THE EFFECT OF METAPHORIC, EXPERIENTIAL EDUCATION ON CREATIVITY AND SENSATION SEEKING IN ADVENTURE-BASED EDUCATION

A Thesis

Presented in Partial Fulfillment of the Requirements for the Degree Master of Science In the Graduate School of the Ohio State University

by

Suzanne Hanes, B.A.

* * * * *
The Ohio State University
1989

Master's Examination Committee:

Gary W. Mullins, Ph.D, Chair
John F. Disinger, Ph.D
Robert R. Bargar, Ph.D

Approved by:

Gary W. Mullins
Adviser
School of Natural Resources
To the memory of my parents, 
Marjorie E. and Rolland L. Tolliver, 
and my friend Dr. Ross L. Mooney.

Be a dreamer, 
but dream of today.

For life is made of dreams 
and within them 
we can learn 
to touch 
to see 
to love

with all the innocence 
and wonder of a child.
ACKNOWLEDGEMENTS

For a person to unfold, there needs to be an event or another person who touches the life of the one who is to grow. The process of unfolding is sometimes painful. Where there is risk, and change there is the possibility of growth. Just as the flowers cannot grow without rain and sun, without winter and spring, an individual cannot strive toward the concept of self identity without struggle and obstacles, kindness and caring. Where there is challenge and change there is the possibility of growth. As pilgrims on the journey through life, some are fortunate enough to encounter other pilgrims who are willing to help in the unfolding process. Each person touching, helping in their own way with their special abilities.

Dr. Gary Mullins: advisor, teacher, and friend.
Dr. John Disinger: contributed editorial guidance.
Dr. Robert Bargar: contributed support and time for thought provoking discussions to further formulate ideas.
Dr. Alan Ewert: served as reader, provided the foundation for this research, and taught many valuable lessons through metaphoric, experiential educational methods.
Drs. James Christensen and Donald Eckert: provided statistical guidance.
Friends: Kay Gust, Heath Hatfield, Pat Paterson, Linda Romine, and my family who, with their kindness and caring, touched in so many ways.
VITA

January 3, 1947 . . . . . . . . . . Born - Columbus, Ohio

1984 . . . . . . . . . . . . . . . . . B.A. Magna Cum Laude
Capital University, Columbus, Ohio

1988 . . . . . . . . . . . . . . . . . Graduate Associate,
Ohio State University, School of Natural
Resources

FIELDS OF STUDY

Major Field: Natural Resources
Minor Fields: Psychology, Art Therapy, and Education
# TABLE OF CONTENTS

DEDICATION ........................................ ii
ACKNOWLEDGEMENTS ................................... iii
VITA ................................................ iv
LIST OF TABLES ....................................... vii
LIST OF FIGURES .................................... viii

<table>
<thead>
<tr>
<th>CHAPTER</th>
<th>INTRODUCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Statement of the Problem .................................. 9</td>
</tr>
<tr>
<td></td>
<td>Purpose .................................................... 10</td>
</tr>
<tr>
<td></td>
<td>Significance of the Study .................................. 11</td>
</tr>
<tr>
<td></td>
<td>Definition of Terms ....................................... 12</td>
</tr>
<tr>
<td></td>
<td>Limitations ............................................... 16</td>
</tr>
<tr>
<td></td>
<td>Assumptions ............................................... 16</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>II</th>
<th>REVIEW OF RELATED LITERATURE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Theoretical Model of Creativity ........................................... 21</td>
</tr>
<tr>
<td></td>
<td>Definition .................................................... 27</td>
</tr>
<tr>
<td></td>
<td>Traits ......................................................... 32</td>
</tr>
<tr>
<td></td>
<td>Conceptual Framework .............. 38</td>
</tr>
<tr>
<td></td>
<td>Flow .......................................................... 41</td>
</tr>
<tr>
<td></td>
<td>Environment ................................................. 46</td>
</tr>
<tr>
<td></td>
<td>Socialization ............................................... 51</td>
</tr>
<tr>
<td></td>
<td>Ostracism .................................................... 55</td>
</tr>
<tr>
<td></td>
<td>Risk and Change ............................................. 58</td>
</tr>
<tr>
<td></td>
<td>Sensation Seeking ................................. 66</td>
</tr>
<tr>
<td></td>
<td>Intrinsic Motivation .................. 68</td>
</tr>
<tr>
<td></td>
<td>Hemisphericity .............................................. 69</td>
</tr>
<tr>
<td></td>
<td>Senses ......................................................... 77</td>
</tr>
<tr>
<td></td>
<td>Blocks and Inhibitors .................. 81</td>
</tr>
<tr>
<td></td>
<td>Play and Fantasy ......................... 85</td>
</tr>
<tr>
<td></td>
<td>Metaphor ..................................................... 90</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>III</th>
<th>PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Research Design ........................................... 95</td>
</tr>
<tr>
<td></td>
<td>Subject Selection .......................................... 97</td>
</tr>
<tr>
<td></td>
<td>Instrumentation ........................................... 98</td>
</tr>
</tbody>
</table>
TABLE OF CONTENTS (cont.)

<table>
<thead>
<tr>
<th>CHAPTER</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions of Testing</td>
<td>99</td>
</tr>
<tr>
<td>Control Group</td>
<td>100</td>
</tr>
<tr>
<td>Treatments</td>
<td>101</td>
</tr>
<tr>
<td>Data Analysis</td>
<td>104</td>
</tr>
</tbody>
</table>

IV RESULTS

Hypotheses                                      | 106  |
Sample Size                                    | 108  |
Statistical Analysis of Data                   | 108  |

V DISCUSSION AND RECOMMENDATIONS

Discussion                                      | 122  |
Recommendations                                | 138  |

REFERENCES                                     | 143  |

APPENDICES

APPENDIX A. How Do You Think Form E           | 153  |
APPENDIX B. Sensation Seeking Scale V          | 158  |
APPENDIX C. First Correspondence to Participants | 163  |
APPENDIX D. Second Correspondence to Participants | 165  |
APPENDIX E. Descriptive Data of Non-Participants in Adventure Programs | 167  |
APPENDIX F. Descriptive Data of Participants in Adventure Programs | 171  |
# List of Tables

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Descriptive Statistics and t-test of <em>How Do You Think</em> Form E</td>
<td>109</td>
</tr>
<tr>
<td>2.</td>
<td>Results of MANOVA—Control Groups’ Pre Test Scores—Compared to Pre Test Scores of Treatment Group</td>
<td>111</td>
</tr>
<tr>
<td>3.</td>
<td>Results of MANOVA Between Treatment Groups’ Post Test Scores Compared to Post Only Scores</td>
<td>112</td>
</tr>
<tr>
<td>4.</td>
<td>Results of Manova Between Control Groups’ Pre-Post Scores Compared to Post Only Scores</td>
<td>113</td>
</tr>
<tr>
<td>5.</td>
<td>Results of MANOVA of Control Groups’ Post Test Scores Compared to Post Test Scores of the Treatment Group</td>
<td>114</td>
</tr>
<tr>
<td>6.</td>
<td>Differences in Post Sensation Seeking Scores Between Control and Treatment Groups</td>
<td>116</td>
</tr>
<tr>
<td>7.</td>
<td>Relation of Sensation Seeking Pared Comparison Scores Between Control and Treatment Groups</td>
<td>116</td>
</tr>
<tr>
<td>8.</td>
<td>The Correlation Between Sensation Seeking and Creativity</td>
<td>117</td>
</tr>
<tr>
<td>9.</td>
<td>The Correlation Between Thrill and Adventure and Creativity</td>
<td>118</td>
</tr>
<tr>
<td>10.</td>
<td>The Correlation Between Experience Seeking and Creativity</td>
<td>119</td>
</tr>
<tr>
<td>11.</td>
<td>The Correlation Between Boredom Susceptibility and Creativity</td>
<td>120</td>
</tr>
<tr>
<td>12.</td>
<td>The Correlation Between Disinhibition and Creativity</td>
<td>121</td>
</tr>
<tr>
<td>13.</td>
<td>Descriptive Data of the Non-Participants</td>
<td>167</td>
</tr>
<tr>
<td>14.</td>
<td>Descriptive Data of Participants in Adventure Programs</td>
<td>171</td>
</tr>
<tr>
<td>FIGURES</td>
<td>PAGE</td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td>------</td>
<td></td>
</tr>
<tr>
<td>1. Representation of the Hemispheric Functions of the Brain</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>2. Theoretical Model of Creativity and Sensation Seeking</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>3. Comparison of the Socialization of the Child and the Adult</td>
<td>38</td>
<td></td>
</tr>
<tr>
<td>4. Representation of Solomon Four-Group Design</td>
<td>96</td>
<td></td>
</tr>
<tr>
<td>5. The Correlation Between Sensation Seeking and Creativity</td>
<td>117</td>
<td></td>
</tr>
<tr>
<td>6. The Correlation Between Thrill and Adventure Seeking and Creativity</td>
<td>118</td>
<td></td>
</tr>
<tr>
<td>7. The Correlation Between Experience Seeking and Creativity</td>
<td>119</td>
<td></td>
</tr>
<tr>
<td>8. The Correlation Between Boredom Susceptibility and Creativity</td>
<td>120</td>
<td></td>
</tr>
<tr>
<td>9. The Correlation Between Disinhibition and Creativity</td>
<td>121</td>
<td></td>
</tr>
</tbody>
</table>
CHAPTER I

INTRODUCTION AND NEED FOR STUDY

A challenge awaits us. The challenge is to establish modes of education that emphasize metaphoric learning, experiential education, and challenge as acceptable alternatives to more traditional applications of the educational system (Sanders & Sanders, 1984).

These modes of education relate primarily to the affective process (right hemispheric function). While this is not to minimize the left hemispheric functioning, associated with cognitive processes, it appears that utilization of holistic processing emerges within creative endeavors (Sanders & Sanders, 1984).

Adventure education presents information within a metaphoric experiential mode (Bacon, 1983). A combination of affective process and cognitive process is present in such educational experiences. Acquisition of skills and information promote growth in self. Andrews (1980:81) identifies the processes as seen even in "mundane achievements" such as learning to ride a bike. With respect to such experiences "in which the accumulation of knowledge and the mastery of skills seems to be of primary importance,
one must consider the integrative relationship of informational content and motivative intrinsic forces in order to promote understanding and mastery of the activity as self-growth" (Andrews, 1980:81).

Our Western culture is primarily concerned with cognitive processes; therefore affective development is suppressed (Andrews, 1980; Samples, 1976; Samules & Samules, 1975). But children use an integrated approach to learning — they visualize, create, investigate, discover, dream and respond to sensory stimuli (Bailey, 1920). As the child grows, he/she is expected to put away "childish" play and concentrate on what are considered more "adult" activities. This transition includes a more analytical, rational thought process that in many instances culminates into nothing more than rote memory.

Metaphoric, experiential methods of education are not new. Liberty Hyde Bailey's *The Nature Study Idea* (1920) presented a holistic approach to teaching. Bailey advocated use of the senses (in discovery as an expression of learning), art, poetry, collecting, and the child's involvement in the natural world. Equally important, Bailey believed that a child should be presented and allowed to respond to the world on his/her own level. Others within the progressive educational movement also realized the importance of experiential education, the arts, self-
expression, and presented a holistic view of both the child and pedagogy (Cremin, 1961).

Ours is a technical society which requires an individual to acquire and reproduce vast amounts of knowledge. The mastery of such knowledge requires convergent and divergent thinking (Torrance & Mourad, 1979). An emerging perspective in today's business and social environment concerns the traits an organization considers important and necessary for maximum utilization of the attributes its members possess. This trend indicates a need to establish programs that enhance those traits associated with creativity, especially as business and society in general seek a more diverse, creative innovative individual (Reitz, 1987; Ivancevich & Matteson, 1987; Peters & Waterman, Jr., 1982). As a means to this end, consideration is being given to experiential, metaphoric education (Bacon, 1983; Sanders & Sanders 1984). Organizations are concerned with technological innovation, and universities are defining a successful individual of the 21st century as "flexible, creative, adaptable and comfortable with things new and different" (Jennings, 1987).

Creativity, or creative behavior, may be viewed as a method of problem solving applicable to all disciplines. Thus, need exists for a better understanding of creativity, the creative process, and the creative person. Rothenberg and Hausman (1976:3-5) elaborate: "Yet there is a need for
rational understanding of creativity that supersedes these doubts, irritations, and criticisms: creativity has direct pertinence to diverse types of disciplines and to the enhancement of humanistic goals in our technological and atomic age." The authors continue: "Many other types of professionals, including educators, educational psychologists, business executives, and government personnel concerned with manpower, are interested in an immediate and pressing way, primarily in order to identify and nurture creative talent."

Across all lines of society, the interest and necessity of fostering creativity is being recognized. The validity of creativity, or living a creative life (Davis, 1986) has been acknowledged in the past, but viewed as mysterious. Adams (1986) and Reitz (1987) attribute most of the association with mystery to the fact that creativity is a process that is largely mental and difficult to observe. "The nature of creativity is so hard to get at that it has been popularly attributed to mysterious agents, such as muses or demons" (Reitz, 1987:181).

Creative individuals and creativity must be viewed as an intricate part of a healthy society.
Rogers (cf Holsinger, Jordan & Levenson, 1971; 3) addresses the implications of a society that does not foster creativity:

With scientific discovery and invention proceeding, we are told, at a geometric rate of progression, a generally passive and culturebound people cannot cope with the multiplying issues and problems. Unless individuals, groups, and nations can imagine, construct, and creatively revise new ways of relating to these complex changes, the lights will go out. Unless man can make new and original adaptations to his environment as his science can change the environment, our culture will perish. Not only individual maladjustment and group tensions but international annihilation will be the price we pay for a lack of creativity.

A quest for wholeness (a totality of function involving both hemispheres of the brain) is an undercurrent existing within our culture (Staley, 1979). Acceptance, or at least tolerance, of divergent thinkers may be considered. Samules and Samules (1975:13) state: "The price of civilization for man has been the loss of his sense of wholeness and a search for the missing pieces." This wholeness is reflected in an integrated approach to problem solving. Research indicates more effective information processing in adults having an information processing style associated with an integrated (right and left hemisphere) or right hemispheric approach (Torrance & Mourad, 1979). "With the knowledge now available about the separate abilities and importance of both hemispheres (of the brain) it is imperative that future
programs and research stop discrimination against the right hemisphere and expand to include the full range of mental abilities" (Staley, 1979:30). Adventure-based education uses both metaphorical and experiential modes of learning. Such programs utilize a whole-brain approach, integrating both hemispheres, a process necessary to foster creativity (Torrance & Mourad, 1971; Michaelis, 1980; Maslow, 1962).

While the necessity of fostering creativity has been substantiated in the literature of education and psychology, the majority of educational systems appear to be stifling creativity rather than fostering it. Stifling of creativity may be caused by a socialization process in which the child's identity is challenged, necessitating a move from intrinsic to extrinsic rewards (Boulding, 1983; May, 1983; Moustakas, 1969; Michaelis, 1980; Tolliver, 1985). According to May (1983), knowledge upsets the homeostasis of human beings. It in effect upsets the balance between an individual and the group. Education is designed for the group and not for the individual (Moustakas, 1969).

The freshness and spontaneity of child's play and fantasy are viewed as deterrents in the socialization process. Rebellion and/or alienation is the recourse the child takes in order to survive within the system. "When the child is treated as an object of learning, as
an incomplete thing, as an empty vessel to be filled with facts and explanation, his only chance if he is to survive as a person is to rebel" (Moustakas, 1969:6). Conflict begins and alienation is seen as a sign of adjustment; eventually the individual conforms. Alienation also occurs within organizations when the individual does not conform to the standards expected.

The environment established is not conducive to innovation or creativity. Such an environment must be safe and accepting of the individual, encouraging risk and openness to the environment, and have a positive regard for change and novelty (Parnes, 1967; Rogers, 1971; Adams, 1986; Reitz, 1987).

Samples (1976:31) notes:

...occasionally cultures experience anxiety. Most often their collective anxieties emerge when some kind of inexplicable change is taking place. In the face of things not easily explained, cultures do become, quite metaphorically, nervous. It’s no coincidence that when the nervousness of culture is felt in educational circles, arguments reflectively emerge about reading, writing, and arithmetic. 'Back to basics' is the somewhat nostalgic response of people who begin to see the minds of children wander into metaphor. Wandering into metaphor makes people nervous.

In metaphor, the message is absorbed experientially, affectively and unconsciously. The contribution from the conscious intellect is minimal or secondary. A metaphor, to be effective, must be isomorphic—that is, its major elements must be
represented by corresponding elements in experience. A transderivational search begins when a metaphor is used in a learning experience. This is a cognitive process by which an individual's communication is decoded (Bacon, 1983). Transderivational search is similar to Novak's (1983) concept of an individual's capacity to perceive regularities in events or objects and the ability to code the regularities symbolically.

Adventure-based programs use experiential, metaphoric education with an emphasis on affective learning experiences, and have as their focus an individual's social and emotional growth. Experiential learning involves "whole-brain" activities, while metaphoric education is primarily a function of the right hemisphere. Figure I illustrates the functions associated with the right and left hemispheres of the brain.

Figure I

Representation of the Hemispheric Functions of the Brain

Samules & Samules, 1975:62
As is noted by Samules & Samules (1975:62): "The cerebrum of the brain is divided into two hemispheres, each of which has specialized functions. The left hemisphere is concerned with verbal analytic information, while the right hemisphere is basically concerned with visual/intuitive information."

In adventure-based education, concepts are presented within the experiential mode. Individuals are integrating the use of their senses while acquiring skills and concepts in a natural environment, using stress, group support and encouragement of self-examination. Problem solving is the basic teaching style (Meier, Morash, Welton, 1980) presented within the experiential, metaphoric mode.

Statement of Problem

Traits of individuals involved in or desiring to take part in adventure programs reflect many of the traits of creative individuals (Davis, 1983; Csikszentmihalyi, 1975). The creative process has been viewed as elusive by researchers, because the necessity to interrupt the process to gather data effectively stops the process. Researchers (Davis, Peterson & Farley, 1974) have noted that sensation seeking and creativity are linked. Zuckerman (1979) has also demonstrated that sensation seeking and risk taking are
linked empirically. If sensation seeking and risk are associated and risk and creativity are linked, then a relationship among creativity, sensation seeking and risk could reasonably be assumed.

This link is hypothesized in the literature. One of the major traits of creative individuals listed is risk taking behavior (Arnold, 1962; Davis, 1983; Adams, 1986; Rothenberg, 1976; Lord, Hutchison & VanDebeck, 1980; Moore & Gergen, 1985; Sisson, 1985; Reitz, 1987).

