The survey is being conducted on behalf of three post-graduate students of the Joint Centre for Environmental Sciences, at Canterbury University. Each of these students has decided to write a thesis in the field of outdoor education. We anticipate that completing the attached questionnaires will take about ½ - 1 hour. A courtesy letter has been sent to your principal/headmaster to inform him/her that this contact has been made and the reasons for it.

If you agree to take part in this survey, please read the introduction first, and then complete each of the four attached questionnaires. Please return the completed questionnaires to us as soon as you can, if at all possible by Friday, the 19th October. A stamped addressed envelope is included.

In anticipation of your reply, may we thank you for your assistance with this project, and express our hope that the investigations that flow from this survey will help schools to undertake more and better programs in the field of outdoor education.

Yours sincerely,

[Signatures]
QUESTIONNAIRES

The following four questionnaires deal with out of classroom trips of any duration to wilderness areas. We consider "wilderness areas" to include national and forest parks, rivers, beaches, areas of bush, etc. We consider that it excludes trips to the Museum, Ferrymead, Botanic Gardens, Orana Park, other schools, historical sites, fire stations, farms, sewage ponds, etc.

QUESTIONNAIRE 1

1. When is your next field trip?

2. Where will you be going on your next field trip?

3. How many students will be attending the field trip and what grade level will they be?

4. For what reasons was the site chosen?

5. What activities will be emphasised?

6. Would you be prepared to permit a student to attend this trip and if necessary to administer some tests to pupils who took part?
QUESTIONNAIRE 2

Questionnaire 2 deals with the use of Arthurs Pass National Park as an outdoor education site. If you have never used Arthurs Pass go straight on to Questionnaire 3.

Please consider all your teaching experiences in Arthurs Pass National Park in answering the following questions.

1. What age groups have you taken to Arthurs Pass National Park?

2. Considering Arthurs Pass National Park as an outdoor education site:
   (a) What advantages does it have that are not available at other sites?
   (b) What disadvantages does it have?

3. Have you stayed overnight at Arthurs Pass National Park with a school group, and if so where?

4. Have you encountered problems in obtaining overnight accommodation at Arthurs Pass National Park?

5. With regard to the length of your trips, have you stayed
   - [ ] 1 day
   - [ ] 2 days
   - [ ] 3 days
   - [ ] 4 days
   - [ ] 5 days or more
6. Does your class visit Park Headquarters?
   - always
   - sometimes
   - never

7. Do you contact Park Headquarters before arrival?
   - yes/no

8. Do you receive assistance from Park Rangers?
   - always
   - sometimes
   - never

9. Is this assistance in the form of:
   - advice with possible activities
   - talk to class
   - guided walk
   - other (please specify)

10. If you have received no assistance from Park Rangers would you welcome assistance?
    - yes/no
**QUESTIONNAIRE 3**

Questionnaire 3 deals with the outcomes that you as a teacher expect your students to obtain from outdoor education.

**Instructions**

To assist you in answering the following two questions we have provided a list of possible answers.

**Questions**

1. What do you believe pupils gain from outdoor education experiences in general?

   (a) Read the list of possible answers, and add to it other answers that you would like to make.

   (b) Then, considering the total list (our answers and yours), rank them in order by placing a (1) beside the outcome that you consider most likely to come about, a (2) beside the outcome that you consider second most likely to come about, and so on until every answer has a number beside it.

<table>
<thead>
<tr>
<th>RANK</th>
<th>POSSIBLE OUTCOMES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>improved relationships with other class members</td>
</tr>
<tr>
<td></td>
<td>improved self concept (sense of personal worth)</td>
</tr>
<tr>
<td></td>
<td>learning to enjoy wilderness experiences</td>
</tr>
<tr>
<td></td>
<td>greater knowledge of nature study, ecology etc.</td>
</tr>
<tr>
<td></td>
<td>improved fitness and physical skills</td>
</tr>
<tr>
<td></td>
<td>exposure to a wider range of experiences</td>
</tr>
<tr>
<td></td>
<td>ability to work as a team member</td>
</tr>
<tr>
<td></td>
<td>increased confidence and maturity</td>
</tr>
<tr>
<td></td>
<td>improvement in behaviour of badly-behaved students</td>
</tr>
<tr>
<td></td>
<td>improved relationships with teachers</td>
</tr>
<tr>
<td></td>
<td>learning possible leisure time activities</td>
</tr>
<tr>
<td></td>
<td>demonstrating conservation behaviour</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2. Bearing in mind that outcomes are determined to some extent by the types of activities performed on the field trip and the type of environment visited, what do you believe your students will gain from your next field trip? (It may be helpful to consult the list of possible outcomes on the previous page.)
This questionnaire deals with the sites that are currently being used by Christchurch schools for outdoor education and those that could be used in the future.

1. (a) Do you see your school's outdoor education program as likely to expand in the future [ ]

continue at the current level [ ]

be reduced in the future [ ]

(b) If you answered "reduced in the future" give reasons why you believe this is likely to happen:

- 
- 
- 

2. Please complete the following table by listing all outdoor education trips that you have been (or will be) involved in during the 1979 school year.

<table>
<thead>
<tr>
<th>Site</th>
<th>Length of stay</th>
<th>Number of pupils</th>
<th>Date (approx)</th>
</tr>
</thead>
</table>

3. If you were planning a 1 day trip what is the maximum one-way travelling time that you would consider?
Questionnaire 4 continued

4. If there were such a thing as an ideal site what would it offer?

To assist you in answering this question we have provided a list of possible answers.

(a) Read the list and add to it any other criteria you think important.

(b) Then, considering the total list (both our answers and yours) rank them in order by placing a 1 beside the criteria that you consider most important, or 2 beside the criteria that you consider second most important and so on, until every answer has a number beside it.