The problem statement guiding this study was: Do individuals involved in adventure programs exhibit a higher predisposition to behave creatively than those choosing not to participate in such programs, and do participants in adventure programs show an increase in sensation seeking after participation in an adventure experience?

Purpose

This study is a mixed purpose study with two dimensions. The first was to provide further evidence of the relationship among sensation seeking, risk taking and creativity, as well as to answer the question: Do college students who take part in adventure education programs have a greater propensity toward creativity than college students who choose not to take part in adventure programs?
The second dimension seeks to answer the questions: Do individuals involved in adventure experiences reflect traits of risk taking and/or sensation seeking, and, Does propensity for sensation seeking increase after adventure experiences?

Creative individuals exhibit traits of risk taking, self-confidence, spontaneity, adventure, playfulness, intrinsic motivation and independence (Davis, 1986). These traits are also found in individuals involved in or desiring to take part in adventure experiences. Risk appears to be a link between creativity and adventure experiences. If creative individuals are risk-takers, and risk-takers are high in sensation seeking, then sensation seeking and risk-taking should be correlated to creativity. By placing an individual in an environment where risk taking behavior is encouraged, the future propensity for risk taking, sensation seeking, and creativity should be enhanced.

Significance of the Study

This study assesses relationships among sensation seeking, risk-taking, and creativity. Links between sensation seeking, risk taking and creativity will aid in future studies with the possibility of investigations into the creative process and adventure
based education. If similarities exist, then adventure education could be used to foster creativity. Within the flow phenomenon or peak experience, commonalities as described may be found that parallel the affective processes associated with creative behavior, establishing ground-work for further research into the creative process.

Research Questions

1. Do individuals involved in adventure experiences reflect traits of risk taking, sensation seeking and creativity, and, Do college students who take part in adventure education programs have a greater propensity toward creativity than college students who choose not to take part in adventure programs?

2. Does propensity for sensation seeking increase after adventure experiences?

Definition of Terms

Adventure Experiences: An adventure experience has an element of uncertainty and the outcome is unknown or the setting is unfamiliar (Priest and Baillie, 1987). Activities are based on the interrelatedness of humans with the natural environment, particularly where that environment may present discomfort, danger, and unique situations. Such activities contain elements of risk
(real or perceived) and are physically and emotionally challenging. The individual is no longer the master of the situation and fears both physical and emotional failure.

Boredom Susceptibility (BS): "an aversion for repetitive experience of any kind, routine work, or dull and boring people and extreme restlessness under conditions when escape from constancy is impossible" (Zuckerman, 1976:103).

Creativity: Creativity has been defined by numerous authors. The definition of creativity is dependent upon the context of application. For example, Freedman (1976) and Ackoff (1981) each found several hundred definitions of creativity (cf. Rickards, 1985). An individual's life style, which according to Davis (1983:2) includes "exploring new places and new ideas." Davis continues, "Being creative is developing a sensitivity to problems of others and of mankind. And being creative is using your imagination to invent lots of new ideas to solve problems". For these purposes creativity was defined as a life-style composed of traits that enable the individual to create novel applicable ideas.
Conceptual Framework: Hawkins (1985:252) defines conceptual framework as "the complex matrices of records in the memory, the cognitive maps which are used as references to assess and assimilate new information received through the senses, and the systems of attitudes and values which are modified continuously in response to external stimuli and internal reasoning".

Disinhibition (DIS): "factor seems to describe a more traditional type of sensation seeking, which seeks release and social disinhibition through drinking, partying, gambling, and sex. DIS reflects a traditional pattern of nonconformity through rebellion against strict codes about acceptable social behavior" (Zuckerman, 1976:103).

Experience Seeking (ES): Factor which seems to involve the seeking of arousal through the mind and senses through a nonconforming life-style loosely called 'hippie' in the 1960's, and through spontaneous, unplanned travel. A desire to have varied experiences" (Zuckerman, 1976:102).
Hemisphericity: In information processing, the individual relies more on one cerebral hemisphere than the other (Torrance and Mourad, 1979).

Metaphor: Likening of a concept or a word to another or linking of concepts and imagination. The metaphor bridges the two processes of the brain, providing a link between concept and imagination (Sanders and Sanders, 1984). The "ability to borrow ideas from one context and use them in another, or borrow a problem solution from a related problem" (Davis, 1983).

Play: A voluntary and spontaneous activity engaged in for its own sake. "Contemporary view of play from a psychological perspective emphasizes its role as a form of creative exploration, lending to stimulus-arousal and ultimately to creative enrichment and self-actualization" (Kraus, 1984:32).

Risk: The potential loss of something of value.

Sensation Seeking: "A trait defined by the need for varied, novel, and complex sensations and experiences and the willingness to take physical and social risks for the sake of experience" (Zuckerman, 1979:10). It also is defined in part by emotional concepts, by
emotion-related behavior (e.g. emotionally expressive actions in social situations), and by some of the same dimensions that are used to describe emotions (e.g. impulsiveness). Anxiety (fear) is complexly related to sensation seeking" (Izard, 1979:161).

Synectics: A process of making the strange familiar and the familiar strange. Making connections of apparently different and irrelevant elements (Gordon, 1961).

Thrill and Adventure Seeking: "The basic theme of the factor is summed up by item 'I sometimes like to do things that are a little frightening'" (Zuckerman, 1976:101).

Limitations of the Study

The findings of this study may be generalized to only the population involved.

Assumptions

The following assumptions were made for the purpose of this study.

1. Creativity is a component of a fully functioning person.
2. Creativity or creative ability can be enhanced or fostered.

3. Adventure activities can influence creativity.

4. Creativity is a form of problem solving.

5. All individuals of normal intelligence or above have creative ability.
CHAPTER II

LITERATURE REVIEW

Theoretical Model of Creativity

The focus of this literature review is to investigate components of sensation seeking and creativity in relation to adventure experience. Parallels of participants who are engaged in adventure experiences and creative individuals may be noted by examining literature related to the traits of creative individuals and those engaged in adventure experiences. Some of the parallel components noted in creativity are: sensation seeking (Davis, 1986), intrinsic motivation (Amabile, 1983; Adams, 1986; Reitz, 1987), challenge (Willings, 1987), risk (Arnold, 1962; Davis, 1986; Rothenberg & Hausman, 1976), play (Michaelis, 1980), flow (Csikszentmihalyi, 1975), openness to experience (Rothenberg & Hausman, 1976; Rogers, 1961; Roe, 1976; Davis, 1986), adaptation (Rogers, 1961; Zuckerman, 1976) drive (emotional, mental and/or physical) (Arnold, 1962; Hammer, 1984; Barron, 1969), and self-actualization (Rogers, 1961; Maslow, 1968). Another important component is the use of the senses in relation to exploration of the environment to increase
information acquired for problem solving. The following section discusses these components and their links to creativity and the adventure experience.

One of the links in identification of the creative person is strongly associated with the motivational trait of sensation seeking. According to Davis (1986:39) "A personality test called The Sensation Seeking Scale (Zuckerman, 1979) may be a better measure of creativeness than some creativity tests". Many traits of sensation seeking in relation to creativity were reflected in the findings of research conducted by Davis, Peterson and Farley (1974).

Intrinsic motivation may be a component of both the adventure experience and creativity. Adams (1986); Reitz (1987) and Parnes (1967) regard intrinsic motivation as a condition for creativity to occur. Amabile, (1983:87) notes: "...the intrinsically motivated state is essential for high levels of creativity because, under extrinsic motivation, attention is directed toward the attainment of the extrinsic goal and away from the exploration of new pathways". Csikszentmihalyi, (1975) relates autotelic experiences to intrinsic motivation in individuals engaged in rock climbing. Such experiences are apt to lead to flow which individuals engaged in adventure experiences and creative individuals have reported.
Intrinsic motivation also relates to effectance motivation (White, 1960) a theoretical construct used to explain behavior in relation to the absence of external reinforcement. Behaviors include exploration, curiosity, mastery, play and the person's attempt to deal with his/her environment.

Effectance motivation is characterized by a willingness to accept and a desire for challenge. The energy in this motivation is directed towards effectance and competence and these are often manifested in the resolution of optimal dissonance, challenge. (Pearlman, 1983:296)

Risk is a component of the creative personality (Arnold, 1962; Davis, 1986; Rothenberg, 1976), and an obvious characteristic of those engaged in adventure experiences.

Figure II, constructed by the author, offers a graphic representation of a model which builds on the work of Davis, Peterson, and Farley (1974) and Zuckerman (1979). Emanating from the optimal level of arousal can be intrinsic and/or extrinsic motivation which may lead to a status of sensation seeking. Found within sensation seeking are characteristics of boredom susceptibility, experience seeking, disinhibition, and thrill and adventure. Often the interaction of the traits result in risk, play, change and/or self-actualization. Where self-actualization is a product, flow manifests itself and in turn feeds back into the arousal stage.
FIGURE 2

THEORETICAL MODEL OF CREATIVITY AND SENSATION SEEKING
Optimal level of arousal relates to the amount of stimulation necessary for the organism to function at a level between anxiety and boredom/approach and avoidance due to stimuli. Zuckerman (1979) postulates that the optimal level of arousal varies within organisms with some seeking change which involves novelty, risk and exploration rather than adaptation.

Individuals may be low-arousable or high arousable, with the source of arousal categorized as intrinsic or extrinsic. Within the category of intrinsic is the amount of stimuli needed for the optimal level of arousal. These individuals, therefore, actively seek stimulation. Such seeking of stimulation may take the form of extrinsic sources such as variety, novelty, complexity and risk.

Creative individuals, being sensation seekers, would have a lower level of arousability (Davis, Farley, Peterson, 1974). Moving down the diagram, the concepts of intrinsic and extrinsic motivation appear. Intrinsic motivation is considered to be a key factor in creativity. Adams (1986:40) relates an environment to implement intrinsic motivation. Amabile (1983) and Reitz (1987) also note the significance of intrinsic motivation to the fostering of creativity. Extrinsic motivation, while not discounted, may take the form of sensation seeking for some, rather than material gains. This relates to Zuckerman’s (1973) idea that individuals low in arousability seek extrinsic arousal.
Included in the concept of extrinsic is fantasy. An individual utilizes fantasy when the environment does not provide the necessary stimulation. In regard to the creative individual, fantasy is listed as a necessary component of creativity.

Optimal level of arousal, tempered by intrinsic motivation and a search for the necessary stimulation to obtain the optimal level of arousal, manifests into the motivational trait of sensation seeking. Sensation seeking, according to Zuckerman (1979), is composed of four factors: thrill and adventure-seeking, experience seeking, disinhibition and boredom susceptibility. Each of these four factors has a counterpart in relation to the traits of the creative person.

Risk is a component of the creative personality (Arnold, 1962; Davis, 1986; Rothenberg, 1976). Several other components of creativity relate indirectly to risk. Some of the other components are: Traits such as openness to experience, (Rothenberg, 1976; Rogers, 1961; Roe, 1976; Davis, 1986); spontaneity (Rothenberg, 1976); ability to play with concepts (Rogers, 1961; Patterson, 1985); not frightened by the unknown (Maslow, 1968); ability to express ideas without fear of ridicule (Maslow, 1968); obstacles perceived become a challenge (Willings, 1987); rebelliousness (Hammer, 1984); and not afraid of feelings of sex, anger, competition, struggle or hostility, (Barron,
1969). The concepts of risk, play and change are seen in this model as an interaction. When risk is taken (either from dissonance, sensation seeking or relating to positive self-concept), the propensity for change greatly increases. Moving from change to risk, change (or the active seeking of novelty) involves an element of risk. The movement between risk and change might then be seen. Both imply new directions, are related to creativity and have similar cultural and emotional responses (Adams, 1986:3).

Play as exploration involves the elements of both change and risk, and is a necessary component of creativity. The "child-like" quality (Maslow, 1968; Michaelis, 1980) of the creative includes play. Play involves the right hemispheric functions, includes fantasy, discovery, adventure, and increases motivation through exploration. Potential responses are increased in this manner, culminating into more options for future problem solving (Michaelis, 1980). Play also relates to the four factors of sensation seeking. As was previously mentioned, play involves adventure. Children (and in some cases adults) at play become less inhibited when totally involved in an activity. Because of the exploration involved, experience is also gained through play. Boredom susceptibility may also be confronted through play or fantasy. Openness to experience, a trait of creative individuals (Rothenberg &
Hausman, 1976; Rogers, 1961; Roe, 1976; Davis, 1986 and Montague, 1973), is related to children and play.

Self-actualization is regarded by Maslow (1968) as an intricate part of creativeness. The author dicotomizes creative people into self-actualized creatives and special talent creatives. Herein is the explanation of many a theory that creative individuals may be mentally unstable. Special talent creatives may be well adjusted, reasonably happy or neurotically disturbed and unhappy. In contrast, the self-actualized creative are mentally healthy, live full productive lives, tend to do everything in a more flexible, creative fashion, and may or may not be brilliantly creative in an area such as science, music or art. Self-actualized creativeness comes more directly from the personality.

Risk and change are related to creativity in that some of the greatest learning experiences are related to life experiences that involve tragedies, deaths, traumata, conversions, and sudden insight (Maslow, 1968). This is much like Ferguson's (1980) idea that significant experiences are necessary for growth. Maslow (1968:61) elaborates on the involvement of fear of knowledge. "And so we find another kind of resistance, a denying of our best side, of our talents, of our finest impulses, of our highest potentialities, of our creativeness." Maslow continues to explain that curiosity and exploration are higher needs than safety. This relates to the interaction of exploratory play
to change and risk. By now addressing the conceptual framework, in relation to dissonance, we find as Maslow (1968:65) states: "...we can seek knowledge in order to reduce anxiety and we can avoid knowing in order to reduce anxiety". At this point:

We wind up with a dialectical back and forth relationship which is simultaneously a struggle between fear and courage. All those psychological and social factors that increase fear will cut our impulse to know, all factors that permit courage, freedom and boldness will thereby also free our need to know. (Maslow, 1968:67)

Rogers (1961:193) holds a similar view.

I believe it will be clear that the person who is involved in the directional process which I have termed 'the good life' is a creative person. With his sensitive openness to his world, his trust of his own ability to form new relationships with his environment, he would be the type of person from whom creative products and creative living emerge.

We again find the element of adaptation of creatives in regard to changing environment, a concept regarded by Zuckerman (1979) to be related to the sensation seeker.

A component of the flow phenomenon (Csikszentmihalyi, 1975) is a loss or transcendence of self-consciousness. The individual is in control of his/her actions and environment. Change and play are also related to flow. Investigation of the environment, through play or seeking change, promotes intrinsic rewards. In all forms of deep play, there are the components of control over the choices of challenge levels
and a degree of uncertainty. A degree of uncertainty is always implicit and necessary for deep play. Flow is then related directly to autotelic experiences which maximize immediate intrinsic rewards. Authors such as Adams (1986), Reitz (1987), and Parnes (1967) relate intrinsic motivation to creativity.

In this model, flow then leads back to increased optimal level of arousal. The optimal level of arousal is increased by having increased intrinsic motivation, sensation seeking, risk, change, play and the experiences of reaching toward flow and self-actualization. Encompassed within this model are found the primary components of creativity. Each component can be broken down into sub-components as was mentioned previously. For example, risk and change are also associated with anxiety, fear of failure, and values.

Definition

Concepts are presented by Young (1985), Rogers (c.f. Holsinger, Jordon and Levenson, 1971), Davis (1983) and Csikszentmihalyi (1975) that may be regarded as substantiating the necessity for alterations within the conceptual framework to foster the process of creativity.

A conceptual definition of creativity according to Young, (1985) is presented as what an individual does or makes, or what an individual is. The context of what an
individual is includes moving beyond our past experiences in order to "become what we can be. Thus creativity consists of those attitudes by which we fulfill ourselves" (Rogers, cf Holsinger, Jordon and Levenson, 1971). Rogers also addresses the concept of creativity within the individual's ability to employ past experiences, integrating flexibility and, therefore, utilizing the uniqueness of each individual. "My definition, then, of the creative process is that it is the emergence in action of a novel relational product, growing out of the uniqueness of the individual on one hand, and the materials, events, people, or circumstances of his life on the other" (Rogers, 1961:350).

The seemingly fundamental question arises immediately; what is creativity? Several researchers have found that definitions are dependent upon the context of application. Freedman (1976) and Ackoff (1981) each found several hundred definitions of creativity (Rickards, 1985). An important aspect in answering the question concerning the relationship between adventure-based education and creativity is consideration of the individual's conceptual framework. Hawkins (1985) work gives us some insight. Although creativity has been defined by numerous authors, certain components deserve consideration as they relate to alterations within an individual's conceptual framework.

Wallas (1926), one of the pioneers in the study of creativity and the creative process, derived four stages to
comprise the creative process. The four stages of creative thinking are: preparation, incubation, illumination and verification.

Preparation, the first stage, is defined by Davis (1986:62) as "clarifying the situation, perhaps looking for the 'real' problem, thinking about requirements for a good solution, gathering and reviewing relevant data." In the second stage, incubation, the individual is not consciously thinking about the problem. It is believed at this point that the unconscious is at work. The removing of oneself consciously from the problem may take two forms; either consciously working on another problem, or in the form of relaxation from mental work. Incubation may last from seconds to hours to weeks. Illumination is the stage of "ah-ha", sudden insight, the birth of an idea. This is an association, a fitting of the parts into the whole. Verification, the final stage closely resembles the first stage in that conscious thought is needed to test the ideas.

Creativity may also be viewed as a mode of problem solving ability (Gordon, 1961; Koberg and Bagnall, 1981; Parnes 1967). Gordon (1961:3) in the context of synectics theory, views creativity as a process of joining together "different and apparently irrelevant elements." Within this mode of problem-solving the individual is using the conscious to get at the pre-conscious.
Koberg and Bagnall (1981:16-17) note that within creative problem solving there is a necessity for a series of "events, stages, phases or design stages". These consist of:

ACCEPT THE SITUATION—accepting the problem as a challenge, letting the problem generate the process, giving up autonomy.

ANALYZE—knowing the facts and feelings of the problem.

DEFINE—deciding on the main issues, clarifying and conceptualizing the goals.

IDEATE—exploring all possible means of realizing the goal.

SELECT—comparing defined goals with ways of achieving them.

IMPLEMENT—transforming our "best ways" into physical forms.

EVALUATE—evaluates effects and ramifications. Degree of progress is also evaluated.

Each of the stages is considered as being in process, not a lineal relationship of progressing from one stage to another. The foundation for a definition of creativity may be drawn from various authors. This foundation uses concepts of the life process, a facet within the total personality. In this regard the product, which according to Jackson and Messick (1967) is an intricate part of creativity, will not be considered in depth. Jackson and Messick believe the product must be novel, unique, and appropriate to society. The novel ideas of a schizophrenic, for example, would not be conducive to societal norms.
Authors such as Rothenberg and Hausman (1976) also consider the product an important component of creativity. An important consideration remains that creativity need not be viewed as strictly the value or the newness of a product, but in relation to three components: an agent, a process and a product.