<table>
<thead>
<tr>
<th>RANKING</th>
<th>SITE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>- safety</td>
<td></td>
</tr>
<tr>
<td>- facilities such as toilets, shelter and drinking water</td>
<td></td>
</tr>
<tr>
<td>- whether site is sufficiently stable to withstand continuing educational use</td>
<td></td>
</tr>
<tr>
<td>- size of site</td>
<td></td>
</tr>
<tr>
<td>- accessibility to main transport route</td>
<td></td>
</tr>
<tr>
<td>- range of teaching experiences it offers</td>
<td></td>
</tr>
<tr>
<td>- topography of site (flat or hilly)</td>
<td></td>
</tr>
<tr>
<td>- whether it offers a degree of risk experience appropriate to the child's level of physical development</td>
<td></td>
</tr>
<tr>
<td>- whether it offers a unique experience</td>
<td></td>
</tr>
<tr>
<td>- types of plants and animals (specific types for teaching activities)</td>
<td></td>
</tr>
<tr>
<td>- variety of plants and animals (the range suitable for more than one teaching activity)</td>
<td></td>
</tr>
<tr>
<td>- degree of wilderness</td>
<td></td>
</tr>
<tr>
<td>- potential for teaching geographical themes (landforms, soils etc.)</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX B.1

B.1 SEMANTIC DIFFERENTIAL SCALE USED FOR METHODS TRIAL - FORM IV STUDENTS

How would you rate these statements?

Instructions:

Starting with the first statement below, mark an x in one box per pair of descriptive adjectives indicating how you feel about "getting along with your classmates" (first statement). If you feel very strongly about it either way, mark the extreme left-hand box or extreme right hand box, whichever is appropriate. If you do not feel very strongly, mark a box somewhere in between the two extremes. For example if you feel it is quite important you would mark the second closest box to the word important. If you cannot make up your mind, mark the centre box. Continue for all adjectives and then do the same for the second statement, and so on until you have "rated" statements one to fifteen.

Note that the adjectives are not always set up in the same way for each statement, so read carefully.

Statements:

(1) Getting along with classmates.
(2) Learning what I am good and bad at.
(3) Learning about nature.
(4) Improving my physical fitness.
(5) Visiting new places and experiencing new things.
(6) Tramping and camping.
(7) Being liked by teachers.
(8) Taking care of the natural environment.
(9) Doing my share of the work.
(10) Enjoying the outdoors.
(11) Being an important person to my classmates and teachers.
(12) Taking care of myself in almost any situation.
(13) Getting along with teachers.
(14) Taking part in outdoor recreation.
(15) Being liked by my classmates.
EXAMPLE OF ANSWER SHEET FOR METHODS TRIAL

Name: ..................................

Class: ..............................

Date: ..............................

No. ..........

<table>
<thead>
<tr>
<th>Important</th>
<th>Unimportant</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interesting</td>
<td>Dull</td>
<td></td>
</tr>
<tr>
<td>Simple</td>
<td>Difficult</td>
<td></td>
</tr>
<tr>
<td>Useless</td>
<td>Beneficial</td>
<td></td>
</tr>
<tr>
<td>Joyful</td>
<td>Gloomy</td>
<td></td>
</tr>
<tr>
<td>Safe</td>
<td>Risky</td>
<td></td>
</tr>
<tr>
<td>Tiring</td>
<td>Relaxing</td>
<td></td>
</tr>
</tbody>
</table>
### TABLE B.2.1 Results of methods trial (n=18). No control group was used.

<table>
<thead>
<tr>
<th>CONCEPT</th>
<th>% GAIN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Getting along with classmates</td>
<td>6</td>
</tr>
<tr>
<td>Learning what I am good and bad at</td>
<td>5</td>
</tr>
<tr>
<td>Learning about nature</td>
<td>1</td>
</tr>
<tr>
<td>Improving my physical fitness</td>
<td>0</td>
</tr>
<tr>
<td>Visiting new places and experiencing new things</td>
<td>0</td>
</tr>
<tr>
<td>Tramping and camping</td>
<td>5</td>
</tr>
<tr>
<td>Being liked by teachers</td>
<td>7</td>
</tr>
<tr>
<td>Taking care of the natural environment</td>
<td>3</td>
</tr>
<tr>
<td>Doing my share of the work</td>
<td>10^-1</td>
</tr>
<tr>
<td>Enjoying the outdoors</td>
<td>-4</td>
</tr>
<tr>
<td>Being an important person to my classmates and teachers</td>
<td>5</td>
</tr>
<tr>
<td>Taking care of myself in almost any situation</td>
<td>8</td>
</tr>
<tr>
<td>Getting along with teachers</td>
<td>1</td>
</tr>
<tr>
<td>Taking part in outdoor recreation</td>
<td>0</td>
</tr>
<tr>
<td>Being liked by classmates</td>
<td>4</td>
</tr>
</tbody>
</table>

1. "Doing my share of the work" increased through: interest, pleasure, relaxation and usefulness.
MODIFIED PIERS-HARRIS CHILDREN'S SELF CONCEPT SCALE. The last 15 items were deleted at Form IV level.

Here are a set of statements. Some of them are true of you and so you will circle the yes. Some are not true of you and so you will circle the no. Answer every question even if some are hard to decide, but do not circle both yes and no. Remember, circle the yes if the statement is generally like you, or circle the no if the statement is generally not like you. There are no right or wrong answers. Only you can tell us how you feel about yourself, so we hope you will mark the way you really feel inside.

1. My classmates make fun of me.
2. It is hard for me to make friends.
3. I am shy.
4. I get nervous when the teacher calls on me.
5. My looks bother me.
6. When I grow up, I will be an important person.
7. I am unpopular.
8. I am well behaved in school.
9. I cause trouble to my family.
10. I have good ideas.
11. I am an important member of my family.
12. I give up easily.
13. I am good in my school work.
14. I am an important member of my class.
15. I have pretty eyes.
16. I can give a good report in front of the class.
17. In school I am a dreamer.
18. I pick on my brother(s) and sister(s).
19. My friends like my ideas.
20. I often get into trouble.
21. My parents expect too much of me.
22. I like being the way I am.
23. I wish I were different.
24. I hate school.
25. I am among the last to be chosen for games.
26. My classmates in school think I have good ideas.
27. I have many friends.
28. I am cheerful.
29. I am dumb about most things.
30. I get into a lot of fights.
31. I am popular with boys.
32. My family is disappointed in me.
33. When I try to make something, everything seems to go wrong.
34. I am picked on at home.
35. In games and sports, I watch instead of play.
36. I am easy to get along with.
37. I lose my temper easily.
38. I am popular with girls.
39. I would rather work alone than with a group.
40. I can be trusted.
41. I am boyish.
42. I don't like things to change.
43. I stick up for my rights.
44. I think only of myself.
45. I am relaxed.
46. I think before I do anything.
47. I go along with the gang.
48. I am a happy person.
49. I want things right away.
50. I am sure of myself.
51. I like people as they are.
52. I can take it when people say bad things to me.
53. I trust people.
54. I hurt people.
55. I am afraid of things.
APPENDIX C.2

C.2 MILLWARD-GINTER OUTDOOR ATTITUDE INVENTORY USED FOR STANDARD IV AND FORM IV EXPERIMENTS

Do not write on these sheets
Answer all questions on the answer sheet

1. If you live in the city, you do not have to be worried about soil conservation.
2. Most wild animals are not dangerous if left alone.
3. No one should drop even one piece of paper outdoors.
4. Pollution is not really as bad as people say it is.
5. It would bother me to undress in front of other classmates in my cabin (tent) before going to bed.
6. We can get along without bees.
7. There are more interesting things to do than to learn about plants and animals in the outdoors.
8. I would enjoy living in the mountains.
9. My class alone cannot do much to improve the environment.
10. Working with other students in the outdoors is fun.
11. I get along well with teachers in the out-of-doors.
12. Learning in the outdoors is fun.
13. Time spent studying in the outdoors is a waste of time.
14. Protecting our native forests is not important as we have other things to use in place of wood.
15. Spiders are helpful to the environment.
16. It is hard for a group of classmates to agree with one another when deciding on activities.
17. I enjoy working with a group of students outdoors.
18. I enjoy being with teachers in the outdoors.
19. I think it is exciting to be alone in the bush if you are not lost.
20. Schools should spend more time teaching conservation.
21. Litter is not a problem where I live.
22. People cause more pollution than factories.
23. It is easy to make friends at camp during tea-time.
24. If I am not interested in the outdoors, I should not have to learn about it.

25. It is not easy to make new friends at camp.

26. Animals that live in the water are not as important as animals that live on the land.

27. Outdoors is not a place for school - but for playing.

28. Since hawks kill hedgehogs, it is wise for man to kill hawks.

29. When natural resources are used up on the earth we can get them from another planet.

30. I can improve my environment by writing to a member of parliament.

31. Nature interests me.

32. I like to study outdoor subjects.

33. I like small streams in the bush.

34. There is no harm in taking living plants home from the bush.

35. All kinds of plants are needed on earth.

36. Centipedes are helpful to man.

37. Plants that live in the water are not as important as plants that live on land.

38. Litter makes pollution.

39. People should be allowed to fish all year round.

40. I like books about nature.

41. Tramping is not much fun.

42. There is little that I can do to stop pollution.
APPENDIX C.3

PASSINEAU GENERAL ENVIRONMENTAL CONCERN SCALE USED FOR FORM VI EXPERIMENT

Do not write on these pages. Answer all questions on prepared answer sheet.

1. It is more important for our city to have
   a) clean air
   b) a good medical program

2. I would rather read a story about
   a) New Zealand soldiers in Viet Nam
   b) the first major oil spill

3. We should try harder to educate people to
   a) drive autos safely
   b) conserve electricity

4. If I could be a famous scientist I'd rather
   a) invent a cure for cancer
   b) invent a way to decrease air pollution

5. I would rather be the director of
   a) a space exploration program
   b) an environmental protection program

6. I would rather watch a T.V. program concerning
   a) the astronaut's flight to the moon
   b) the effects of industrial waste on water quality

7. I would rather join a demonstration to protest against
   a) war
   b) the use of pesticides

8. Which movie would you rather watch?
   a) The Drug World - the good and the bad
   b) DDT or Me - people worry about poisons

9. I would rather give $5 to
   a) the Prime Minister's Committee on Energy Conservation
   b) the Prime Minister's Committee on Crime Prevention

10. Parliamentarian Paul has been given two bills to vote on. Which bill do you think is more important?
    a) A bill which will provide more money to build houses for poor people.
    b) A bill giving scientists more money to develop new sources of energy.

11. What would you rather invent?
    a) a car that does not pollute
    b) a space ship that could travel to Mars

12. Who bothers you more?
    a) People that do not follow traffic safety laws
    b) People that pollute air

13. I would rather sign a petition to stop
    a) prejudice between people of different races
    b) air pollution
(14) I would rather donate $5 to help
   a) aid the victims of a cyclone disaster
   b) control pollution

(15) I would rather sign a petition complaining about
   a) the high cost of living (food, housing, etc.)
   b) the energy crisis

(16) I would rather watch a movie that describes
   a) a new wilderness area
   b) the tragic effects of crime

(17) If you were a member of parliament which of these two bills would you think more important?
   a) a bill to make water pollution laws more strict
   b) a bill to prevent the use of dangerous drugs

(18) I would rather work for
   a) the social services helping the poor
   b) the town water quality department

(19) What is more important to study at school?
   a) the dangers of pollution
   b) the dangers of war

(20) To me, the more important problem today is
   a) corruption of the government
   b) the relaxing of environmental quality laws