Farnes (1967:6) defines creativity in terms of "behavior as that which demonstrates both uniqueness and value in its product." Rogers' (1961:349) definition of creativity refers to elements which are part of the creative process, referring to an observable product: novel constructions. Novelty grows out of unique qualities of the individual in the interaction with materials and experience. Davis (1983:2) views being creative in a more global sense: "Being creative is exploring new places and new ideas. Being creative is developing a sensitivity to problems of others and problems of mankind. And being creative is using your imagination to invent lots of new ideas to solve problems."

Just as the exploration of the meaning of creativity and consideration of the conceptual framework is germane to the questions concerning the relationship between adventure based education and creativity, so is what Peters and Waterman (1982) call "contradictions within human nature" and a humanistic environment. When considering accepted by society, or conducive to societal norms, a tendency to view
novel ideas may become limited and confined. Biases are developed, placing undue emphasis on environmental and societal correlates of creativity.

Traits

Most theories (personality or general) of behavior may be divided into three areas of thought (psychoanalytic, humanistic, or behavioristic) which attempt to explain creativity (Woodman, 1981). The psychoanalytic theories include works of Freud, Jung, Rank, and Kris. Freud viewed creativity and mental illness as having the same origins within the individual. Both creativity and mental illness arise from conflict. Jung saw creative processes as an interaction between the conscious and unconscious mind. The act of creating is also influenced by the collective unconscious. An artist transforms the archetypal themes of the collective unconscious which accounts for the universal appeal of art (Rothenberg and Hausman, 1976:121). Rank saw the artist in conflict with society. "The creative impulse then may be considered the pressure of desire to be an individual (life impulse) in the service of the individual will." "Rank viewed the creative individual as representative of ideal functioning or ideal mental development in the human being" (Woodman, 1981).
Kris, a psychoanalytic ego psychologist, explains creativity in terms of "regression in the service of the ego" (Rothenberg and Hausman, 1976:135). Emphasis was placed on the role of pre-conscious thinking and fantasy. In his work, he distinguished between regression in the creative process and regression in psychotic states. According to Kris there is a relationship between creativity and passivity, and "the integrative functions of the ego include self-regulated regression and permit a combination of the most daring intellectual activity with the experience of passive receptiveness" (cf Rothenberg and Hausman, 1976:143). Creativity stems from the pre-conscious and is capable of being brought into consciousness with proper conditions.

Humanistic psychologists include Maslow and Rogers. For Maslow, creativity was integrated with self-actualization, and all humans have the potential for becoming creative. Maslow noted that truly creative individuals can be childlike while at the same time mature, integrating primary and secondary process thinking. He also made a distinction between "special talent creativeness" and "self-actualized creativeness".

The consequence was that I found it necessary to distinguish 'special talent creativeness' from 'self-actualizing creativeness' which sprang more directly from the personality, and which showed itself widely in the ordinary affairs of life, for instance in a certain kind of humor. (Maslow 1968:137)
Maslow related an element in the conscious or another kind of consciousness that all possess, either weakly or strongly, as "intrinsic conscious" (Maslow 1968:7). This intrinsic conscious "is based upon the unconscious and pre-conscious perception of our own nature, of our own destiny, of our own capacities, of our own 'call' in life." Maslow also saw a denial of talents, potentials and creativeness. This denial is related to curiosity and exploration, higher needs in relation to safety.

It seems quite clear that the need to know, if we are to understand it well, must be integrated with fear of knowing, with anxiety, with needs for safety and security. We wind up with a dialectical back and forth relationship which is simultaneously a struggle between fear and courage. All those psychological and social factors that increase fear will cut our impulse to know; all factors that permit courage, freedom and boldness will thereby also free our need to know. (Maslow 1968:67)

Carl Rogers (1961:193) believes the individual involved in the "good life" "is a creative person. With his sensitive openness to his world, his trust of his own ability to form new relationships with his environment he could be the type of person from whom creative products and creative living emerges". Some of the qualities of an individual involved in the "good life" are: The person does not necessarily adjust to culture, non-conformity, most likely to survive and adapt under changing environmental
conditions. An implication is the adaptability of such individuals to "survive" the educational systems, for as Rogers (1961:347) explains: "In education we tend to turn out conformists, stereotypes, individuals whose education is 'completed' rather than freely creative and original thinkers".

Rogers (1961:354) also lists the conditions within the individual that are associated with the creative act.

1. Openness to experience. It means lack of rigidity and permeability of boundaries in concepts, beliefs, perceptions, and hypotheses. It means a tolerance for ambiguity where ambiguity exists. It means the ability to receive much conflicting information without forcing closure upon the situation. (Rogers, 1961:354)

2. An internal locus of evaluation. A fundamental condition of creativity which allows judgement to come from within the individual and not from praise or criticism of other individuals, intrinsic evaluation.

3. The last element is the ability to play with concepts and elements and is associated with openness and lack of rigidity.

The behavioristic theories are in general not as concerned with theories of personality. Woodman (1981:58) sums the behavioristic stance toward creativity. "Creative behavior, despite its originality, is nevertheless learned and may be explained in stimulus-response terms."
Woodman (1981:51) states that within the last few decades theories fall into a category which Taylor (1975) calls "trait factorial." This theory emphasizes personality traits or characteristics of individuals as a means of relating to creativity.

Traits of creative individuals are numerous and the profile that emerges reflects an individual who takes risks (Davis, 1983; Arnold, 1962; Rothenberg & Hausman, 1976; Reitz, 1987; Sisson, 1985) is adventurous (Davis, 1986), engages in sensation seeking or stimulation activities, (Davis, 1983), and is open to experience (Rothenberg and Hausman, 1976; Rogers, 1961; Roe, 1976; Davis, 1983; Montague, 1983). Drive (emotional, mental, and/or physical) is also listed by numerous authors (Arnold, 1962; Davis, 1983; Hammer, 1984; Barron, 1969; Patterson, 1985; Montague, 1983).

An important trait of creative individuals relates to a child-like quality. Montague (1983:271) addresses the concept of neoteny, defined as: "The retention of fetal or juvenile traits by retardation of developmental process. Same as paedomorphosis." The author views the traits of childhood as valuable, but disappearing with age. These traits include:

- curiosity (most important)
- imaginative
- playfulness
open-mindedness
willingness to experiment
flexibility
humor
energy
receptiveness to new ideas
honesty
eagerness to learn
need to love
accept change without defensiveness

The traits associated with the child parallel the traits associated with creativity, and include: playful, childlike, curious, adventurous, spontaneous, high risk taking, self confident, reflective, attracted to the mysterious, at ease with change, and open-minded. Creative people are also more apt to take up skiing, parachute from an airplane, try mountain climbing, be hypnotized, work in a foreign country and explore strange cities without a guide. (Davis, 1983:25).

In essence, an individual must possess the qualities of the child to become creative (Davis, 1983; Michaelis, 1980; Maslow, 1968). These qualities are socialized out of the individual as he/she matures. Lord, Hutchison and VanDerbeck (1980:230) in an adaption from Hodges, contrast the socialization of the child and the professional,
stating: "Professionalism is a way of thinking and acting, which reinforces fragmentation and control, rather than unity and change."

**THE CHILD**

spontaneous, unrestrained
risk-taking, adventuresome
change seeking
intuitive, affective
open-minded
innovative, exploratory
at ease with chaos, disorder, mystery

**THE PROFESSIONAL**

self-restrained, inhibited
cautious, fearful of the unfamiliar, security oriented,
stability seeking
logical, cognitive
closed-minded
conventional, custom-bound
fearful of the unstructured, undefined

(Lord, Hutchison and VanDerbeck, 1980:230)

**FIGURE 3**

Comparison of the Socialization of the Child and Professional

**Conceptual Framework**

Experiences continually contribute to our perceptions of reality. Hawkins (1985:252) defines conceptual framework as:

... the complex matrices of records in the memory, the cognitive maps which are used as references to assess and assimilate new information received through the senses, and systems of attributes and values which are modified continuously in response to external stimuli and internal reasoning.
The conceptual framework is a three-dimensional matrix of experiences, influenced by external forces which are received as messages from the external world and tempered by genetic proclivity. By drawing from past experience (in essence filtering information through the conceptual framework) openness to experience becomes an indispensable component with relation to fostering creativity. Experience, according to Bishop and Jeanrenaud (1980:86), is associated with exploratory play and helps to develop a repertoire of responses to combine, creating a novel pattern of behavior. Assimilation play also contributes to creativity, whereas the individual develops specific skills or perfects skills or understanding of a situation or task. The more experience, the larger the functioning framework. More possible combinations of existing information are then generated to produce new or novel responses. Davis (1983) also views the creative process as a lifestyle, a personality trait, a way of perceiving the world, a way of interacting with other people and a way of living and growing.

It is impossible for an individual to perceive the environment objectively (Hawkins, 1985; Boulding, 1961). The "experience becomes personal", "has no objective value", but can be initiated within the learner. The experience itself then will be "personal, subjective and dependent upon the uniqueness of the learner" (Moustakas, 1969:20).
Each experience is filtered through the individual's conceptual framework and affects the manner to which the experience is responded, based on previous experience. According to Hawkins, some individuals may have a more elaborate conceptual framework from which to function. In this case, the individual becomes more aware of the environment. Hawkins' conceptual framework parallels what Boulding (1961) refers to as "the image".

It is in this context that authors such as Sanders and Sanders (1984:33&35) advocate an understanding of student's skills while utilizing experiential education. Children view the world as a process and respond to it as such. They have not as yet been socialized into the primary view of the world from which most adults function. A child, involved in active learning, approaches experiences through play, fantasy and metaphor. Each of the preceding relates to right hemispheric functioning. When such methods are utilized the individual relates a new experience to experiences within the conceptual framework. Children are by nature creative, utilizing right hemispheric functions, but as the child grows, the imagination, spontaneity, and creative aspects are replaced by a more logical analytical mode of thought within the conceptual framework.

Maslow (1968:138) lists characterological qualities of a self-actualized person. The qualities include: boldness, courage, freedom, spontaneity, integration, and self-
acceptance. Maslow also relates the qualities of creative individuals to qualities associated with a child:

Another observation was that creativeness was in many respects like the creativeness of all happy and secure children. It was spontaneous, effortless, innocent, easy, a kind of freedom from stereotypes and cliches. And again it seemed to be made largely of 'innocent' freedom of perception, and 'innocent' uninhibited spontaneity and expressiveness.

Csikszentmihalyi (1975), in describing the elements of a "flow experience" (a holistic sensation that people feel when they act with total involvement), takes into consideration factors including merging of action and awareness. These factors parallel the implication of a "conceptual framework" and lead to the necessity of transcending ego boundaries. Ego is regarded as a construct imposed between self and environment, correlated and regarded as a distortion in chronological and psychological time. An implication remains for the need of a holistic approach to take into account an individual's goals, abilities and subjective evaluation of the external situation in order to alter the individual's conceptual framework.

Flow

Flow, described as "a holistic sensation that people have when they are acting with total involvement" (Csikszentmihalyi, 1975:36), is present in all forms of deep
play. According to Csikszentmihalyi (1975: ) the term "deep play" was used by British philosopher Jeremy Bentham and was used to describe play that was "irrational" with high risks. The author gives the example of rock climbing as a form of deep play "in the sense of involving an extreme wager which acts as a vehicle for the deeper personal and cultural interest of the participants who risk it". Csikszentmihalyi (1975:62) suggests that deep play as in rock climbing gives "... a heightened concentration and enforcement of attention boundaries (this) is achieved through the addition of risk to the intellectually engaging aspects of the activity."

Challenge, in relation to the individual’s skills, and a degree of uncertainty are implicit and necessary to the process. "... People who enjoy what they are doing enter a state of ‘flow’: they concentrate their attention on a limited stimulus field, forget personal problems, lose their sense of time and of themselves, feel competent and in control, and have a sense of harmony and union with their surroundings" (Csikszentmihalyi, 1975:182).

A flow activity is an activity that makes flow experience possible. Such activities provide opportunities for action which match a person’s skill, attention is centered on a limited stimulus field, irrelevant stimuli are excluded, the individual has a feeling of competence and control, there is a merging of action and awareness, and immediate, consistent, unambiguous feedback is given.
There are two types of flow experiences, microflow and macroflow. Microflow activities, indispensable for normal functioning, appear to give little positive enjoyment, and are simple unstructured activities. Macroflow occurs in structured complex activities and leads to greater flow experiences.

Csikszentmihalyi (1975) relates the flow experience to autotelic activities. Autotelic activities are patterns of action which maximize immediate intrinsic rewards to the participant. Activities may be both intrinsically and extrinsically rewarding. "The intrinsic dimension, however can be a powerful source of motivation, either alone or in conjunction with external rewards" (Csikszentmihalyi, 1975:22). Autotelic experiences occur more frequently in individuals who are responsive to intrinsic rewards. Adams (1986:70) notes tasks that are inherently challenging and motivated by intrinsic rewards are approached more creatively. The environment also needs to be "light on evaluation and judgement" (Adams 1986:140). Reitz (1987:189) and Parnes (1967:11) also relate intrinsic satisfaction as an element in creative growth. Amabile (1983:202) states: "Creativity can be further fostered by a clearly intrinsic motivational orientation toward work. Intrinsically satisfying aspects of work should be emphasized in training and in working environments and extrinsic motivations should be discouraged."
Activities that implement change and engage the individual in flow relate directly to creativity. Parallels between flow and change relate indirectly to play. Play involves learning by discovery thus presenting numerous combinations of information. Play also provides intrinsic rewards and, in a humanistic environment, provides challenges that match the individual's skill level, loss of ego, and sense of control over the environment. The flow experience is similar to Maslow's peak experience and, according to Csikszentmihalyi, occurs in part when an individual perceives capabilities and opportunities evenly matched. Maslow (1968:73) states in reference to the peak-experience: "...moments of highest happiness and fulfillment I shall call the peak-experience". Some of the experiences include: basic happenings in the B-love experience, the parental experience, the mystic, or oceanic, or nature experience, the aesthetic perception, the creative moment, the therapeutic experience, certain forms of athletic fulfillment, etc." B-cognition relates to lack of judging, comparing, and evaluating. This is in regard to oneself. Maslow (1968:79) continues in regard to the peak-experience: "The peak-experience is felt as a self-validating, self-justifying moment which carries its own intrinsic value with it". He also points out that in all peak experiences there is a "characteristic disorientation of time and space" (Maslow, 1968:80), and that "the
emotional reaction in the peak-experience has a special flavor of wonder, of awe, of reverence, of humility and surrender before the experience as before something great" (Maslow, 1968;88). The unity of the world is also seen. Loss of fear, defense, control, and anxiety are also listed as factors of a peak-experience.

The effects of peak-experience are listed as follows: (Maslow, 1986;101)

1. Peak-experiences may and do have some therapeutic effects in the strict sense of removing symptoms.
2. They can change the person's view of himself in a healthy direction.
3. They can change his view of other people and his relations to them in many ways.
4. They can change more or less permanently his view of the world, or of aspects or parts of it.
5. They can release him for greater creativity, spontaneity, expressiveness, idiosyncracy.
6. He remembers the experience as a very important and desirable happening and seeks to repeat it.
7. The person is more apt to feel that life in general is worth while, even if it is usually drab, pedestrian, painful or ungratifying, since beauty, excitement, honesty, play, goodness, truth,
and meaningfulness have been demonstrated to him to exist.

Play is also addressed within the flow phenomenon theory. Csikszentmihalyi (1975) suggests that flow can be learned and has the potential for facilitating a merger of the traditional dichotomy of work and play. In research conducted by Csikszentmihalyi (1975) the effects of flow deprivation in relation to self-perception, were reported as less creative. He states that the cognitive effects of flow deprivation were:

- a decline in creativity—as measured by the subjects’ own reports and by actual scores on tests of spontaneous creativity—is a major effect of deprivation, we can probably conclude that microflow is a form of micro-creativity; choosing how to pattern experience could be the most simple and most basic manifestation of the creative process.

(Csikszentmihalyi 1975:169)

Environment

Within the creative process Stein (1962:90) and Moustakas (1969:19) also acknowledge the merger of self in relation to the individual and merger of the self with the environment and creation. Being placed in a state of flow appears to be essential for a fully functioning person Csikszentmihalyi (1975:161,170). Individuals in a state of flow deprivation reported a change in physical states (more tired, headaches, less relaxed, lessened alertness). Changes were also noted in self-perception (less creative
and less reasonable) and in cognitive performance (decline in creativity); general effects included tension, hostility, anger, irritation, more depressed, less active and more angry with problems.

Reitz (1987:194) states that creative behavior is a function of both ability and motivation. The environment an individual is placed in greatly contributes to the creative process. Reitz continues in relation to organizations aiding or impeding creativity and innovation through the created environments.

Components necessary to create an environment conducive to fostering creative potential may be divided into internal and external environments. Internal environments include: openness, playfulness, active learning, readiness to learn, transcending one's image of oneself, empathy (Gordon, 1961), expectancy of change (Adams, 1986), self-confidence and independence (Davis, 1983).

External environment relates to a humanistic environment being established. Openness to external and internal experience need to be encouraged to foster creativity. "Creativity depends on autonomy and independence" (Stein 1962:91). Rogers (1961:358,359) regards the conditions necessary to foster creativity as including the establishment of the external conditions that will foster the internal conditions. This is established by setting up conditions of psychological safety and freedom.
Freedom also means being responsible and includes the freedom to be afraid of, as well as eager for, new experiences and to take responsibility for the consequences of mistakes as well as achievements.

Psychological safety (Rogers, 1961) includes three processes: (1) Accepting the individual with unconditional worth. The individual needs to sense a climate of safety. (2) Within the climate external evaluation is absent. (3) Empathetic understanding of the individual.

Patterson (1985:105) elaborates on the components of a climate of warmth and mutual trust (comparable to a humanistic environment) as an essential factor in fostering creativity. Cooperation, not competition, is also viewed as essential to establishing a climate to foster creativity. Support and communication at the interpersonal level also contribute to the creative climate.

Managers who provide their employees with support and who tolerate risk taking and occasional failure provide the kind of climate in which high levels of creativity and innovation can be developed. Creative behavior deals with uncertainty, which requires support and communication at the interpersonal level. (Reitz, 1987:193)

Ferguson (1980) and Moustakas (1969) view the facilitator’s role of not only accepting the learner, but when appropriate, advocating challenge. “Both acceptance and challenge have a place; the one process recognizes and encourages immediate expressions of the self, the other
recognizes and encourages new involvement and commitment" (Moustakas 1969:44-45).