(21) To me the most important law that Parliament is now considering is a law to
   a) help develop better transportation systems for cities (monorails, buses, etc.)
   b) prevent corruption in politics

(22) I would rather talk to my friends about
   a) the dangers of drug abuse
   b) the problems of over-population

(23) I would rather visit a
   a) medical research centre
   b) sewage treatment plant

(24) I would rather sign a petition asking for a strong law to stop
   a) crime
   b) noise pollution

(25) I would rather write a school report on
   a) the effects of noise
   b) the effects of drugs

(26) I would rather give $5 to
   a) Citizens for Peace Organization
   b) People for a Quality Environment

(27) I would rather write a letter to my member of parliament requesting
   a) more help for the poor people
   b) the adoption of a law to prevent building developments from harming farm and marshland

(28) I would rather read a pamphlet about
   a) the Red Cross
   b) Zero Population Growth

(29) I would rather sign a petition urging the government
   a) to enforce stronger safety regulations for autos
   b) to enforce laws that will stop noise pollution
(30) I would rather help
   a) the poor people in a nearby city
   b) man a recycling center

(31) It is more important to me that
   a) we have a strong armed force to protect New Zealand
   b) we find ways to solve the problems of over population

(32) I would rather visit a
   a) wildlife refuge
   b) space centre

(33) I would rather give $5 to
   a) The New Zealand Cancer Society
   b) Environmental Defense Fund

(34) I would rather read a book about
   a) endangered wildlife
   b) drugs

(35) I would rather write to my city mayor and ask him
   a) to protect parks and farmland from building developments
   b) to support a good educational program for the city schools
APPENDIX C.4

C.4.1 PASSINEAU WILDERNESS ATTITUDE SCALE USED FOR FORM VI EXPERIMENT

Scale 2

Do not write on these pages.
Answer all questions on prepared answer sheet.

(1) What do you think the boy is saying?

A. We'll be able to see and do lots more this year with our new power boat.
B. I wish we wouldn't bring along all this stuff. We should camp way back in the bush so we can see more birds and animals.
Questions 2 to 21 have the following range of possible answers:

<table>
<thead>
<tr>
<th></th>
<th>A Strongly Agree</th>
<th>B Agree</th>
<th>C Undecided</th>
<th>D Disagree</th>
<th>E Strongly Disagree</th>
</tr>
</thead>
</table>

(2) There is already enough land set aside for wildlife and for parks. We don't need to set aside any more.

(3) It is important to prevent certain natural areas such as lakes, bush, and mountains from being used for mining, farming, and other uses.

(4) God gave us this earth to use - it's silly to set aside undeveloped areas and call them "wilderness".

(5) Empty land is wasted land.

(6) Some natural areas that are set aside to be used only for "wilderness recreation" (camping, tramping) have valuable fuels like coal and oil. These areas are important - we should keep them as they are and not allow them to be mined.

(7) It is no longer possible to set aside land for wilderness recreation. We must use that land for mining, timber, and for obtaining fuels for energy.

(8) We must save more natural areas now. If we don't, they'll be developed and spoiled forever.

(9) Natural areas set aside as wilderness are only for young people who like to tramp and camp.

(10) In an area set aside as "wilderness" people are not allowed to use vehicles like trail bikes. This is wrong - people should be able to use public land as they like.

(11) A wilderness area is for more than just tramping - it protects wildlife and water supplies.

(12) Certain natural areas should be set aside so that people can visit them and see the beauties of nature.

(13) We must have wilderness areas.

(14) Wilderness areas are nice to have, but we could do without them.

(15) There are already enough natural areas set aside - we don't need any more land locked up.

(16) Saving land as natural areas is just as important as saving land for farming.

(17) Motorized trail bikes should be prohibited in certain natural areas.

(18) If I could, I'd escape from civilization and live in the bush or mountains as the pioneers did.

(19) I'd like to hike or canoe in a natural area such as the bush, mountains, or lakes.

(20) We should learn to live more simply without all the modern conveniences we now have.

(21) We should learn to live the way the pioneers lived.
For questions 22 to 37 select ONE of the two possible answers

(22) I'd rather
a) camp in a campground next to the car
b) tramp in the bush away from the car and then camp.

(23) I'd rather
a) ride in a car and visit interesting places
b) tramp or canoe in some bush area where there are very few people

(24) I'd rather spend a week
a) at a camp such as the Scouts or YMCA
b) tramping with my family or a few friends in some natural area like native bush

(25) I'd rather ride in a
a) jet boat
b) sailboat

(26) I'd rather
a) go camping in the bush with a pack
b) go camping at a motorcamp with a caravan

(27) I'd rather
a) play ball
b) see a waterfall

(28) I'd rather visit
a) a big city like Auckland or Sydney
b) a National Park

(29) I'd rather watch a T.V. program about
a) African wildlife
b) race cars or movie stars

(30) I'd rather
a) swim in a pool
b) camp and tramp in the bush

(31) I'd rather
a) ride in a canoe
b) ride in a jetboat

(32) I'd rather
a) sleep in a bed
b) sleep outdoors

(33) I'd rather
a) ski at a ski field with tows and restaurants
b) ski on an undeveloped mountain slope

(34) I'd rather
a) tramp on a trail
b) motorbike on a trail

(35) I'd rather
a) play ball
b) go camping

(36) On a camp I would rather
a) listen to my radio and play cards or talk with my friends
b) sit quietly and listen to the sounds of the bush

(37) I'd rather visit a
a) wildlife refuge and watch birds
b) fairground and play games
C.4.2 SHORTENED PASSINEAU WILDERNESS ATTITUDE SCALE USED FOR FORM IV EXPERIMENTS

Scale 2

Do not write on these pages.
Answer all questions on prepared answer sheet.

(1) What do you think the boy is saying?

A. We'll be able to see and do lots more this year with our new power boat.

B. I wish we wouldn't bring along all this stuff. We should camp way back in the bush so we can see more birds and animals.
Questions 2 to 11 have the following range of possible answers:

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Undecided</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>

(2) There is already enough land set aside for wildlife and for parks. We don't need to set aside any more.

(3) It is important to prevent certain natural areas such as lakes, bush, and mountains from being used for mining, farming, and other uses.

(4) Some natural areas that are set aside to be used only for "wilderness recreation" (Camping, tramping) have valuable fuels like coal and oil. These areas are important - we should keep them as they are and not allow them to be mined.

(5) We must save more natural areas now. If we don't, they'll be developed and spoiled forever.

(6) Natural areas set aside as wilderness are only for young people who like to tramp and camp.

(7) In an area set aside as "wilderness" people are not allowed to use vehicles like trailbikes. This is wrong - people should be able to use public land as they like.

(8) We must have wilderness areas.

(9) Wilderness areas are nice to have, but we could do without them.

(10) I'd like to hike or canoe in a natural area such as the bush, mountains, or lakes.

(11) We should learn to live more simply without all the modern conveniences we now have.

For question 12 to 20 select ONE of the two possible answers

(12) I'd rather spend a week
   a) at a camp such as the Scouts or YMCA
   b) tramping with my family or a few friends in some natural area like native bush.

(13) I'd rather a) play ball b) see a waterfall.

(14) I'd rather watch a T.V. program about
   a) African wildlife b) race cars or movie stars

(15) I'd rather a) sleep in a bed b) sleep outdoors

(16) I'd rather
   a) ski at a ski field with tows and restaurants
   b) ski on an undeveloped mountain slope

(17) I'd rather a) tramp on a trail b) motorbike on a trail

(18) I'd rather a) play ball b) go camping

(19) On a camp I would rather
   a) listen to my radio and play cards or talk with my friends
   b) sit quietly and listen to the sounds of the bush

(20) I'd rather visit a
   a) wildlife refuge and watch birds
   b) fairground and play games.
# APPENDIX D.1

## D.1 PRE AND POST CAMP QUESTIONNAIRE AND RESULTS OF STANDARD IV

**Students on Camp One**

### Precamp

1. **Do you expect that camp will be fun?**

<table>
<thead>
<tr>
<th>Results</th>
<th>Number of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>No fun</td>
<td>0</td>
</tr>
<tr>
<td>A little fun</td>
<td>4</td>
</tr>
<tr>
<td>A great deal of fun</td>
<td>19</td>
</tr>
</tbody>
</table>

2. **How much do you expect to learn while on camp?**

<table>
<thead>
<tr>
<th>Number of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nothing</td>
</tr>
<tr>
<td>A little</td>
</tr>
<tr>
<td>A lot</td>
</tr>
</tbody>
</table>

3. **How fit do you think you are?**

<table>
<thead>
<tr>
<th>Number of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very fit</td>
</tr>
<tr>
<td>Somewhat fit</td>
</tr>
<tr>
<td>Not at all fit</td>
</tr>
</tbody>
</table>

### Postcamp

**Was camp fun?**

<table>
<thead>
<tr>
<th>Results</th>
<th>Number of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>No fun</td>
<td>1</td>
</tr>
<tr>
<td>A little fun</td>
<td>7</td>
</tr>
<tr>
<td>A great deal of fun</td>
<td>15</td>
</tr>
</tbody>
</table>

**How much did you learn while on camp?**

<table>
<thead>
<tr>
<th>Number of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nothing</td>
</tr>
<tr>
<td>A little</td>
</tr>
<tr>
<td>A lot</td>
</tr>
</tbody>
</table>

**How many new friends did you make?**

<table>
<thead>
<tr>
<th>Number of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
</tr>
<tr>
<td>A few</td>
</tr>
<tr>
<td>Many</td>
</tr>
</tbody>
</table>

**Was learning things at camp less fun or more fun than learning things at school?**

<table>
<thead>
<tr>
<th>Number of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less fun</td>
</tr>
<tr>
<td>The same</td>
</tr>
<tr>
<td>More fun</td>
</tr>
</tbody>
</table>
D.2 POSTCAMP QUESTIONNAIRE USED WITH STANDARD IV STUDENTS ON CAMP TWO

A. Of the following activities, which did you like the most? 
   Indicate your answer for each activity in the following way.

   ** - very good
   *  - good
   -  - O.K.
   -  - bad
   --- - very bad

1. Cabins - sleeping.
2. Dining hall - eating together.
3. Walking in exotic forests.
4. Meeting information officer.
5. Walking in native bush.
6. Getting to know teachers and parents better.
8. Learning things about yourself.
9. Being away from home (on your own).
10. Working with others (duties).
11. Being in a different place.
12. Learning about conservation.
13. Learning about nature.
15. Singsong and games together in the evening.

B. Write a brief statement on conservation.

C. Did you learn a lot, a little, nothing, on camp?

D. Do you think you learned more in 4 days at camp than if you had spent 4 days learning the same thing in school?

E. Would you like to go on another camp? If so, for how long?

F. Did you make any new friends? (a lot, a few or none).
APPENDIX D.3

D.3 QUESTIONNAIRE USED AT INTERVIEWS FOR FORM VI BIOLOGY STUDENTS ATTENDING CAMP.

Name

Camp:

Bio. Teacher

Date: February 1980

1. Now that you are back at school, what are your impressions, feelings about the bio trip? Good/Bad/Indifferent

2. What do you think you gained most from the trip?
   - What did you do on trip (which projects, activities) that supported this outcome?