Correlating concepts pertaining to creativity appear throughout the literature. Components that are necessary to create an environment conducive to fostering creative potential include such components as: openness, playfulness, active learning, readiness to learn, transcending one’s image of oneself, empathy (Gordon, 1961), expectancy of change, (Adams, 1986), self-confidence, and independence (Davis, 1983). The individual must also be receptive (Alamshah, 1971).

Alamshah (1971:33) lists the conditions necessary for receptivity: openness, learning and singleness of intent. Likening receptivity to pouring wine from a bottle, the cork first needs to be removed, and secondly one needs an empty glass. Removing the cork, the author continues, is analogous of the first step in receptivity—removing biases, prejudices, and misconceptions. The problem is to discover what constitutes these blocks in the value system or world view, (conceptual framework).

Suggestions such as exposing ourselves to more data and stimuli are made in regard to removing blocks in an individual's value system. Rationale for this exposure consists of what Adams (1986) refers to as meeting "with ideas or viewpoints which unduly unsettle us". This idea in actuality is a break or a flexibility in the conceptual
framework. Individuals, while firm in their convictions, often do not consider alternatives to present patterns of thought or behavior. The individual remains comfortable functioning from the present parameters. Maslow (1968:39) lists single life experiences as the most important learning experiences reported to him by his subjects.

"...experiences such as tragedies, deaths, traumata, conversions, and sudden insights which forced change in the life-outlook of the person and consequently in everything he did" (Maslow, 1968:39).

In this regard, stress becomes a vital component to stimulate personal growth. "Anything that disrupts the old order of our lives has the potential for triggering a transformation, a movement toward greater maturity, openness, strength" (Ferguson, 1973:173). When the everyday events of our lives are disrupted there is potential for change and stress is one of the great motivators of change. The stress may be personal, family problems, job related, the death of a friend, economic, or even success. Subtle stress also produces the potential for change and includes intellectual stress (cognitive dissonance), a relationship with someone who's views differ greatly from established views, or concepts presented from reviewing literature.

As a society, the majority of individuals resist change and seek to avoid stress, but out of stress comes change,
growth, or perhaps an affirmation of the individual’s functioning framework.

**Socialization**

Divergent thinking, while recognized within some organizations as an essential component necessary to maximize the resources of employees, still remains the subject of debate. Western culture does not readily accept this form of thinking, and places emphasis upon the logical linear functions that are associated with the brain’s left hemisphere. Authors such as Reitz (1987), Rothenberg (1976), Samples (1976), Sanders and Sanders (1984) and Staley (1979) have given consideration to the fact that western culture, past and present, has been and remains prejudiced against right hemispheric thinking, the thinking associated with the creative aspect of human development. Underlying cultural conceptions promote left hemispheric functions within organizational and educational systems.

According to Samples (1979), children play and become involved in their activities, dancing, chanting, pretending; they sit on the ground and watch the life that is going on around them. Young children have not as yet been socialized into finding such activities unacceptable. An adult will become uncomfortable with a child’s approach to problem solving and try to lead them back to where the adult feels comfortable.
"mental attitudes," included self-reliance, playfulness and a willingness to "go against the rules." When children play, the techniques associated with creativity are employed. Play includes adventure, challenge, activities are explored with imagination. Play also includes flexibility, change, spontaneity, fantasy and feeling.

Michaelis (1980:73) supports this:

As children we had tremendous potential creativity within us and exercised it because in a very existential way we knew what play was all about. We had adventures, challenged ourselves, played made-up games with made up rules, explored new areas of the world in our heads and in activities. We knew what play was about because it included such elements as flexibility, change and spontaneity. Fantasies were allowed and feelings were exercised.

(Michaelis, 1980:73)

Numerous authors address the educational system in regard to the lack of acceptance of the traits of creativity in children by the socialization processes. May (1981) suggests that such students avoid seeking real knowledge. Novak (1981) contends the child's natural capacity is so damaged by "ego assaults" that they become "learning disabled". Barron (1969:176) makes the assumption that children have the potential for creative expression, but it becomes diminished or lost as adulthood approaches. He states that few adults:

seem to be spontaneously imaginative and free in expression. Most adults rarely play or sing or paint or make up new words or expressions; the Muses seem to prefer children. The question is this: Does the loss of potential for creative expression
Sanders and Sanders (1984:2) state: "It seems, however, that in our pursuit of linear knowledge we have forgotten the simplicity and effectiveness of strategies that teach through devices that are creative, metaphoric, and 'right brain'."

"The role of metaphoric thinking is to invent, create, and to challenge conformity by extending what is known into new meadows of knowing" (Samples, 1976:19). Conceptual frameworks are altered, but foundations are built from the ground. Through such programs children may develop positive self concept, face challenges and succeed, regard failure as only a learning experience and gain a respect for the natural world. Such a program should contain the most general and abstract kinds of thought that include the whole range of human experience in conjunction with logical analytical thought, with the objective of fostering new knowledge. "The role of metaphoric thinking is to invent, create, and to challenge conformity by extending what is known into new meadows of knowing" (Samples, 1976:19).

Patterson (1986:106-107) grouped 120 reported techniques for fostering creativity into four sections. The first section included techniques based on an Eastern philosophy with the aim of "consciously getting into the unconscious." The second section related to visualization processes and imagery, while the third section contained the "classics"—for example, brainstorming. The final section,
occur as a consequence of some organic law, or is it that we learn to inhibit creativity in ourselves? (Barron 1969:176)

Tolliver (1985) describes an environment where the "tournament method" of socialization is used within our educational systems. Contrast this method to an environment where acceptance and respect are given in fostering the growth of the individual in both the intellectual and emotional realms. The tournament method is a "winner take all" situation used for the removal of students; the creative, nonconformist ones, by repeatedly trying to change them. The author states that the students are subjected to experiences to induce stress, isolation, failure, and dissatisfaction. Some of the dysfunctional effects of the method are: low risk taking, insecurity, a "fawning obedience to authority", and in the author’s view, the most damaging is a "utilization of adversarial methods of evaluation". The conflict becomes "personalized" and "judgmental", with the outcome of such tactics being the use of power. The emphasis becomes a win-lose situation and a narrow viewpoint is the end result for both parties. The issues are then settled through power (grades) or authority.

Boulding (1983:12) contends that the formal education system creates an atmosphere in which is developed "...something of an adversary relationship between the teacher and the learner, in which the learners identity is not reinforced and thus the failures and mistakes that are
an inevitable accompaniment of learning can easily be interpreted as failures of identity." Failures of identity relates to a sense of loss of self. Boulding believes that we "essentially learn by failure". College students become aware of this and in many cases, valued people have trouble in their studies because of the anxiety that knowledge causes. May (1983:75) continues to suggest that such students avoid seeking real knowledge. "They (students) hold off the anxiety of knowledge by garnering mere facts." Tolliver (1985:34) contends that "A cynicism develops concerning the generation of ideas. It rapidly becomes all too apparent to the creatively gifted that the central concern of a `scholar' should be `will it sell' not `is it right?', or `does it please me?'. Tolliver continues, "The student writes to our biases; suppresses disagreement and questions; and attempts to reformulate our ideas in his language. Beliefs, intuition and evidence become irrelevant when generating this intellectual equivalent of junk food."

**Ostracism**

When one engages in a creative lifestyle, ostracism may occur and the individual is looked upon as deviant (Michaelis, 1980). Haustein and Maier (1985:139) refer to "ideologies and ignorance about creativity." "Attitudes against creative people, uncreative atmosphere, anxiety for the future and alienation" are listed as the obstacles
within the "creative period". Lord, Hutchison and VanDebeck (1980) report that adults in our society are security oriented and have become less playful. Risk, change and choice are necessary elements in human growth, development and experience. Examination is suggested between the interrelatedness of the playful creative self and what the authors term "professional dominance".

There are, however, facets of human nature that appear contrary to Western culture. Peters and Waterman (1982:55-56) consider a list of contradictions within human nature, that are taken into account by excellent companies, that make them "effective in engendering both commitment and regular innovation" from their people. In part, the list addresses such issues as: we are all self-centered, use our right hemispheric brain at least as often as our left analytical hemisphere, can retain very little explicit information in our mind, but have a "vast storehouse of patterns" in our unconscious mind, most businesses underestimate the value of experience as a teacher, we are influenced greatly by our environment by being sensitive and responsive to "external rewards and punishments", we really don't fool people by our words which contradict our actions, and we need independence and meaning in our lives (Peterson and Waterman, 1982:55-56).

The frameworks from which an individual functions may be broad based or limited and confining. Most generally, an
individual functions from the latter. Ego assulting may be interpreted as a fear of knowledge (Novak, 1983). Roe (1976:174) contends that all humans have creative potential and because of cultural institutions it is repressed instead of encouraged.

...there is real creative potential in all human beings and that our cultural institutions, rooted in ancient misconceptions of the nature of man and his place in the universe, are enormously more effective in repressing it than encouraging it, our problem is not just to find the people who have somehow been able to resist these pressures. It is also to find ways to change the cultural climate. (Roe, 1976:174)

Acceptance is not always the environment in which students are placed. What is the purpose of any educational system? As previously stated, creative insight is the foundation of new knowledge. An individual placed in a situation where stress, acceptance, and challenge are the motivational factors experiences growth, and from growth comes creative insight.

Metaphoric education is perhaps an alternative to the "intellectual junk food" and is acceptable also within a scientific endeavor. Samples (1976:90) writes "... those who avoid metaphoric thinking in science almost always give up a chance at the kind of creative insight that usually figures in achievements worthy of a Nobel prize".
McInnis (1971) elaborates:

Our present teaching methods, at all levels of education tend to foster a common intellectual skill, thinking the world to pieces, this skill is essential, analysis, reductionism, specialization, departmentalization--our various techniques for fragmenting our knowledge of the world have made possible humankind's technological progress. We would not want to abandon our ability to think the world to pieces. As one of history's most sensitive ecologists put it, 'The first law of intelligent tinkering is to save all the parts. But thinking the world to pieces is only half the understanding.'

A climate of warmth and mutual trust reflects a humanistic environment, wherein the individual has permission to be free; to be afraid of a new experience as to be eager for them, to be free to face and be responsible for the consequences of mistakes as well as achievements (Rogers, cf. Jordon and Levenson, 1971).

Risk and Change

Openness relates to creativity and change, which Adams (1986) considers to be two sides of the same coin. Both imply new directions and are associated with uncertainty. They have similar cultural and emotional responses such as risk, anxiety, fear, and disapproval. The author also states that learning is related to creativity in that both involve change and new relationships. Most individuals resist change because it is a threat to self and involves re-evaluating a value system. When placed in a situation of stress or cognitive dissonance, risks are necessitated.
Risk appears to be both a motivating factor and a deterrent in implementing change. "Risk taking is a crucial element in change, transition and entrepreneurship. In turn, fear of risks is a key factor in resistance to change both for managers who need to decide whether or not to initiate change and for employees required to adapt to change."
(Moore and Gergen, 1985:72). Risk taking is defined as "taking action when the outcome is unknown".

Fear stifles creativity (Koberg & Bagnall, 1972:14) and risk taking behavior (Sisson, 1985). "Most of the fears that inhibit risk taking lead ultimately to a subconscious fear that people will emotionally or physically withdraw from us" (Sisson, 1985:39). Four types of fear that inhibit risk taking behavior are discussed by Byrd (cf. Sisson, 1985). They are fear of failure, fear of success, fear of what others will think and fear of uncertainty. The ultimate fear, however, that inhibits us from taking risks is a subconscious fear that others will withdraw from us emotionally or physically. Koberg and Bagnal (1972) include the following fears as blocks to creativity. Fear of:
1. mistakes
2. being foolish
3. criticized
4. being alone
5. making changes, and disturbing traditions
6. losing the security of habit
7. loss of group love
8. being an individual.

Risk taking, change and creativity are interrelated in that: "in that creativity is needed to respond successfully to change and creativity, in turn, results in change. Creativity and change both imply new directions. They are both associated with uncertainty and risk. They result in similar emotional and cultural responses (Adams 1986:3).

Anxiety and fear of failure are primarily associated with risk and change. Reitz (1987:191) includes defensiveness as an inhibitor to the creative process. Anxiety and creativity show an inverse relationship, relating an individual who is highly anxious as not being highly creative. Defensiveness, desiring to protect the ego, also inhibits creativity. Desiring to protect the ego makes it difficult to switch back and forth between unconscious mental activity (primary thinking) and conscious thinking or secondary thought processes. Creative individuals are open to risk. (Davis, 1984, 1975).

Being placed in an environment which is non-punitive allows the individual to feel safe to take risks is essential for fostering risk-taking behavior. Modeling is an important contributor as is visualization and meditation (Sisson, 1985). Other elements within the environment include acceptance of fears and mistakes and encouragement of attempts to take risks.
The preceding helps establish what Likert and Likert (1976) refer to as the "organizational climate". According to Altman, Valenzi, and Hodgetts (1985), by examining the six points presented by Likert and Likert in reference to what establishes an organizational climate, insight may be gained concerning the organization. Two main categories (overt and covert) aspects are presented in regard to describing an organizational climate. The categories are overt aspects of the organization and covert aspects. The overt aspects are readily observable whereas the covert are not as easily observable, they relate to behavioral considerations. The observable aspects include resources goals, skills, abilities, technological standards, and hierarchy. Some of the covert aspects include attitudes, feelings, values, norms, support, and interaction.

The individual is much like the organization wherein there are values that are related to more overt or covert aspects of the individual's functioning framework. By examining values, insight may be gained concerning the individual. There are what may be considered "core" attitudes or values, which are more resistant to change. Maslow viewed these "core" attitudes or values as a hierarchy of human needs. Others would include concepts such as freedom, justice, equality, or personal fulfillment, religious beliefs, economic security, and power. Each of these concepts also bears different meanings depending upon
the individual. What may be a "core" value for an individual or a segment of the population may not be regarded as such by another. This point refers to value in relation to risk taking. What is valued the most is less apt to be risked. What is valued least does not involve risk. The sense of loss does not exist.

In facilitation of change and risk, it is necessary to gain an understanding of the values/attitudes and composite values/attitudes individuals hold. When "core" values or attitudes are challenged, there is much more resistance because of the sense of loss involved. Parnes (1962:91) elaborates:

Society also encourages creativity to the extent that its value system includes a positive regard for change and novelty. And, it discourages creativity to the extent that social pressures to conformity are so intense that deviations are punished directly or indirectly through social isolation and ostracism.

A model for implementing change regarding the movement from present state into transition state to desired state was developed by Kurt Lewin (1955). The transition state was perceived as being the most difficult. According to Lewin, change takes place when an imbalance occurs between restraining forces and driving forces. This type of imbalance unfreezes the original frameworks and brings the individual out of a state of equilibrium. Within the conceptual framework, cognitive dissonance causes anxiety. The state of anxiety brought about by cognitive dissonance
may then allow the functional framework to become flexible as to consider new paradigms. Gerard (1962:10) believes that anxiety is a necessary component in discovery of solutions of problems. Conversely too much anxiety is detrimental.

Anxiety accompanies such unresolved situations. Some anxiety we normally do, and should, live with. If all anxiety were removed by Happy Pills then new solutions to problems would never come, we would stagnate and gradually disintegrate. But, conversely, too much anxiety can overwhelm the nervous system and break down needed patterns. (Gerard, 1962:10)

Edgar H. Schein (1961) elaborates on Lewin's theory, using the terms "unfreeze", "changing" and "refreezing". "Unfreeze" relates to making something in a solid state fluid, and is seen primarily in regard to self. The self resists change because of the implications regarding value associated with abandoning the old value systems. The connotation is that the old value system or belief was somehow wrong or inadequate, and would motivate the individual to resist change. "Changing", the second step, involves developing new responses based on new information. According to Schein (1961:98) cognitive redefinition is accomplished through identification and scanning.

There are two types of identification: defensive identification and positive identification. In defensive identification the individual is not voluntarily entered into the setting. Responses include fear, threat, and a
sense of helplessness. Positive identification relates to situations in which the individual has entered voluntarily. In this situation, modeling becomes important. Psychologists such as Bandura present implications for behavior change in regard to modeling behavior of others and authority figures.

Scanning involves multiple models within the environment as contrasted to identification in which focus is on a single model within the environment. In scanning the emphasis is upon the information being received, not upon the person supplying the information. Schein (1961:106) elaborates on the differences between scanning and identification. "Scanning implies attention to the content of the message, regardless of the person, whereas identification implies attention to the person regardless of the content."

The third step, "refreezing", places the individual again in a state of equilibrium. In this step new responses are integrated into the personality and a process of reconfirmation occurs.

Change involving risk moves slowly. The greater the risk, the more resistance; therefore, the likelihood of change diminishes. Referring to Schein and Lewin's concept of "freeze, thaw, refreeze", the necessity of initiating thaw becomes clear. Individuals or organizations need to be placed in an environment conducive to initiating change. As
long as frameworks are not flexible and individuals perceive and protect their "core" values in an attempt to avoid risk; confrontation not change, will be the result.

Conflict arises between individuals or groups because people are unable and unwilling to take risk. Gardner (1987:17) addresses the issue of conflict.

We are by nature a combative species. Our seemingly limitless capacity for contention has left no possible cause of dispute untested—mistrust between families, tribes, nations; economic and political differences; racial, religious and class tensions. The tribe that lives on the plains feuds with the tribe that lives in the hills.

Conflict also arises because of limited resources, differences in means to reach goals, goals themselves, and ambiguities in limited language. According to Ophuls, (1977) this society was not founded on cooperation, but competition.

Combativeness that the human species possess does not have to be viewed as a deterrent to progress. It may be used to our advantage (French, Kast, Rosenzweig, 1985). When individuals or groups are placed in situations where the sense of loss is reduced or diminished, more risks are apt to be taken and more change may occur. One method of diminishing the sense of loss (personal) and reducing fear of others withdrawing emotionally or physically is to establish a humanistic environment in which safety, security and acceptance are established.
Given a humanistic environment of mutual acceptance and trust, an individual will become free to take risks, and be involved in play and "flow experience", important within the creative process. Csikszentmihalyi (1975) relates rock climbing as an experience that motivates people to implement change through the flow experience.

**Sensation Seeking**

In the introduction of *Sensation Seeking: Beyond the Optimal Level of Arousal* (Zuckerman, 1972:7) a discussion of change relates change as a fact of life "some creatures seek change rather than merely adapting to it". Change is related to sensation seeking in that some actively seek change—novelty, risk, and exploration. The value of change or sensation seeking is seen as an advantage to the organism. An extreme of this behavior may be detrimental to survival, but for the most part sensation seeking and change increase the potential for survival.

Sensation seeking is viewed as a trait by Zuckerman (1972:7). "As with most other traits, evolution has probably produced variations about an optimal level of the trait". According to Zuckerman, et al. (1972:308), "The sensation seeker is a person who needs varied, novel, and complex sensations and experiences to maintain an optimal level of arousal".
Low-arousable individuals would generally be more creative than high-arousable individuals. Sources of arousal may be categorized as intrinsic, or trait arousal, and extrinsic. Intrinsic sources relate to individual differences in arousability. Extrinsic sources include fantasy and/or stimulation seeking.

Individuals low in arousability will seek to increase extrinsic arousal. The individual then "will be expected to seek variety, novelty, complexity, intensity and risk. This modulation of stimulation and an attempt to achieve optimal arousal levels is assumed to be significant for survival of the organism" (Farley, 1985:67). The author postulates that sensation seeking is related to creativity, stating "the need for stimulation is one of the best personality and motivational predictors of creativity" (Farley, 1985:67).

Creative individuals have lower levels of arousability and therefore seek stimulation. It may be assumed that adventure-based educational programs, emphasizing risk, uncertainty, conflict (in the form of cognitive dissonance) will increase creativity. "The seeking of novelty, variety, ambiguity and conflict—all will be expected to increase the probability of new and creative solutions to problems, of new perceptions, rejections of usual perceptions, and of achievement of unusual and original artistic and scientific perspectives" (Farley, 1985:67).
Rejection of usual perceptions may have a positive link with the ability of adventure-based education to cause a flexibility in the individual's conceptual framework, allowing change to begin or consideration of new perceptions to be reconsidered. A different view of reality may at that time be considered, whereas all information received through the senses is filtered or categorized according to the individual's functioning framework.

**Intrinsic Motivation**

The environment an individual functions from greatly influences actions, responses, and how the world is viewed. Options, creative expressions that may have been considered negatively or passed by because of our Western socialization, should now be reconsidered. It is, therefore, necessary to alter an individual's conceptual framework, moving from extrinsic to intrinsic rewards.

Intrinsic motivation appears to be a necessary component of the creative process. Adams (1986) relates intrinsic rewards to creativity, viewing a task that is challenging and fun as fostering an environment to access the creative process, as compared to motivation to fulfill needs for status, material gain, defense, etc. The environment, according to Adams (1986:140), helps implement the intrinsic motivation. Such an environment has an "atmosphere that is light on evaluation and judgement."
Amabile (1983:86) further addresses the issue of intrinsic motivation as a state essential for high levels of creativity.

Differences in creative performance are attributed to the differences, in part, of internal or external rewards as the motivational factor (Amabile, 1983:93). "Creativity can be further fostered by a clearly intrinsic motivational orientation toward work. Intrinsically satisfying aspects of the work should be emphasized in training and in working environments, and extrinsic motivations should be discouraged." (Amabile, 1983:202).

Reitz (1987:189) acknowledges the power of intrinsic rewards, but also realizes that the value of extrinsic rewards be a motivating factor. Parnes (1967:11) addresses the issue of intrinsic and extrinsic rewards.

The organization that provides for creative growth of the individual is one wherein the intrinsic satisfactions are often greater than the extrinsic rewards—for example, the sense of contributing a major portion of oneself to the job or the sense of self-expression being tangibly rewarded.

**Hemisphericity**

Western socialization processes advocate primarily left hemispheric thinking: thinking associated with the logical. Insight, metaphor and visualization are considered a right hemispheric function and while accepted by the majority of cultures, are looked upon by Western Culture
with wonder and suspicion and labeled mystical (Michaelis, 1980; Patterson, 1986; Samples, 1979). In part, this view may be attributed to the fact that unconscious thinking cannot be directly observed, but is related to creativity and change, often referred to by other labels.

One cannot talk about creative problem solving, and response to change without coming up against unconscious thinking. Although it is mysterious because it cannot be directly observed, unconscious thinking is referred to again and again as 'hunch', 'incubation', 'insight', and 'intuition'. Most accounts of creative acts refer to the appearance of concepts from somewhere other than the consciousness (the 'aha' reaction). (Adams, 1986:13)

The majority of concepts regarded as contradictions are taken into consideration by adventure based programs utilizing a metaphoric, experiential mode of education (Bacon, 1983). Synectics, used for promoting creativity and problem solving includes in its process of "making the strange familiar and the familiar strange" (Gordon, 1961) which may be considered a holistic approach to creativity and problem solving. The concept of making the strange familiar relates to the analytical phase of problem solving by understanding the problem presented. The second phase of the process relates to the right hemispheric function and includes use of fantasy and play to "generate energy for problem solving and to evoke new viewpoints with respect to problems" (Gordon, 1961:119). Within organizations, according to Miller (1985), a company should nurture whole brain thinking and not dismiss innovative ideas that may
appear on the surface to be somewhat strange, but pay attention to them.

Maslow (1968:14) refers to an integrated mode of thought as "integrated creativity". Creativity and problem solving, current research suggests, is an integration of both hemispheres, a holistic or integrated mode of processing (Torrance and Mourad, 1979:44). It is in this type of problem solving or thought process the individual is utilizing the right hemisphere, or both hemispheres, not primarily the left hemisphere of the brain.

However, superior adults having a style of information processing associated with right cerebral hemisphere functions and those having integrated style of information processing appeared to be generally more effective than those with a left style and to have the motivations and personality characteristics usually associated with creative achievement (Torrance and Mourad, 1979:53)

Within the experience of the flow phenomenon or peak experience, commonalities may be found that parallel the affective processes within the creative process. Research indicates traits of creative individuals include males score higher in traits associated with femininity and females score higher in traits associated with males (Roe, 1976; Hammer, 1984). Conflict has also been suggested. Jung (1964) suggests the concept of the anima and animus (contrasting components of male and female) are present in every individual. The integration of male and female components is referred to as androgynous. Sanford (1980:6)
addresses the concept of androgynous nature in relation to C.G. Jung.

So this idea of man's androgynous nature is an old one that has often been expressed in mythology and by the great intuitive spirits of times past. In our century, C.G. Jung is the first scientist to observe this psychological fact of human nature, and to take it into account in describing the whole human being. (Sanford, 1980:6)

The author continues in suggesting that the terms male and female are means of addressing psychic energy and reminds the reader that in the ancient Chinese yin and yang are used in relation to the masculine and feminine, with yang representing the masculine and yin the feminine. These also "... represent the two spiritual poles along which all life flows" (Sanford, 1980:8).

Utilizing projective types of instruments, (Rorschach and Thematic Apperception Test, TAT) Hammer (1984:90) found: "In the TAT's of the 'creative subjects', intrapsychic conflicts replace the more superficial interpsychic conflicts projected by the 'merely facile'. The 'creative' offered TAT stories in which the protagonist engages in a struggle more with himself than with others." Highly creative individuals experience internal conflict whereas external conflict is more apparently present in those who are not as creative. Looking at hemisphericity (right and left hemispheric functions) it has been suggested that creativity is an integration of both hemispheres.
(Torrance and Mourad, 1979; Sanders and Sanders, 1984; Young, 1985). Perhaps this integration of the hemispheres relates to the Jungian concept of the feminine and masculine.

Ideas are sometimes referred to as an "intuitive leap" (Blakeslee, 1980). The author directs our attention to the applicability of intuition even in such areas as science and mathematics. Young, (1985:77) also addresses the concept of holistic thinking and views creativity as a "paradoxical integration of doing and being" and is regarded as an integration of our logical left hemisphere with the intuitive right hemisphere of the brain, drawing upon divergent thinking and converging upon a solution to the problem.

Shaw and DeMers (1986), in their discussion of creative thinking, consider the importance of imagery, a right hemispheric function, relating its link to the flow of creative thinking. Imagery is also seen as the link between differences in individuals pertaining to transforming information in the creative processes incubation stage. Sanders and Sanders (1984:24) regard metaphor as an intricate part of fostering creativity. Through the use of metaphor and metaphoric education "concept attainment becomes a mutually interactive experience, a product of both the left and right hemispheres". The issue of the right brain and left brain model is criticized as being overly simplistic by Reitz (1987) and the author advocates the
process be viewed as primary process thinking and secondary process thinking.

Primary process thinking tends to be highly emotional, symbolic, and characterized by loose associations and illogical forms of reasoning. Psychoanalytical theory says that the primary process thinking is unconscious, impulsive and more primitive than secondary processes. Secondary process thinking, on the other hand, relies on a conceptual organization of the memory. It is also carried out consciously. Secondary process thinking is directed toward the environment and its mastery. Primary process thinking, in contrast is ego centered. (Reitz, 1987:187)

Creative processes require a blend of both the unconscious primary thinking, and the secondary process provides the problem or goal relating it to experimentation and applying the primary process.

"Man's capacity to imagine, visualize, respond simultaneously to all sensory stimuli, and to use intuition to solve problems have all too rarely been considered or measured in education. Yet hemispheric research indicates, these abilities are of prime importance to living healthful, productive lives" (Staley, 1979:9). Hemispheric research (Sperry) has established that functions involving analytical, linear-sequential processes, for example, are associated with the left hemisphere of the brain; whereas sensory stimulation, holistic perceptions, (processing many kinds of information at once) and metaphor are associated with the right hemisphere. Experiential learning and metaphoric education (Bacon, 1983) are holistic in the
respect that an individual is integrating the use of his/her senses while acquiring new concepts and skills. Adventure based programs use experiential, metaphoric education with an emphasis on affective learning experiences, and have as their focus an individual's social and emotional growth. Experiential learning involves "whole-brain" activities, while metaphoric education is primarily a function of the right hemisphere. These concepts are holistic in their approach to learning; holistic in the context individuals are integrating the use of their senses while acquiring skills and concepts, within a natural environment, using stress, group support and encouragement of self-examination. Problem solving is the basic teaching style (Meier, Morash & Welton, 1980) presented within the experiential, metaphoric mode. By altering an individual's conceptual framework, moving from extrinsic to intrinsic rewards through adventure based programs, an individual's level of creativity may be enhanced or promoted.

Such programs have been designed and implemented for corporations "to foster executive team-building". Organizations such as Eastman Kodak, General Motors, Johnson Wax, Rolls Royce, and AT&T have sent their employees to Outward Bound courses, reporting employees returned with positive traits such as "more self-assured, better morale, enhanced sense of team-work" and the majority felt they were able to handle stress and interact with co-workers in a more
positive way (76%) and eighty-eight percent felt job responsibilities were handled better as a result of the experience (Willis, 1985:18).

The environment greatly influences actions, responses and how the world is viewed. Options, creative expressions that may have been considered negatively, or passed by because of Western socialization should now be reconsidered. "Managers who provide their employees with support and who tolerate risk taking and occasional failure provide the kind of climate in which high levels of creativity and innovation can be developed. Creative behavior deals in uncertainty, which requires support and communications at the interpersonal level" (Reitz, 1987:193). Risk taking and support of individuals are important factors in the fostering of the creative potential. Creative behavior is affected by an organization's established environment. Creative behavior is also viewed as an interaction between the individual and the environment, therefore the environment established can either "aid or impede creative and innovative expression through the environments they create for their members" (Reitz, 1987:194).

It is, therefore, necessary to alter an individual's conceptual framework, moving from extrinsic to intrinsic rewards. Correlating concepts pertaining to creativity, appear throughout the literature. Csikszentmihalyi (1975) states "...play is the flow experience par excellence".
Michaelis (1980) suggests that for actualization or mental health, there is an interrelatedness between fantasy, make believe, play and flow. The concepts associated with play, creativity, affective modes and flow need to be fostered within an environment that accepts and considers the importance of right hemispheric thinking in relation to an individual's personal growth. With the goal presented as reaching toward self-actualization, the environment necessary to achieve this goal is one of a humanistic nature. "Man's capacity to imagine, visualize, respond simultaneously to all sensory stimuli, and to use intuition to solve problems have all too rarely been considered or measured in education. Yet, hemispheric research indicates, these abilities are of prime importance to living healthful, productive lives" (Staley, 1979:9).

Senses

Guilford (1977:22) relates information acquisition to "four major categories: figural (perceived through the senses), symbolic (signs or tokens), semantic (thoughts), and behavioral (mental states). According to Adams (1986:39-40) in problem solving the information we obtain comes to us through our senses and is effected by cultural and emotional factors. Each individual may respond differently to sensory input because of the filter, the conceptual framework. Our senses are limited, therefore our
reality is also limited. "One of our most common errors is to assume that our model of the world is reality. It is our personal reality, but it does not necessarily correspond to nature" (Adams, 1986:39). No two individual's models are the same. "...that person's brain is filled with different information and procedures, but his or her sensors differ from yours in sensitivity" (Adams, 1986:39). Problem solving information that is incomplete comes to us from our senses, filtering information which is pertinent to us. Jung, (cf Campbell, 1971:25) in regard to consciousness states: "Consciousness seems to stream into us from the outside in the form of sense-perceptions. We see, hear, taste and smell the world. Sense perceptions tell us something is, but they do not tell us what it is." He continues to explain that "what something is" comes to us through the process of apperception, which is psychic as compared to "sense-perception" which is primarily physiological. Psychic processes include the process of recognition which is referred to as thinking, and the process of evaluation which causes emotional responses based upon "memory-images". Jung refers to the emotional responses as "feeling tones". The intuitive process is neither sense-perception, thinking, or feeling. Intuition then is "...one of the basic functions of the psyche, namely, perception of the possibilities inherent in a situation" (Jung, cf. Campbell, 1971:26).
By expanding upon Jung’s components, the implication of an individual’s perception of the world (reality) becomes clear. Each event, object, or experience is brought through the senses, distorting or being individualized by the conceptual framework. Not only do we function from limited information coming to us through our senses, but our senses also bias problem solving, because of our biases in information. Upton, Samson and Farmer (1961, 1978) believe that metaphor, in the context of the analysis through the prominence factors relating to sensory and affective modes, influence creativity scores.

Adams (1984:40) groups the senses into the following categories:

1. **vision**
   - sight

2. **hearing**
   - sound

3. **movement**
   - vestibular (orientation)
   - kinesthetic (body configuration)

4. **skin**
   - hot, cold, pressure, pain

5. **chemical**
   - taste, smell

6. **organic**
   - state of body (hunger, sexual satiation, etc.)

7. **time**
   - passage of time

The organic senses and time senses, while involved in problem solving, are viewed as more "mysterious" (Adams,
1984:50). Feelings fall under the category of organic and according to Adams, "send signals of impending success, unacceptable risk, and even unacceptable mediocrity". The reader's attention is then directed to the concept of time, dividing it into clock and psychological. Psychological time, in relation to problem solving, "is responsible for the apparently leisurely phase at the beginning and the mad race at the end" (Adams, 1984:51).

Authors such as Csikszentmihalyi (1975) and Patterson (1985) report individuals involved in the creative process, or the "flow" experience a distortion in time/space. Csikszentmihalyi (1975:87) reports "Strongly correlated with the merging of action and awareness is an altered time sense, a distortion in the congruence of chronological and psychological time". Patterson (1985:105) also found creative individuals report a distortion in time. "Creative people have an ability to visualize, are able to relax or just let go, report a distortion of time/space plus a heightened awareness of sensory stimuli, possess a playful and curious frame of mind, see relationships or think metaphorically."

In this respect, the importance of the effect of the conceptual framework or image may be seen. The conceptual framework may limit our responses, choices, and the process we use in problem solving. The boundaries of the image or conceptual framework need to be made flexible or permeable,
a trait creative individuals possess. Stein (1962:87) addresses the permeability of the self in relation to creative individuals.

The creative individual possesses permeable boundaries between the regions within the self. This permeability is related to his capacity for developing a series of hypotheses for future testing. Just as there needs to be communication between the individual and the environment to initiate the creative process so there needs to be communication between the inner personal regions if the creative process is to be continued. (Stein, 1962:87)

Blocks and Inhibitors

Willing (1986:10) relates blocks or inhibitors to the creative process stemming in part from the educational and organizational systems. According to the author, schools and universities foster "bottom line thinking". "It closes the mind to the unusual, the ramifications and permutations of a problem or aspects of it." Getting in touch with the absurd is a component of creativity and may be viewed as Gordon (1961:34) states: "making the strange familiar" and "the familiar strange." Making the familiar strange "is to distort, invert, transpose, the everyday ways of looking and responding which render the world a secure familiar place." "It is a conscious attempt to: achieve a new look at the same old world, people, ideas, feelings."

Students at universities are indoctrinated toward "locking out the absurd", accepting material that is only viewed as relevant to the field at hand; not integrating
other disciplines to synthesize information. According to Willings (1986:15): "Closely allied to the tyranny of relevance is 'more of the same'". "More of the same" refers to not considering the alternative possibilities in problem solving, focusing on one outcome or expectation and considering other outcomes or information as irrelevant when perhaps, the solution lies within the "irrelevant".

Labeling is also seen as an inhibitor of creative thinking within organizations. An individual is expected to behave in a manner associated with the position. "The lawyer must stick to law and behave like a lawyer. The computer expert must stick to computers and behave like a computer expert" (Willings 1986:15). Children within the educational system are also subjected to labeling. The labeling may be from one in an authority position or from self. Moustakas (1969:4) refers to "alienation" which is defined as: "choosing a life outlined and determined by others instead of one based on inner experience". Alienation is seen within the school system as a sign of adjustment, whereas individuality creates an adversarial relationship for teachers and students.
The teaching of lessons is geared toward the group, not the individual. Moustakas (1969:4) elaborates:

The alienated person is anesthetic; he is embedded in a world without color, without excitement, without risk and danger, without mystery—in a world without meaning. It is only one step from here to self-abnegation, where the person, without awareness, renounces himself and takes on the pattern of the authority, he conforms to the parent, the friend, the teacher, the wife or husband, to the boss, the middle class society; and he learns to play the role with increasing complexity and skill.

In the school environment, play is considered unimportant and the only valuable knowledge is acquired through professionals (Lord, Hutchinson, VanDerveck, 1980). The authors further see a fragmentation, a separation between work and play. Play is no longer being seen as a time for exploration, discovery and learning, which are also components of the creative process. Michaelis (1980) views reluctance to play, sensory dullness, impoverished fantasy life, impoverished emotional life and reluctance to ‘let go’ as blocks to a creative life style.

Arnold, (cf. Farnes and Harding 1962:130) list three categories of blocks to creative thinking. Perceptual—which includes blocks or inhibitors that prevent an individual from getting an adequate, true, relevant picture of the world. This relates to the structure of the conceptual framework, in which information or stimuli is brought through the senses and filtered by the conceptual framework—the world-view. The second category, cultural,
relates to society's pressure on the individual to conform; to put away the child, the play and fantasy, which are necessary components of creativity, is stressed by society. The final category, emotional, relates to our fears, anxieties and fear of failure.