3. What do you think was the purpose of the transect and quadrat studies?

4. Do you belong to any of the following clubs?

<table>
<thead>
<tr>
<th>Club</th>
<th>Now</th>
<th>Past</th>
</tr>
</thead>
<tbody>
<tr>
<td>Girl or Boy Scouts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biology Club</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tramping Club</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sports Team</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental Group</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5. Have you ever been camping in any kind of tent?
   Yes _____ No _____ Frequently _____

6. Had you ever visited a National Park? Yes ____ No ____ Frequently ____

7. Talked to an adult about a pollution problem that bothered you?
   Yes _____ No _____ Specifics _____

8. Have you ever told a friend not to drop rubbish on the ground?
   Yes _____ No _____

9. Would you like to go back to Arthur's Pass National Park on your own or with friends and family?
QUESTIONNAIRE

What would be your answer to the following questions on scale two?

1. A ___ or B ___ Why?
2. A ___ or B ___ Why?
13. A ___ or B ___ Why?
23. A ___ or B ___ Why?
27. A ___ or B ___ Why?
31. A ___ or B ___ Why?
35. A ___ or B ___ Why?

Comments:
### TABLE E.1.1

Item changes on the Self Concept Scale that showed a significant difference (p < 0.05) when the T-Test of significance was applied. The total maximum score is 1.0.

#### Experimental Group

<table>
<thead>
<tr>
<th>Item</th>
<th>Prescore</th>
<th>Postscore</th>
<th>Probability</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;My classmates make fun of me&quot;.</td>
<td>0.71</td>
<td>0.88</td>
<td>0.043</td>
<td>24</td>
</tr>
<tr>
<td>&quot;I am an important member of my class&quot;</td>
<td>0.12</td>
<td>0.37</td>
<td>0.031</td>
<td>208</td>
</tr>
<tr>
<td>&quot;I cause trouble to my family&quot;</td>
<td>0.75</td>
<td>0.96</td>
<td>0.022</td>
<td>28</td>
</tr>
<tr>
<td>&quot;I have pretty eyes&quot;</td>
<td>0.45</td>
<td>0.91</td>
<td>0.000</td>
<td>102</td>
</tr>
<tr>
<td>&quot;I give up easily&quot;</td>
<td>0.79</td>
<td>0.13</td>
<td>0.000</td>
<td>-84</td>
</tr>
</tbody>
</table>

#### Control Group

<table>
<thead>
<tr>
<th>Item</th>
<th>Prescore</th>
<th>Postscore</th>
<th>Probability</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;I am well behaved in school&quot;</td>
<td>0.60</td>
<td>0.36</td>
<td>0.031</td>
<td>-40%</td>
</tr>
<tr>
<td>&quot;My classmates in school think I have good ideas&quot;</td>
<td>0.40</td>
<td>0.68</td>
<td>0.016</td>
<td>70%</td>
</tr>
</tbody>
</table>
TABLE E.2.1  Items on the Self Concept Scale that showed consistent change in scores from the first pretest to the second pretest and from the second pretest to the posttest. A significance of difference was determined with the T-Test and is noted with asterisks.  (* = significance at the 0.05 probability level and ** = significance at the 0.01 probability level. Items not showing a consistent change of scores are not listed.  TOTAL MAXIMUM SCORE = 1.0.

<table>
<thead>
<tr>
<th>Item</th>
<th>Pretest One</th>
<th>Pretest Two</th>
<th>Significance</th>
<th>Posttest</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;I am relaxed&quot;</td>
<td>0.46</td>
<td>0.79</td>
<td>**</td>
<td>0.79</td>
<td>-</td>
</tr>
<tr>
<td>&quot;I want things right away&quot;</td>
<td>0.58</td>
<td>0.91</td>
<td>**</td>
<td>1.00</td>
<td>-</td>
</tr>
<tr>
<td>&quot;I lose my temper easily&quot;</td>
<td>0.29</td>
<td>0.50</td>
<td>-</td>
<td>0.63</td>
<td>-</td>
</tr>
<tr>
<td>&quot;I give up easily&quot;</td>
<td>0.75</td>
<td>0.00</td>
<td>** (-)</td>
<td>0.04</td>
<td>-</td>
</tr>
<tr>
<td>&quot;My looks bother me&quot;</td>
<td>0.54</td>
<td>0.71</td>
<td>-</td>
<td>0.75</td>
<td>-</td>
</tr>
<tr>
<td>&quot;I wish I were different&quot;</td>
<td>0.63</td>
<td>0.83</td>
<td>*</td>
<td>0.87</td>
<td>-</td>
</tr>
<tr>
<td>&quot;I am a happy person&quot;</td>
<td>0.70</td>
<td>0.75</td>
<td>-</td>
<td>0.92</td>
<td>*</td>
</tr>
<tr>
<td>&quot;In school I am a dreamer&quot;</td>
<td>0.50</td>
<td>0.75</td>
<td>**</td>
<td>0.75</td>
<td>-</td>
</tr>
<tr>
<td>&quot;I am among the last to be chosen for games&quot;</td>
<td>0.63</td>
<td>0.83</td>
<td>*</td>
<td>0.88</td>
<td>-</td>
</tr>
<tr>
<td>&quot;My classmates think I have good ideas&quot;</td>
<td>0.42</td>
<td>0.50</td>
<td>-</td>
<td>0.58</td>
<td>-</td>
</tr>
</tbody>
</table>
TABLE E.2.2  Items on the Outdoor Attitude Scale that showed consistent changes in score from the first pretest to the second pretest and from the second pretest to the posttest. A significance of difference is indicated with asterisks (as in Table E.2.1). Items not showing a consistent change of scores are not listed. TOTAL MAXIMUM SCORE = 3.0.