Perhaps, removing the biases, prejudices and misconceptions, relates to the childlike qualities of play. Play, being primarily a right hemispheric function, fosters an internal environment necessary for creativity. Bishop and Jeanrenaud (1980:88,90) regard blocks to creativity as beginning in forms of control, from parents, friends or relatives, called tutors. Control may be either direct or indirect. Direct control from tutors is in the form of reinforcement, rewards, or punishment. Indirectly, control is asserted through manipulation of the environment. This type of manipulation may be in the form of overdirectiveness, or underdirectiveness. Moderate directiveness provides the environment necessary to foster creativity. In overdirectiveness, the individual has not had the opportunity to be curious and explore. Within Wallas' (1926) model, this relates to the stage of preparation in which information is gathered. Unnecessary assistance from the tutor will also retard the exploration or curious stage by not allowing the individual to take responsibility and experience errors. We also learn by our errors, another procedure in the information gathering
process. Underdirectiveness occurs when no control is exercised. Moderate directiveness most likely leads to creativity. In this environment, the learner proceeds through a series of experiences structured to the discovery of responses which ultimately lead to a successful experience, and information gathering.

Ivancevich and Matteson (1987:85) consider all work and no play will "dampen creativity". This relates to the stage of illumination when the individual must consciously let go of the task at hand, giving time for unconscious processes to be engaged. In this respect one of the advantages of play may be seen.

Play and Fantasy

According to Michaelis (1980), there is an interconnection between the concepts of creativity, play, fantasy and the flow phenomenon. Authors such as Patterson, (1985); Bishop and Jeanrenaud, (1980); Sanders and Sanders (1984); and Kraus (1984) also regard a relationship between play and creativity. This relationship is manifested in the view that play is "not so much an activity as a form of behavior" (Kraus, 1984:48) having a direct relationship to problem solving. This is attributed to the "flexible and relatively unconstrained nature of play behavior" (Smith and Simon 1984:199). Traits of creative individuals include "playful, childlike (Davis 1983:25) an ability to play with
ideas (Rogers, 161:354). Kraus (1984:32) notes from a psychological perspective, the contemporary view of play emphasizes creative expression. A function of play as viewed by Pepler (1982:199) "is enhancement of problem solving skills and the kind of innovative behavior which often helps solve problems".

The relationship of play to creative expression is also found in the concept that play is related to divergent thinking ability (Pepler 1982:200), and primarily a right hemispheric function; as is fantasy, metaphor and creativity. Michaelis (1980:64-65) elaborates in his discussion of blocks to creativity:

Further evidence linking the right brain elements of play to creativity come from systematic research and the identification of blocks to creative lifestyles. Psychologists identify some of the main blocks to creativity as: (1) the reluctance to play, (2) sensory dullness, (3) impoverished fantasy life, (4) the reluctance to 'let go' and (5) impoverished emotional life.

According to Bishop and Jeanrenaud (1980:87) play can either inhibit or foster creativity. Play, viewed as exploratory behavior, may become too directed and too structured, thus restricting the necessary component of exploration. The authors present two conditions necessary for creativity to occur: exploratory-play experiences and assimilation-play experiences. Within exploratory-play the individual explores potential responses to his/her
environment, thus increasing the number of potential responses for future problem solving. "In short exploratory-play, by providing many potential responses, helps make the person potentially creative" (Bishop and Jeanrenaud, 1980:87).

Motivation is also considered as being increased through exploratory-play. Assimilation-play, the second component, helps to develop skills through transformation and repetition. In this type of play, the individual is perfecting a skill or his understanding of a task or situation.

The author's model of play in relation to creativity, consists of: the attention stage, novelty, curiosity, exploratory play, and assimilation. In many ways this resembles the creative process which, in a model postulated by Jurik (1972:17), is a combination of Wallas (1926) and Torrance (1962) models. It consists of the following stages: sensing the problem, preparation, incubation, illumination and verification. The attention stage would be comparable to the sensing the problem stage in which the individual becomes aware of the problem, or clarification of the problem, and random exploration. Attention has to be gained in relation to a particular object or situation for learning (thus creativity) to occur. In order to gain the individual's attention the construct of novelty must exist. Intensity relates to novelty in the extent that the object
or situation stands apart from the rest of the environment.

Novelty, intensity and curiosity are related to attention also in the context of approach-avoidance conflict that must be resolved. Novelty and intensity emit a response of approach (either physical or psychological) or in relation to the intensity of the factors, resulting in an inverted U relationship. In preparation, many possible solutions are explored, such as in exploratory-play. Novelty and curiosity are also part of exploratory-play, placing the individual in an approach-avoidance situation depending upon the intensity of the stimuli. Assimilation represents a combination of the incubation and illumination processes, within the creative process. Verification, which within the creative process is the time when ideas are tested, is similar to the assimilation stage of play. Assimilation "is the repetition of behavior or situations, which, during the exploratory stage, appear challenging or were reinforced; such repetition permits the child to assimilate or master the behavior or situation" (Bishop, and Jeanrenaud, 1996:86).

When children play, the techniques associated with creativity are employed. Play includes adventure, challenge, and activities are explored with imagination. Play also includes flexibility, change, spontaneity, fantasy and feeling.

As children we had tremendous potential creativity within us and exercised it because in a very existential way we knew what play was all about. We had adventures, challenged ourselves, played made-up games with made-up rules, explored new areas of the world in our heads and in activities. We knew what play was about because it included such elements as flexibility, change and spontaneity. Fantasies were allowed and feelings were exercised.

The concepts associated with play, creativity, fantasy, affective modes and flow need to be fostered within an environment that accepts and considers the importance of right hemispheric thinking in relation to an individual's personal growth. With the goal presented as reaching toward self-actualization, the environment necessary to achieve this goal is one of a humanistic nature.

Man's capacity to imagine, visualize, respond simultaneously to all sensory stimuli, and to use intuition to solve problems have all too rarely been considered or measured in education. Yet, hemispheric research indicates, these abilities are of prime importance to living healthful, productive lives. (Staley, 1979:9).

The environment must provide an opportunity for the individual to experience challenge, risk, fantasy and yet be accepting and perceived as safe. What is considered a holistic approach containing experiential modes of learning, wherein individuals may be free to explore, create, discover and test new ideas within an environment of acceptance is the starting point of a re-socialization process.
The educational situation that most effectively promotes significant learning is one in which (a) the external threats to the self of the learner, such as rejection, criticism, evaluation, reward, and punishment are at a minimum, while, at the same time the individuality and uniqueness of the person are valued, respected, and trusted; and (b) the person is free to explore the materials and resources that are available to him in the light of his own interests, potentialities and readiness. (Moustakas, 1969:24)

The second factor (b) in establishing an environment of receptiveness refers to an internal quietness. This may be considered within what Von Oech (1986) calls "listening to the 'gut'" and "intuition", some of the components of the creative process. Wallas (1926) uses the terms "illumination" and "incubation". This stage represents a letting go and being receptive to ideas or flashes of insight that may occur.

**Metaphor**

Metaphor or metaphoristic education according to Sanders and Sanders (1984:4) teaches individuals to "link concepts and imagination it expresses thoughts otherwise unexpressed." The authors continue in regard to the value of metaphorical education. "Metaphoric thought provides an understanding of concepts not possible in the more passive activities of reading or writing. Indeed, metaphors are tools for insight, for creativity, for concept development, for learning, for true understanding."
Davis (1986:14) states the value of metaphorical thinking in relation to creativity:

One cannot overstate the importance of metaphorical thinking in creativity. It is simply and absolutely true that many, perhaps the large majority of our creative ideas and problem solutions are born in metaphorical thinking. When we think metaphorically we take ideas from one context and use them in a new context, producing the new idea combination that is creativity.

Davis (1986:14) also cites William J.J. Gordon's work as utilizing metaphorical thinking. Gordon's (1961) synectics theory uses four types of metaphor in the process of making the strange familiar. Personal analogy demands loss of self. Fear of loss of control is also a factor. Direct analogy describes the actual comparison of parallel facts, knowledge, and technology. Symbolic analogy uses of objective and impersonal images to describe the problem. Fantasy Analogy is to allow fantasy in solutions. Examples of the use of metaphorical thinking in various disciplines are recorded by Davis (1986). Examples include musicians such as Tchaikovsky and Beethoven, scientists and inventors such as Pasteur and James Watt; in literature, William Shakespeare is said to have used metaphorical thinking.

Affective insight and utilization of both hemispheres (integrated brain approach) is also an effect of metaphoric education. Concept formation becomes an interactive process when metaphor is used. The right hemisphere draws upon life
experiences to create concept understanding, while the left hemisphere uses the analytical process (Sanders and Sanders 1984:17).

Patterson (1985:105) reports that "creative individuals are able to see relationships or think metaphorically". Cagle (1985:104) hypothesizes that creativity is "a process of abstracting and concertizing". This position holds that the creative process consists of three dimensions of thought operating within an abstract and a concrete domain.

The conceptual frameworks help to form the foundations by which an individual decodes the metaphor, and should be considered as a factor regarding the effectiveness of metaphoric and experiential education. The value of metaphor relates to an individual's perception of reality. Each experience being decoded finds a common experience within the functioning framework to relate to through metaphor. The effectiveness of learning relates then to the uniqueness of the learner. Moustakas (1969:20) addresses this topic:

\begin{quote}
No resource will be experienced in the same way by two people; it has no exclusively objective value, but if it is real, if it is genuine, it can initiate a process of experience in the learner; the experience itself will be personal, subjective, and dependent upon the particular uniqueness of the learner.
\end{quote}

The link becomes the metaphor, allowing each individual to utilize the individualized perception of reality. By
synthesizing the concepts presented in literature, the importance of external forces may be noted.

Hawkins (1985:253) regards the influence of external forces as:

...the nature of the individual's current local environment, emotional experiences, family traditions, racial and national culture, religious beliefs, the formal acquisition of knowledge, literature, art, music, historical association, myth and legend, geographical perspectives, science, politics, and outdoor experience.

The uniqueness of the learner in combination with the external forces which help comprise the environment greatly influences how concepts are linked.

Creativity is a multi-faceted concept. Components that have been suggested as contributing to creativity include, play, fantasy, metaphor, risk and change. The theoretic model presents a link between the optimal level of arousal and motivation. Sensation seeking in its four factors is a result of the need to obtain an optimal level of arousal. Risk, change and play as exploration interact leading to self-actualization, seeking knowledge, utilizing curiosity and exploration. With self-actualization the individual may be engaged at times in flow. Blocks and inhibitors to creativity may be recognized and responded to through the socialization processes primarily within the educational system. As an understanding develops concerning the facets and their interaction, insight may be gained into the
creative person and the creative process.
CHAPTER III

Research Design

This research is a mixed purpose study with two dimensions. The first dimension sought to answer the question: Do college students who take part in adventure education programs have a greater propensity toward creativity than college students who choose not to take part in adventure programs? The following null hypothesis is presented to address the first dimension.

1. Ho: There is no significant difference between the scores on a test of creativity of individuals who take part in an adventure experience and those who choose not to take part in such an activity.

The second dimension sought to answer the questions: Do individuals involved in adventure experiences reflect traits of risk taking and/or sensation seeking, and: Does propensity for sensation seeking increase after adventure experiences?

The following null hypotheses are presented to address this second dimension.
1. Ho2. Pretest scores between the treatment and control group do not significantly vary on each of the four study factors. (i.e. Pre-test $O_1$ & $O_3$). See Figure 4.

2. Ho3. Post-test scores between the two treatment groups do not significantly vary on each of the four study factors (i.e. Post-test $O_2$ & $O_3$). See Figure 4.

3. Ho4. Post-test scores between the two control groups do not significantly vary of the four factors. (i.e. Post test $O_4$ compared to Post-test $O_5$). See Figure 4.

4. Ho5. There is no significant difference between the control group's post test scores and the treatment group's post test scores (i.e. $O_4$ & $O_6$ and $O_2$ & $O_3$). See Figure 4.

5. Ho6. There is no significant difference between pre-test and post-test scores of the experimental group compared to the control group's post test scores.

The Solomon Four-Group Design as described by Campbell and Stanley (1963) was determined to be the appropriate design for assessing dimension two. The design is shown in Figure 4.

<table>
<thead>
<tr>
<th>Group</th>
<th>Pre-test</th>
<th>Treatment</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>$R_1$</td>
<td>$O_1$</td>
<td>X</td>
<td>$O_2$</td>
</tr>
<tr>
<td>$R_2$</td>
<td>$O_3$</td>
<td></td>
<td>$O_4$</td>
</tr>
<tr>
<td>$R_3$</td>
<td></td>
<td>X</td>
<td>$O_5$</td>
</tr>
<tr>
<td>$R_4$</td>
<td></td>
<td></td>
<td>$O_6$</td>
</tr>
</tbody>
</table>

FIGURE 4

Representation of Solomon Four-Group Design (Campbell and Stanley, 1963)
The four groups are numbered R1-4; O1,3 are equal to the two pre tests; X is equal to treatment; and O2,4,5,6 are equal to post-test. This design was chosen primarily for its ability to control extraneous factors, i.e. history, maturation, effects of pre-testing, and regression (Campbell and Stanley, 1963).

Subject Selection

The study sample population consisted of students enrolled at The Ohio State University (O.S.U.) during Autumn Quarter, 1988. Group R1 and R3 consisted of students enrolled in the O.S.U. Programs of Outdoor Pursuits. The participants were therefore self selected. Activities in the programs are: High Ropes Course, Canoeing I, Rockclimbing I, Backpacking I, and Caving I.

The control groups R2 and R4 were drawn from a randomized selection of students enrolled at the University Autumn Quarter not taking part in or expressing a desire to take part in a program of outdoor pursuits. Students were selected using a random number table with replacement from the O.S.U. Student Directory. Groups R2 and R4, the control group, are described in Table 13 Appendix E.

Groups R1 and R3, the treatment group, are described in Table 14 in Appendix F. From the treatment group of 78 Sensation Seeking instruments that were administered, 52
were usable. Of the 79 instruments for assessing creativity that were collected, 69 were usable. Such factors as having dropped the class, refusal to participate or improperly completed forms eliminated some of the subjects from the study.

Instrumentation

Two instruments were chosen, How Do You Think, Form E, (Davis, 1977) (Appendix A) and Sensation Seeking Scale V (Zuckerman, 1979) (Appendix B) to investigate the research questions. The Sensation Seeking Scale Form V designed by Zuckerman (1979) was chosen to measure propensity toward sensation seeking. This instrument consists of four factors: Thrill and Adventure Seeking, Experience Seeking, Disinhibition and Boredom Susceptibility. Each factor contains 10 items, for a total of 40 questions. The internal reliability was reported as ranging from 0.83 to 0.86 (Zuckerman, 1979:111).

The How Do You Think Form E was selected to investigate the question: Do individuals involved in adventure experiences have a greater propensity toward creativity than those who choose not to participate? This question addresses the first dimension of the study.

According to the author, How Do You Think Form E is superior to an earlier but similar instrument, Form B (Davis, 1988). Form E consists of 100 questions, with questions 37 and 99 of Form B having been deleted. The How
Do You Think Form B is a 102 item inventory which measures a predisposition to behave creatively. The Hoyt reliability of the How Do You Think Form B was reported as .94 (n=68) (Davis, 1974). The instrument was shown to exhibit predictive validity through an operational criterion of creativity. The operational criterion was established by a panel of judges who placed values on: 1. art or handicraft project 2. creative writing 3. ideas for two inventions 4. creative teaching strategy ideas.

In a study by Bartlett and Davis (cf. Davis and Subkoviak, 1974), n=37, a correlation between test scores and creativity rating was reported as r=.42 (p.<.01) with an interrater reliability of .78.

Conditions of Testing

The instruments for Groups R1 and R2, the treatment, (See Figure 4) were administered at the first class meeting of each of the four OSU Outdoor Pursuit classes in Autumn Quarter, 1988. The researcher was introduced by the instructor. The importance of the research was explained and the project was presented as an environmental education research project. However, no mention was made of creativity or sensation seeking, so as not to bias the participants. That the scores were assessed as a group and results would be made available after March, 1989 by contacting the researcher. All subjects were informed that
participation was voluntary and confidential, and would in no way affect the grades in the course. Oral instructions were given such as: Please complete all questions. There are no right or wrong answers. If both choices describe what you prefer or how you feel, choose the one which better describes your preferences or feelings. If neither choice is one you like, mark the choice you dislike least.

For the How Do You Think Form E, additional instructions were given to mark the degree to which the participant agreed or disagreed with the statement. The instructions were also printed on the instrument (See Appendix A). The post-test, Sensation Seeking V, (See Appendix B) was administered with the same instructions at the final class meeting. The classes generally met at 6:00, 7:00, or 8:00 P.M.

Control Group

Subjects selected from a preliminary random sample were asked through phone conversation if they had participated in, or would desire to participate in such activities as high ropes, canoeing, rockclimbing, caving or a backpacking trip of 3 or more days. Those responding positively to the query were eliminated from the study. Those responding negatively to the query were then asked if they would take part in the study. Of those agreeing a random sample was drawn and selected to comprise Group R2 or
Group R₄ (See Figure 4). This means that the effects of
the study can be generalized only to volunteers. On January
8, 1989 a letter acknowledging the agreement to participate
in the study and a copy of the instrument were mailed (See
Appendix C). Group R₄ received both the How Do You Think
Form E and Sensation Seeking Scale V. Those subjects in
group R₃ received only the How Do You Think Form E in
January, 1989. Both groups, after a period of one week,
received the post test. Sensation Seeking Scale V.

Non-respondents were sent a second mailing on January
21, 1989. (See Appendix D). Groups R₁ and R₅, the
experimental groups, and Groups R₂ and R₄, the control
groups, were then matched through random selection to have
an equal number of participants in each group.
Questionnaires were coded with PP followed by a number to
represent the pre-post test group (R₂). The post test (R₄)
group was represented by the code PO also followed by a
number. For the How Do You Think Form E 100 questionnaires
were sent. Of those questionnaires sent to the control
group 60 responses were useable. Of the 79 questionnaires
in the experimental group, 69 responses were useable.

Treatments

The treatments consisted of one of two backpacking
trips, one of two caving trips, or a canoeing trip, or a
high ropes course. The two backpacking activities took
place at Zaleski backpack trail in south eastern Ohio. The
experience lasted for two days and one night. There were two trips, October 7-9, 1988 and November 11-13, 1988.

There were two class meetings. The instructor stressed the meaning of an adventure experience and its relationship to the activity. Each participant introduced his/her self and stated why they chose to take part in the activity. Mention was made to the effect of each individual working as part of a smaller group in terms of responsibility and cooperation with the group. Equipment and maps were distributed.