<table>
<thead>
<tr>
<th>Item</th>
<th>Pretest One</th>
<th>Pretest Two</th>
<th>Significance</th>
<th>Posttest</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Litter makes pollution&quot;</td>
<td>2.50</td>
<td>2.75</td>
<td>-</td>
<td>2.75</td>
<td>-</td>
</tr>
<tr>
<td>&quot;There is little that I can do to stop pollution&quot;</td>
<td>2.38</td>
<td>2.04</td>
<td>-</td>
<td>1.58</td>
<td>-</td>
</tr>
<tr>
<td>&quot;I can improve my environment by writing to a member of parliament&quot;</td>
<td>1.87</td>
<td>1.62</td>
<td>-</td>
<td>1.50</td>
<td>-</td>
</tr>
<tr>
<td>&quot;It would bother me to undress in front of other classmates in my cabin (tent) before going to bed&quot;</td>
<td>2.46</td>
<td>2.54</td>
<td>-</td>
<td>2.62</td>
<td>-</td>
</tr>
<tr>
<td>&quot;I get along well with teachers in the outdoors&quot;</td>
<td>2.45</td>
<td>2.75</td>
<td>*</td>
<td>2.75</td>
<td>-</td>
</tr>
<tr>
<td>&quot;I enjoy being with teachers in the outdoors&quot;</td>
<td>2.50</td>
<td>2.75</td>
<td>*</td>
<td>2.75</td>
<td>-</td>
</tr>
<tr>
<td>&quot;There are more interesting things to do than learn about plants and animals in the outdoors&quot;</td>
<td>2.33</td>
<td>2.50</td>
<td>-</td>
<td>2.58</td>
<td>-</td>
</tr>
<tr>
<td>&quot;I like to study outdoor subjects&quot;</td>
<td>2.62</td>
<td>2.75</td>
<td>-</td>
<td>2.86</td>
<td>-</td>
</tr>
<tr>
<td>&quot;I like books about nature&quot;</td>
<td>2.37</td>
<td>2.25</td>
<td>-</td>
<td>2.75</td>
<td>**</td>
</tr>
<tr>
<td>&quot;We can get along without bees&quot;</td>
<td>2.33</td>
<td>2.42</td>
<td>-</td>
<td>2.62</td>
<td>-</td>
</tr>
<tr>
<td>Item</td>
<td>Pretest One</td>
<td>Pretest Two</td>
<td>Significance</td>
<td>Posttest</td>
<td>Significance</td>
</tr>
<tr>
<td>-----------------------------------------------------</td>
<td>-------------</td>
<td>-------------</td>
<td>--------------</td>
<td>----------</td>
<td>--------------</td>
</tr>
<tr>
<td>&quot;Nature interests me&quot;</td>
<td>2.70</td>
<td>2.87</td>
<td>-</td>
<td>2.87</td>
<td>-</td>
</tr>
<tr>
<td>&quot;I like small streams in the bush&quot;</td>
<td>2.79</td>
<td>2.96</td>
<td>-</td>
<td>3.00</td>
<td>-</td>
</tr>
<tr>
<td>&quot;All kinds of plants are needed on earth&quot;</td>
<td>2.66</td>
<td>2.79</td>
<td>-</td>
<td>2.83</td>
<td>-</td>
</tr>
<tr>
<td>&quot;Plants that live in water are not as important as plants that live on land&quot;</td>
<td>2.45</td>
<td>2.58</td>
<td>-</td>
<td>2.67</td>
<td>-</td>
</tr>
<tr>
<td>&quot;People should be allowed to fish all year round&quot;</td>
<td>2.08</td>
<td>2.58</td>
<td>*</td>
<td>2.54</td>
<td>-</td>
</tr>
<tr>
<td>&quot;Tramping is not much fun&quot;</td>
<td>2.54</td>
<td>2.83</td>
<td>-</td>
<td>2.83</td>
<td>-</td>
</tr>
</tbody>
</table>
## E.3 RESULTS OF FORM IV STUDENTS ATTENDING CAMP ONE

### TABLE E.3.1 Item changes on self concept that showed a significant difference ($p < 0.05$) when the T-Test of significance was applied. (Items that did not change are not listed). TOTAL MAXIMUM SCORE = 5.0.

<table>
<thead>
<tr>
<th>Item</th>
<th>Experimental Group (n=30)</th>
<th>Control Group (n=45)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Prescore</td>
<td>Postscore</td>
</tr>
<tr>
<td>&quot;My classmates make fun of me&quot;</td>
<td>0.83</td>
<td>0.67</td>
</tr>
<tr>
<td>&quot;I am an important member of the family&quot;</td>
<td>0.60</td>
<td>0.83</td>
</tr>
<tr>
<td>&quot;I pick on my brother(s) and sister(s)&quot;</td>
<td>0.47</td>
<td>0.60</td>
</tr>
<tr>
<td>&quot;I am popular with boys&quot;</td>
<td>0.33</td>
<td>0.60</td>
</tr>
<tr>
<td>&quot;My family is disappointed in me&quot;</td>
<td>0.90</td>
<td>0.73</td>
</tr>
<tr>
<td>&quot;It is hard for me to make friends&quot;</td>
<td>0.76</td>
<td>0.84</td>
</tr>
<tr>
<td>&quot;I am an important member of the class&quot;</td>
<td>0.38</td>
<td>0.53</td>
</tr>
<tr>
<td>&quot;I can give a good report in front of class&quot;</td>
<td>0.33</td>
<td>0.56</td>
</tr>
<tr>
<td>&quot;I am dumb about most things&quot;</td>
<td>0.98</td>
<td>0.89</td>
</tr>
</tbody>
</table>

1. For this scale, the control group consists of the combined lower and upper ability classes.
TABLE E.3.2 Item changes on the Outdoor Attitude scale that showed a significant difference (p < 0.05) when the T-test of significance was applied. (Items that did not change are not listed). TOTAL MAXIMUM SCORE = 5.0

<table>
<thead>
<tr>
<th>Item</th>
<th>Prescore</th>
<th>Postscore</th>
<th>Probability</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;There are more interesting things to do than learn about plants and animals in the outdoors&quot;</td>
<td>2.33</td>
<td>2.96</td>
<td>0.028</td>
<td>27.</td>
</tr>
<tr>
<td>&quot;Learning in the outdoors is fun&quot;</td>
<td>4.47</td>
<td>4.03</td>
<td>0.040</td>
<td>-10.</td>
</tr>
<tr>
<td>&quot;I like books about nature&quot;</td>
<td>2.23</td>
<td>2.67</td>
<td>0.007</td>
<td>20.</td>
</tr>
<tr>
<td>&quot;Spiders are helpful to the environment&quot;</td>
<td>3.03</td>
<td>3.50</td>
<td>0.032</td>
<td>16.</td>
</tr>
<tr>
<td>&quot;I like small streams in the bush&quot;</td>
<td>4.00</td>
<td>3.63</td>
<td>0.019</td>
<td>-9.</td>
</tr>
<tr>
<td>&quot;All kinds of plants are needed on earth&quot;</td>
<td>4.20</td>
<td>3.60</td>
<td>0.001</td>
<td>-14.</td>
</tr>
<tr>
<td>&quot;I think it is exciting to be alone in the bush if you are not lost&quot;</td>
<td>3.80</td>
<td>3.26</td>
<td>0.016</td>
<td>-12.</td>
</tr>
</tbody>
</table>
TABLE E.3.3  Item changes on the Outdoor Attitude Scale for the lower and upper ability **CONTROL** group, that showed a significant difference (p < 0.05) when the T-Test of significance was applied. (Items that did not change are not listed). **TOTAL MAXIMUM SCORE = 5.0.**

<table>
<thead>
<tr>
<th>Item</th>
<th>Prescore</th>
<th>Postscore</th>
<th>Probability</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;My class alone cannot do much to improve the environment&quot;</td>
<td>2.61</td>
<td>3.06</td>
<td>0.042</td>
<td>17</td>
</tr>
<tr>
<td>&quot;Litter is not a problem where I live&quot;</td>
<td>3.00</td>
<td>3.56</td>
<td>0.046</td>
<td>16</td>
</tr>
<tr>
<td>(&quot;I can improve my environment by writing to a member of parliament&quot;)</td>
<td>2.17</td>
<td>2.61</td>
<td>0.057¹</td>
<td>20</td>
</tr>
<tr>
<td>&quot;If you live in the city, you do not have to be worried about soil conservation&quot;</td>
<td>3.11</td>
<td>3.72</td>
<td>0.017</td>
<td>20</td>
</tr>
<tr>
<td>&quot;I like small streams in the bush&quot;</td>
<td>3.83</td>
<td>4.22</td>
<td>0.015</td>
<td>10</td>
</tr>
<tr>
<td>&quot;There is no harm in taking living plants home from the bush&quot;</td>
<td>3.27</td>
<td>3.94</td>
<td>0.004</td>
<td>20</td>
</tr>
<tr>
<td>(&quot;Nature interests me&quot;)</td>
<td>3.61</td>
<td>4.06</td>
<td>0.057²</td>
<td>12</td>
</tr>
<tr>
<td>&quot;Schools should spend more time teaching conservation&quot;</td>
<td>3.28</td>
<td>3.06</td>
<td>0.042</td>
<td>17</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item</th>
<th>Prescore</th>
<th>Postscore</th>
<th>Probability</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;My class alone cannot do much to improve the environment&quot;</td>
<td>2.59</td>
<td>3.00</td>
<td>0.039</td>
<td>16</td>
</tr>
<tr>
<td>&quot;Protecting our native forests is not important as we have other things to use in place of wood&quot;</td>
<td>4.59</td>
<td>4.29</td>
<td>0.043</td>
<td>-7</td>
</tr>
</tbody>
</table>
APPENDIX E.4

E.4 RESULTS OF FORM IV STUDENTS ATTENDING CAMP TWO

**TABLE E.4.1** Item changes on the Outdoor Attitude scale that showed a significant difference (p < 0.05) where the T-Test of significance was applied. (Items that did not change are not listed).

TOTAL MAXIMUM SCORE = 5.0.

<table>
<thead>
<tr>
<th>Item</th>
<th>LOWER ABILITY EXPERIMENTAL GROUP (n=18)</th>
<th>UPPPER ABILITY EXPERIMENTAL GROUP (n=24)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Prescore</td>
<td>Postscore</td>
</tr>
<tr>
<td>&quot;It would bother me to undress in front of other classmates in my cabin (tent) before going to bed&quot;</td>
<td>3.10</td>
<td>3.30</td>
</tr>
<tr>
<td>&quot;Protecting our native forests is not important as we have other things to use in place of wood&quot;</td>
<td>3.10</td>
<td>4.10</td>
</tr>
<tr>
<td>&quot;There is no harm in taking living plants home from the bush&quot;</td>
<td>3.20</td>
<td>4.10</td>
</tr>
<tr>
<td>&quot;I can improve my environment by writing to a member of parliament&quot;</td>
<td>3.28</td>
<td>2.72</td>
</tr>
</tbody>
</table>
TABLE E.4.1 (Contd)

<table>
<thead>
<tr>
<th>Item</th>
<th>Prescore</th>
<th>Postscore</th>
<th>Probability</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Outdoors is not a place for school - but for playing&quot;</td>
<td>3.45</td>
<td>3.83</td>
<td>.026</td>
<td>11.</td>
</tr>
<tr>
<td>&quot;I like books about nature&quot;</td>
<td>3.16</td>
<td>3.50</td>
<td>.043</td>
<td>11.</td>
</tr>
</tbody>
</table>
APPENDIX F

SOURCES CONSULTED

- Dissertation Abstracts;
- Research in Education;
- Educator's Guide to Periodic Literature;
- Journal of Environmental Education;
- Journal of Physical Education, Health Education and Recreation (JOPHER);
- Unpublished Master's Theses;
- New Zealand Education Department and Education Board;
- University of Canterbury Education Department Test Library;
- Canterbury Museum - education division;
- other relevant periodic literature and texts;
- Christchurch Teacher's College staff and students involved in outdoor education;
- Christchurch teachers; and,
- University of Canterbury Education Department staff.