The caving experiences took place as exploration of wild cave systems at Carter Caves State Park in northern Kentucky. There were also two caving trips, October 29-30, 1988 and November 11-13, 1988. Instructional time consisted of two-hour instructional classes prior to the trip. At the first meeting the instructor stressed the meaning of an adventure experience. A debriefing session followed the trip. Within the instructional meetings, emphasis was placed on what constitutes an adventure. Each member of the group spoke regarding why they chose to take part in the experience and gave a brief biographical sketch. Assignments were made regarding presentations on cave etiquette, cave formation, equipment, history, and ecosystems of caves. After most of the activities there was a debriefing session in which the instructors (who are graduate students at The Ohio State University) talked with
the participants concerning the experience in relation to feelings, positive experiences and reactions to each other in stressful situations.

The canoeing trip took place on the Grand River, October 21-23, 1988. This course is described as designed to introduce students to flatwater canoeing techniques and canoe camping. Students will learn canoe design, basic paddling skills, portaging skills, and campcraft pertinent to canoe camping. There were three class instructional meetings and a debriefing session after the trip.

The rockclimbing activities took place at Clifton Gorge, Ohio on October 8-9 and October 22-23, 1988. This course is described as being designed to instruct students in developing a safety awareness and understanding of top rope climbing system. Climbing skills, belay technique, knot tying, and safety concerns will be covered. There was an orientation meeting with two practice sessions on the climbing wall at The Ohio State University, Larkins Hall before the trip to Clifton Gorge.

The ropes course is located at Camp Mary Orton in Worthington, Ohio. There are two Rope Courses, 25' and 40' above ground. After most of the activities there was a debriefing session in which the instructors of The Ohio State University classes participating in the study talked with the participants concerning the experience in relation
to feelings, positive experiences and reactions to each
other in stressful situations.

**Data Analysis**

The usable responses were numbered with subject number
on the top left corner. Age, gender, major, group and test
type (pre or post) were recorded on each form. Through this
method, subjects could be grouped into R₁, R₂, R₃, or R₄.
The Davis *How Do You Think* Form E was scored according to
the scoring guide with a total of 500 points maximum. Each
response, A, B, C, D, E represents a numerical value such as
A=1, B=2, C=3, D=4, E=5. Questions 3, 10, 14, 20, 23, 38,
39, 41, 44, 49, 63, 64, 66, 69, 77, 78, and 92 being
negatively scored with A=5, B=4, C=3, D=2, and E=1. The
instruments were hand scored and tallied. The total score
was recorded at the top of each form and entered in the data
collection sheet.

The Sensation Seeking Scale V is scored on a maximum
of 40 points for a total sensation seeking score. Each
question is scored as correct or incorrect. Questions are
divided into each of the four factors of sensation seeking
with a maximum of 10 points, one per item, in each sensation
seeking factor to generate a total sensation seeking score
of 40. Questions relating to TA are: 3, 11, 16, 17, 20, 21,
23, 28, 38, 40. Questions relating to ES are: 4, 6, 9, 14,
18, 19, 22, 26, 37. Questions relating to DIS are: 1, 12,
13, 25, 29, 30, 32, 33, 35, 36. Questions relating to BS are: 2, 5, 7, 8, 15, 24, 27, 31, 34, 39.

Data collected from How Do You Think Form E was analyzed using mean, standard deviation and t-test. This inferential statistic was employed to see if there was any statistical difference between the propensity toward creativity scores of those selecting to participate in adventure education programs and those having no desire to participate in such programs. Alpha level was set at .05.

Data from the Sensation Seeking Scale Form V which produces five scores, one each for Thrill and Adventure Seeking (TAS), Experience Seeking (ES), Disinhibition (DIS), and Boredom Susceptibility (BS) and a total Sensation Seeking score, will be analyzed using five MANOVA, one for each score of the four factors and one for the total score relating to sensation seeking. An alpha level of .05 was set. There are two levels of the independent variable, participation and non-participation in adventure experiences. The dependent variable consists of the four scores on the Sensation Seeking Scale Form V, and the composite score of the four factors. The four factors consist of: 1. Thrill and Adventure Seeking; 2. Experience Seeking; 3. Disinhibition; 4. Boredom Susceptibility.
CHAPTER IV

RESULTS

In this chapter results of the data analysis are reported first in a descriptive fashion and second in terms of statistical analysis. Analysis of the data acquired from How Do You Think Form E (Davis, 1977) was analyzed using the Mystat program and data acquired from Sensation Seeking Scale V (Zuckerman, 1979) was analyzed using Systat.

This study was a mixed purpose study with two dimensions. The first dimension was to answer the question: Are college students who take part in adventure education programs more creative than college students who choose not to take part in adventure programs. The primary nature of this dimension is descriptive, therefore mean, and standard deviation were used as statistical procedures. A t-test was also used to establish if the groups were similar or different. The following hypothesis was presented to answer this question:

1. Ho, There is no significant difference between the scores on a test of creativity of individuals who desire to take part in an adventure experience and those who choose not to take part in such an activity.
The second dimension of the study used a Solomon Four-Group Design to answer the following questions: Do individuals involved in adventure experiences reflect traits of risk taking and/or sensation seeking, and, Does propensity for sensation seeking increase after adventure experiences?

1. $H_{02}$ Pre-test scores between the treatment and control group do not significantly vary on each of the four study factors. (i.e. Pre-test $O_{1}$ & $O_{3}$). See Figure 4, pg.96.

2. $H_{03}$ Post-test scores between the two treatment groups do not significantly vary on each of the four study factors. (i.e. Post-test $O_{2}$ & $O_{6}$). See Figure 4, pg.96.

3. $H_{04}$ Post-test scores between the two control groups do not significantly vary of the four factors. (i.e. Post test $O_{4}$ compared to Post-test $O_{6}$). See Figure 4, pg.96.

4. $H_{05}$ There is no significant difference between the control group’s post test scores and the treatment group’s post test scores. (i.e. $O_{4}$ & $O_{6}$ and $O_{2}$ & $O_{6}$). See Figure 4, pg.96.

5. $H_{06}$ There is no significant difference between pre test and post test scores of the treatment group compared to the control group’s post-test scores.

The statistical procedure used was a Multivariate Analysis (MANOVA).
Sample Size

There were 141 students who took part in this study. In the pre tested control group 33 students took both the pre and post test. In the post-test-only group 30 students took the post test. In the pre tested experimental group 31 students took both the pre and post test. In the post-test-only group 39 students took the post test. Randomized selection was used to equalize the groups to 26. Twenty-six was selected because it was the greatest number of completed pre-post forms in all groups.

The control group consisted of 25 males and 35 females with a mean age of 24.2 years. The experimental group consisted of 54 males and 15 females with a mean age of 20.78 years.

Statistical Analysis

This first section addresses hypothesis 1 of the study only in relation to data acquired from How Do You Think Form E (Davis, 1977).

The independent variable of this study is defined as participation in adventure experiences. There are two levels of the independent variable: (1.) participation (2.) no desire to participate. A total of 129 subjects took part in this study with n=60 for the control group and n=69 for the treatment group.
The results are presented in Table 1. The results of the t-test \( (p < .05) \) indicate that college students who take part in adventure programs are more creative than those who choose not to participate. Thus, the groups were not equal on the factor of propensity toward creativity.

**TABLE 1**

Descriptive Statistics and T-Test of **How Do You Think** Form E

<table>
<thead>
<tr>
<th>GROUP</th>
<th>N</th>
<th>MEAN</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>69</td>
<td>327.07</td>
<td>44.36</td>
</tr>
<tr>
<td>2</td>
<td>60</td>
<td>297.75</td>
<td>40.42</td>
</tr>
</tbody>
</table>

Separate Variance \( T=3.92 \)  DF=126.70  Prob=.000  
Pooled Variance \( T=3.90 \)  DF=127.00  Prob=.000

Five hypotheses were developed to test the second dimension of this study, \( H_{02} \). A Multivariate Analysis (MANOVA) was used for each of the five hypotheses. The independent variable was participation with two levels—participation and no desire to participate in adventure activities. There are four dependent variables which comprise Sensation Seeking: Thrill and Adventure Seeking (TAS), Experience Seeking (ES), Disinhibition (DIS), and Boredom Susceptibility (BS).
$H_0$, like the following four hypotheses are hypothesized required to fully utilize the Solomon Four-Group design. $H_0$ stated: There is no significant difference between the control group’s pre test scores and the treatment groups pre test scores.

The null hypothesis was rejected at ($p < .05$) for the variables of Thrill and Adventure Seeking, Experience seeking, and Disinhibition (Table 2). Rejection of these elements of the hypothesis demonstrates that there is a significant difference between the experimental and the control groups on the three variables.

The null hypothesis component of Boredom susceptibility was not rejected. Failure to reject this hypothesis component indicates that there is no significant difference between the treatment and the control groups on this variable.
### TABLE 2

Results of MANOVA—Control Groups' Pre Test Scores—Compared to Pre Test Scores of Treatment Group

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>SS</th>
<th>DF</th>
<th>MS</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAS</td>
<td>62.481</td>
<td>1</td>
<td>62.481</td>
<td>12.777</td>
<td>0.001</td>
</tr>
<tr>
<td>ERROR</td>
<td>244.500</td>
<td>50</td>
<td>4.890</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ES</td>
<td>18.481</td>
<td>1</td>
<td>18.481</td>
<td>4.706</td>
<td>0.035</td>
</tr>
<tr>
<td>ERROR</td>
<td>196.346</td>
<td>50</td>
<td>3.927</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DIS</td>
<td>29.250</td>
<td>1</td>
<td>29.250</td>
<td>4.603</td>
<td>0.037</td>
</tr>
<tr>
<td>ERROR</td>
<td>317.731</td>
<td>50</td>
<td>6.335</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIS</td>
<td>13.000</td>
<td>1</td>
<td>13.000</td>
<td>3.271</td>
<td>0.077</td>
</tr>
<tr>
<td>ERROR</td>
<td>198.692</td>
<td>50</td>
<td>3.974</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Ho_3 states: Post test scores between the two experimental groups do not significantly vary on each of the four study factors. This hypothesis seeks to eliminate pre-post test interaction. The results of Ho_3 are presented in Table 3. Failure to reject this hypotheses (p > .05) suggests that there is no significant difference between the experimental pre-post test group and those in the post test only group. This would indicate that factors such as test familiarity and pre-post test interaction did not effect the outcome of the study significantly.

TABLE 3

Results of MANOVA Between Treatment Groups' Post Test Scores Compared to Post Only Scores

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>SS</th>
<th>DF</th>
<th>MS</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAS</td>
<td>0.019</td>
<td>1</td>
<td>0.019</td>
<td>0.008</td>
<td>0.930</td>
</tr>
<tr>
<td>ERROR</td>
<td>123.731</td>
<td>50</td>
<td>2.475</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ES</td>
<td>0.019</td>
<td>1</td>
<td>0.019</td>
<td>0.004</td>
<td>0.952</td>
</tr>
<tr>
<td>ERROR</td>
<td>258.962</td>
<td>50</td>
<td>5.179</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DIS</td>
<td>0.481</td>
<td>1</td>
<td>0.481</td>
<td>0.073</td>
<td>0.789</td>
</tr>
<tr>
<td>ERROR</td>
<td>330.962</td>
<td>50</td>
<td>6.619</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DIS</td>
<td>2.769</td>
<td>1</td>
<td>2.769</td>
<td>0.570</td>
<td>0.454</td>
</tr>
<tr>
<td>ERROR</td>
<td>243.000</td>
<td>50</td>
<td>4.860</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Ho4 was presented to also eliminate test familiarity and pre-post test interaction in the control group. Ho4 is stated: Post-test scores between the control group's do not significantly differ. The results are presented in Table 4.

Failure to reject the null hypotheses suggests there is no significant differences between individual's scores in the pre-post test control group and the post test only control group. Therefore, there is no indication that test familiarity and/or test interaction influenced the post test scores.

### TABLE 4

Results of Manova Between Control Groups’ Pre-Post Scores Compared to Post Only Scores

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>SS</th>
<th>DF</th>
<th>MS</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAS</td>
<td>17.308</td>
<td>1</td>
<td>17.308</td>
<td>2.175</td>
<td>0.147</td>
</tr>
<tr>
<td>ERROR</td>
<td>397.923</td>
<td>50</td>
<td>7.958</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ES</td>
<td>0.019</td>
<td>1</td>
<td>0.019</td>
<td>0.005</td>
<td>0.946</td>
</tr>
<tr>
<td>ERROR</td>
<td>210.038</td>
<td>50</td>
<td>4.201</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DIS</td>
<td>1.923</td>
<td>1</td>
<td>1.923</td>
<td>0.259</td>
<td>0.613</td>
</tr>
<tr>
<td>ERROR</td>
<td>371.385</td>
<td>50</td>
<td>7.428</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIS</td>
<td>0.481</td>
<td>1</td>
<td>0.481</td>
<td>0.119</td>
<td>0.731</td>
</tr>
<tr>
<td>ERROR</td>
<td>201.577</td>
<td>50</td>
<td>4.032</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
H_0 states: There is no significant difference between the control groups' post test scores and the treatment groups' post test scores.

The null hypothesis was rejected in three of the four variables: Thrill and Adventure Seeking, Experience Seeking, and Disinhibition. Failure to reject the null hypothesis was found in variable four, Boredom Susceptibility. (Table 5) These results suggest a significant statistical difference (p < .05) between the control and experimental groups post test scores in all but the factor of Boredom Susceptibility. The statistically significant difference may be attributed to the statistically significant different pre test scores with implication being the groups were significantly different prior to the study.

TABLE 5

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>SS</th>
<th>DF</th>
<th>MS</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAS</td>
<td>102.010</td>
<td>1</td>
<td>102.010</td>
<td>19.305</td>
<td>0.000</td>
</tr>
<tr>
<td>ERROR</td>
<td>538.981</td>
<td>102</td>
<td>5.284</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ES</td>
<td>32.346</td>
<td>1</td>
<td>32.346</td>
<td>7.034</td>
<td>0.009</td>
</tr>
<tr>
<td>ERROR</td>
<td>469.038</td>
<td>102</td>
<td>4.598</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DIS</td>
<td>63.087</td>
<td>1</td>
<td>63.087</td>
<td>9.131</td>
<td>0.003</td>
</tr>
<tr>
<td>ERROR</td>
<td>704.750</td>
<td>102</td>
<td>6.909</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIS</td>
<td>16.163</td>
<td>1</td>
<td>16.163</td>
<td>3.681</td>
<td>0.058</td>
</tr>
<tr>
<td>ERROR</td>
<td>447.927</td>
<td>102</td>
<td>4.390</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Ho would help to clarify the differences between post test scores of the treatment and control groups, by evaluating any gain in scores that occurred. Ho is presented as:

There is no significant difference between pre test and post test scores of the treatment group compared to the control groups pre and post test scores.

According to Harris (1975:101) a Manova is handled by reducing each subject's scores on p variables to a single number—a simple linear combination of his scores on those original p variables. Heuristically, one way Manova consists of a search for that linear combination of the variables which maximally discriminates among the k groups in the sense of producing the largest possible univariate f-ratio, followed by comparison of this largest possible univariate F to a critical value appropriate to such a statistic, taking into account the extreme capitalization on chance involved in finding it.

In order to answer the question of relation to gain scores between the control and treatment groups a new independent variable was created. This new variable was a dependent variable weighted by the appropriate canonical coefficients. The result of a MANOVA utilizing the new dependent variables is presented in Table 6 & 7. Table 6 shows there is no statistical difference in post test gain scores on sensation seeking between the control and treatment groups. Table 7 indicates failure to reject the hypothesis. There was no significant statistical gain in paired comparison scores.
A Pearson Correlation was used ex post facto to determine the degree of association shared by selected variables. A magnitude of the correlations (Davis, 1971) was used to help in the understanding of the relationships. Table 8 illustrates the correlation between scores on How Do You Think Form E and the Sensation Seeking Scale V. The results show a statistical substantial correlation between the variables at (p < .05) r=0.519.
TABLE 8
The Correlation Between Sensation Seeking and Creativity
\[ r = 0.519 \]

<table>
<thead>
<tr>
<th>DAVISTOT</th>
<th>POSTTOT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>0.519</td>
<td>1.000</td>
</tr>
</tbody>
</table>

NUMBER OF OBSERVATIONS: 86
\[ r^2 = .269 \]

FIGURE 5 The Correlation Between Sensation Seeking and Creativity

DAVISTOT = TOTAL SCORES OF TREATMENT AND CONTROL GROUP ON HOW DO YOU THINK FORM E.
POSTTOT = TOTAL SCORES OF TREATMENT AND CONTROL GROUP ON SENSATION SEEKING V.
Table 9 illustrates the correlation between scores in Thrill and Adventure Seeking and *How Do You Think Form E* \( r = 0.416 \). This is a moderate correlation between the variables.

**TABLE 9**

The Correlation Between Thrill and Adventure Seeking and Creativity \( r = 0.416 \)

<table>
<thead>
<tr>
<th></th>
<th>DAVIDSTOT</th>
<th>POSTTOT</th>
</tr>
</thead>
<tbody>
<tr>
<td>DAVIDSTOT</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>TAS2</td>
<td>0.416</td>
<td>1.000</td>
</tr>
</tbody>
</table>

**NUMBER OF OBSERVATIONS: 86**

\( r^2 = .173 \)

**FIGURE 6** The Correlation Between Thrill and Adventure Seeking and Creativity

DAVIDSTOT = TOTAL SCORES OF TREATMENT AND CONTROL GROUP ON *HOW DO YOU THINK FORM E*.

TAS2 = TOTAL SCORES OF TREATMENT AND CONTROL GROUP ON THE FACTOR OF THRILL AND ADVENTURE FROM SENSATION SEEKING V.
A moderate correlation was also found between the variables of Experience Seeking and scores on How Do You Think Form E as Table 10 illustrates.

\[ r = 0.493. \]

**TABLE 10**

The Correlation Between Experience Seeking and Creativity

<table>
<thead>
<tr>
<th></th>
<th>DAVIDSTOT</th>
<th>POSTOT</th>
</tr>
</thead>
<tbody>
<tr>
<td>DAVIDSTOT</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>ES2</td>
<td>0.493</td>
<td>1.000</td>
</tr>
</tbody>
</table>

**NUMBER OF OBSERVATIONS:** 86

\[ r^2 = 0.243 \]

**FIGURE 7** The Correlation Between Experience Seeking and Creativity

DAVIDSTOT=TOTAL SCORES OF TREATMENT AND CONTROL GROUP ON HOW DO YOU THINK FORM E.

ES2=TOTAL POST TEST SCORES OF TREATMENT AND CONTROL GROUP ON THE FACTOR OF EXPERIENCE SEEKING FROM SENSATION SEEKING V.
Table 11 illustrates a moderate correlation between the factor of Boredom Susceptibility and creativity \( r = 0.318 \).

**TABLE 11**

The Correlation Between Boredom Susceptibility and Creativity \( r = 0.318 \)

<table>
<thead>
<tr>
<th>DAVISTOT</th>
<th>POSTTOT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.000</td>
<td>0.318</td>
</tr>
</tbody>
</table>

NUMBER OF OBSERVATIONS: 86
\[ r^2 = 0.101 \]

**FIGURE 8** The Correlation Between Boredom Susceptibility and Creativity

DAVISTOT=TOTAL SCORES OF TREATMENT AND CONTROL GROUP ON HOW DO YOU THINK FORM E.
BS2=TOTAL POST TEST SCORES OF TREATMENT AND CONTROL GROUP ON THE FACTOR OF BOREDOM SUSCEPTIBILITY FROM SENSATIONSEEKING \( y \).
A low correlation was found between the factor of Disinhibition and scores of *How Do You Think Form E* as Table 12 illustrates.

**TABLE 12**

The Correlation Between Disinhibition and Creativity

<table>
<thead>
<tr>
<th></th>
<th>DAVIDSTOT</th>
<th>POSTT</th>
<th>POSTTOT</th>
</tr>
</thead>
<tbody>
<tr>
<td>DAVIDSTOT</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DIS2</td>
<td>0.244</td>
<td>1.000</td>
<td></td>
</tr>
</tbody>
</table>

**NUMBER OF OBSERVATIONS:** 86  
**$r^2 = 0.059$**

**FIGURE 9** The Correlation Between Disinhibition and Creativity

DAVIDSTOTTOTAL = TOTAL SCORES OF TREATMENT AND CONTROL GROUP ON *HOW DO YOU THINK FORM E*.

DIS2 = TOTAL POST TEST SCORES OF TREATMENT AND CONTROL GROUP ON THE FACTOR OF DISINHIBITION FROM SENSATION SEEKING V.
CHAPTER V

DISCUSSION AND RECOMMENDATIONS

The purpose of this study was two-fold. The first dimension investigated if a propensity toward creativity and Sensation Seeking existed more in individuals who take part in adventure activities compared to those individuals who choose not to participate in such activities. Findings indicate that a dichotomy exists between the groups, the implication is that those individuals involved in adventure programs have a higher propensity toward creativity and Sensation Seeking than those who choose not to participate in adventure activities.

Davis (1986) noted creative individuals reflect traits of risk taking and adventure. Flow, (Csikszentmihalyi, 1975) was also found to relate to both adventure experiences and creativity. The author related intrinsic motivation to activities such as rock climbing. Authors such as Adams (1986), Reitz (1987), Parnes (1976), and Amabile (1983) also relate intrinsic motivation to creativity. Combining these author’s works it appears that individuals who take part in adventure experiences should reflect a higher propensity toward creativity than those who choose not to. Similarities exist among traits.
This study supported the concept that individuals who take part in adventure experiences should have a higher propensity toward creativity than those who choose not to participate. The second dimension of this study investigated sensation seeking in relation to creativity. A dichotomy was found among groups (participants and non-participants).

For these purposes creativity was defined as a life-style composed of traits that enable the individual to create novel applicable ideas. Within the context of creativity a high degree of play, problem-solving ability and risk-taking is necessitated to enhance creative ability. By using metaphoric education the individual processes new information by relating to past experiences, utilizing the individual personal reality (transderivational search). Teaching through metaphor and experiential education enhances the possibility of fostering creativity or a creative life style (Sanders and Sanders, 1984).

Each individual functions from a unique conceptual framework (Hawkins, 1985) or image. The framework is comprised of past experiences. All experiences are received through the senses and therefore are affected by cultural and emotional factors. Response varies to sensory input because of the conceptual framework. The individual responds to and functions from a personal reality. The
conceptual framework may limit responses, choices and the processes used in problem solving.

To move past the boundaries established by the conceptual framework, an environment that produces stress is necessitated. Perhaps the stress, or dissonance causes a flexibility in the conceptual framework allowing alternatives to be considered. Lewin (1955) regards implementing change as moving from present state to transition state to desired state. Personal or environmental stress is a great motivator of change, causing dissonance and a flexibility within the conceptual framework. (Freeze-thaw-re-freeze: Schein, 1961) Gerard (1962) notes a component in discovery is anxiety. Csikszentmihalyi (1975) postulates individuals are motivated to implement change through the flow experience. The boundaries between the regions of the self become permeable, allowing or forcing options to be considered.

To implement change a humanistic environment (Rogers, 1961) is necessitated wherein the individual feels it is safe to take both emotional and physical risks. Modeling is an important component within the environment (verbal and nonverbal) (instructor and peers). The environment in which challenge is presented must be a humanistic environment in which the learner is accepted as self. By altering an individual's conceptual framework, moving from extrinsic to intrinsic rewards through adventure based programs, an
individual's level of creativity may be enhanced or promoted.

Through exploratory play, another component of creativity, potential responses to the environment are explored, increasing the number of potential responses for future problem solving. Smith and Simon (1984) elaborate:

Because of the flexible and relatively unconstrained nature of play behaviour, it has often been suggested that one function of play, or at least one prevalent result of play, is an enhancement of problem-solving skills and the kind of innovative behaviour which often helps solve problems.

(Smith & Simon, 1984:199).

Play is negated by such methods as preoccupation with teaching and structure. External rewards and controls weaken internal motivation, a necessary component of creativity. It is also suggested that our professions lower an individual's trust in his/her self to generate ideas and alternatives. Two characteristics of professionalism also destroy play; control and fragmentation. Control is fostered within the educational system as negating play. Play is seen as a component of creativity allowing freedom, spontaneity, discovery, and utilization of right hemispheric functioning.

The implication is that each framework is unique. It might appear that conceptual frameworks are not readily subject to change, however, such is not the case. Metaphoric education is one possibility of initiating
change. The frameworks from which we function may be broad-based or limited and confining. Generally, an individual functions from the latter.

Conceptual frameworks are altered, but foundations are built from the ground. Through such programs individuals may develop positive self-concept, face challenges and succeed, regard failure as only a learning experience, and gain a respect for the natural world. Such a program should contain the most general and abstract kinds of thought that include the whole range of human experience in conjunction with logical analytical thought, with the objective of fostering new knowledge. Change and risk are also affected by our conceptual frameworks, in that both involve the potential of loss. The loss may be viewed as failure, or a journey into the unknown. The greatest potential for loss is reflected in loss of self or failure of self, a separation from others or a nonacceptance by others. Sisson (1985:39) states: "Most of the fears that inhibit risk taking lead ultimately to a subconscious fear that people will emotionally or physically withdraw from us". For an individual to re-evaluate, to reconsider concepts within the conceptual framework, a new perception of self must be obtained. This perception of self involves a review of one's abilities and a relinquishing of control over others and environment. Talbot and Kaplan (1986:183) found "...that the ways of perceiving which were acquired through
experience in wilderness surroundings had direct consequences for individual's views of their own abilities and interests and for their views of the larger world as well". An implication remains for the need of a holistic approach that takes into account an individual's goals, abilities and subjective evaluation of the external situation in order to alter the individual's conceptual framework.

In situations within a humanistic environment where challenge is faced intellectually and physically, evaluations are made and a sorting process begins. As an individual's conceptual framework becomes flexible, and change can begin. Perhaps, within such an environment creativity may be fostered or promoted. Stein (1962) regards disequilibrium as a factor in initiating creativity.

In the early stages of the process, the individual experiences a state of disequilibrium. One might say that the homeostasis has been disturbed, that there is a lack of closure or that there is a lack of satisfaction with the existing state of affairs. The creative individual may actively seek to disturb the equilibrium he previously attained or he may be responsive to disequilibria already existing in the environment. Creativity may be initiated through an active or a reactive process. (Stein, 1962:86-87)

A parallel may be indicated between outdoor adventure programs and the components necessary for fostering creativity. For example, the Outward Bound process may be defined as follows: "Outward Bound helps participants to
master a series of challenges and problem-solving tasks using a unique social setting in a high impact environment which are designed to increase student self-awareness, self-esteem and acceptance of others." (Pacific Crest Outward Bound Instructors Manual, 1984). The Davis model (1983) AUTA, consists of four steps of creative development. The components of the model are:

1. awareness of the importance of creativity and its role in personal development
2. understanding, includes the creative process, abilities and characteristics of creative people and their training.
3. techniques are categorized as personal, those that creative people use and standard techniques that are taught. eg. Brainstorming, synectics methods.
4. self-actualization, which includes an openness to experience, concern for others, and a life that is flexible and creative in all aspects.

One way to move from theory to application concerning the issue of adventure based education and creativity is to draw upon Davis' (1984) model of the creativity process. Using that model parallels can be observed between processes employed by adventure based programs and the fostering of the creative process.
I. Awareness

Awareness of other modes of response. This awareness is presented within the processes of outdoor adventure programs through (1.) the modeling of instructors in terms of self-confidence and openness. (2.) modeling of other student's actions and expectation of intrinsic rewards. Expectation of something new and different.

II. Understanding

Understanding encompasses an individual's uniqueness, different views of self and others and self in relation to the environment. A change in perception is necessary for growth to begin, as is controlled stress and cognitive dissonance. The understanding and change in perception begin by removal of roles the individual has been placed in from his/her previous socialization process. The same socialization processes that did not allow for play, fantasy, affective modes and placed little value on the right hemispheric functions, may be reconsidered and approached within a holistic experience. Group discussions help to promote interchange and dialogue among members thereby expressing acceptance of the uniqueness of the individual. Worth, leadership, self-esteem and mutual trust are established.

Vulnerability must be considered a primary factor in reaching toward personal growth and self-actualization, for
only within a situation where the individual allows
him/herself to be vulnerable will the individual begin to
trust another. For example, emotional vulnerability in
group discussions, or physical vulnerability such as in rock
climbing.

III. Techniques

Experience-information skills, that are an integration
of the right and left hemispheric function, are taught and
utilized. The right being applicable to awareness and the
left integrating action. Discovery and exploration
(pertaining to self and to the environment) is also
encouraged. A unique environment is necessary for the
process of change to begin, causing stress and cognitive
dissonance. The process of discovery also includes ones
limits and abilities. The newness of an activity,
environment, or social situation, promotes change placing us
out of our natural tendency to remain within the comfortable
repetitive modes of response.

Application is seen as in relation to skills gained
that are necessary for success within a given task,
application of knowledge is combined with skills, and
sensory perception when placed in a problem solving
environment.

IV. Self-actualization

Consists of openness to experience, concern for fellow
man, self-initiated learning, a creative approach to all
aspects of life and becoming what you are capable of being. The implications remain for a quest for wholeness, individuals who are diverse, creative and innovative, the individual in demand by the organizations of the 21st century.

The concepts that are found necessary to foster the creative processes within an individual are also found throughout adventure based educational programs. A humanistic environment where one is free to risk and discover his/her own limits and abilities, an environment where stress is applied to weaken the conceptual framework, and the utilization of experiential, metaphoric education may foster creativity through a new socialization process.

Progress comes as a result of creative work. To be creative, to look past the confines of the lab, classrooms, our limited language, and the narrow frameworks one functions from, the barriers must be removed. Removal of the barriers begins with the realization that an individual needs to challenge, and be challenged within a humanistic environment. In this context humanistic does not imply easy. It does however, help establish a trust that is necessary in a learning situation. Ferguson (1980: 293) addresses this topic.

The optimum environment for learning offers security enough to encourage exploration and effort, excitement enough to push us onward. Although a humanistic environment is not a sufficient condition for transformation/education, it engenders the necessary trust. We trust the
teachers who give us stress, pain or drudgery when we need it. And we resent those who push us for their own ego, stress us with double binds, or take us into the deep water when we’re still frightened of the shallow. Yet appropriate stress is essential. Teachers can fail to transform if they are afraid to upset the learner. Those who love us may well push us when we’re ready to fly. The too-soft teacher reinforces the learner’s natural wish to retreat and stay safe, never venturing out for new knowledge, never risking. The teacher must know when to let the learner struggle.

The second barrier to be removed is the nonacceptance of intelligent presentation of new information, as to create new paradigms, frameworks, or concepts. Perhaps, by considering a holistic approach to education containing experiential and metaphoric modes, students may be free to explore, create, discover and test new ideas within an environment of acceptance.

Kuhn (1962) refers to a paradigm shift. The shift could conceivably take place when or because creative thinking is taking place. Once we understand or are brave enough to acknowledge a holistic view, we can break free from advocating the "traditional" methods of acquiring knowledge we have come to accept with an emphasis on rote learning, low risk, and cloning others ideas. At that time acceptance or consideration may be given to a metaphoric, experiential mode of learning within a humanistic environment that promotes stress and challenge.

It might appear that the use of metaphor and the metaphoric right brain hemisphere, would be advantageous to
the growth of an individual and society. Scientists, musicians, artists, and writers such as Bertrand Russell, 20th century philosopher and mathematician; Wolfgang Mozart, Vincent Van Gogh, and D.H. Lawrence were known to use visualization (a right hemispheric function) or engaged in situations and activities that are produced visualization before significant creations or contributions were made. In Western culture, however, such acknowledgements are looked upon with wonder and suspicion and labeled "mystical". Eastern philosophy accepts right hemispheric functions and considers humans to be part of the relationship that exists in the natural world. Nature is not used as a backdrop for humans in Chinese and Japanese landscape painting, but is considered the whole, and people are merely parts of the whole. To discover a deeper harmony is to develop an understanding between the whole and the parts (Wilson, 1978).

Another factor that separates the Eastern and Western cultures is the conception of time—the seasons—birth in the spring, summer when growth and maturity take place, winter where death awaits until the following spring when the cycle begins anew with life. All of nature is a cycle; the seasons, tides, days, birth and death. Time also is seen as cyclic. (Samples, 1976; Wilson, 1978).

It would appear that within our accepted mode of existence, we alienate ourselves from the natural world.
Some miss the cycles of birth and death, of growth and change. Change needs to be observed and not pushed aside or ignored. Within the cycles of nature there is constant change. Roe, (1976:174) recognizes the relationship of creativity, the individual, nature, and the cultural climate.

If it is true, however, as I believe, that there is real creative potential in all human beings and that our cultural institutions, rooted in ancient misconceptions of the nature of man and his place in the universe, are enormously more effective in repressing it than encouraging it, our problem is not just to find the people who have somehow been able to resist these pressures. It is also to find ways to change the cultural climate.

Again a separation from the natural world takes place and an individual resists change. When the everyday events of our lives are disrupted there is potential for change, and stress is one of the great motivations of change. The stress may be personal, family problems, job related, the death of a friend, economic, or even success. Subtle stress also produces the potential for change and includes intellectual stress; a relationship with someone who's views differ greatly from yours, or concepts presented from reviewing literature. Stress becomes a necessary ingredient in promoting change. "Anything that disrupts the old order of our lives has the potential for triggering a transformation, a movement toward greater maturity, openness, strength" (Ferguson, 1980:73). The majority
resist change and avoid stress, but out of stress comes change, growth or perhaps, an affirmation of the individual's functioning framework.

Each individual functions from his/her unique conceptual framework. The framework is comprised, in part, of past experiences. All experiences are received through the senses and therefore are affected by cultural and emotional factors. Response varies in relation to sensory input because of the conceptual framework. The individual responds to and functions from a personal perspective of reality. The conceptual framework may limit responses, choices and the processes used in problem solving.

Maslow (1968) referred to an integrated mode of thought as "integrated creativity". Torrance and Mourad (1979) relate a superior style of information processing to a right or integrated style. Kleiner (1984:66) contributes additional insight to this concept.

The implication of research on brain hemisphere function for understanding the creative process and the interactions between the sciences and humanities are two-fold. First, because creative process appears to initiate in right hemisphere, scientists must be trained not only in verbal, symbolic, and logical thinking, but also in spatial relational and holistic thinking—the kind of thinking characteristic of the arts. Secondly, modern neuro-physiology has discovered that although the right and left sides of the brain have specialized functions, nevertheless in all ordinary activities and especially in creative science, both sides of the brain are active. It has been noted that with the development of the individual toward fuller functioning, the EEG, or brain wave patterns, become more symmetrical,
showing the same pattern on both sides. This integrated state is not simply a balance or alteration between two separate functions; it is not simply a balance or alternation between two separate functions; it is not 'half-one, half the other' or 'first one, then the other'. It is rather the merging of a new kind of energy, a new principle, symbolized by the 'center' that is a generating force in itself.

The integrated state or "new kind of energy" should be investigated using Jung's concept of the anima and animus. Perhaps, utilizing creativity or experiencing the flow phenomenon or peak experience is an integration of the two facets of the psyche. This integration could be considered an aspect of the peak experience or flow phenomenon in which the individual within the creative process has, for the moment, integrated both aspects. At that time, the right and left hemispheres are functioning holistically, accounting for some of the experiences reported by subjects involved in such activities. Consideration should be given that creative individuals may experience a merging of the anima or animus. Perhaps the flow phenomenon or peak experience is a manifestation of this integration. The end result being a unity within the psyche.
Hammer (1984) noted a fusion of feminine with masculine in creative individuals.

It is apparently in this fusion of the feminine with the masculine that part of the gift of these creative individuals lies. It is this fusion which allows the necessary sensitivity and intuitiveness, on the one hand, to combine with purposive action and determination, on the other hand, to result in the masculine-feminine blend necessary for creative artistry.

Learning through experiential education is: (1) Learning through discovery. (2) Experiencing the consequences of action with immediate feedback. (3) Time applicable, which includes: the teachable moment and relevancy of the experience to the learner. It also includes the responsibility to self, others and for decisions, while having the right to make mistakes and experience success.

Metaphor, as an instrument of education: (1) Integrates the right and left hemispheric functioning (2) is a holistic information processing mode. (3) utilizes the transderivational search.

Our attitudes concerning the components of a creative, innovative person should be re-evaluated and nurtured wherein the individual may participate more effectively in the organization and society of the 21st century. An ideal starting place would be to begin with children in the traditional educational system by offering programs alternative to traditional curriculum, with an emphasis on experiential, metaphoric education. Western culture
promotes a left-hemispheric mode of thinking within our educational systems. The many components that interrelate are found in self-actualized creativeness. By recognizing each component and the interactive effect in fostering creativity, insight may be gained into the creative process. The quest for answers may not be as mystical or elusive as we once imagined. In our striving for self-actualization, we are striving to release the creative potential within us. Maslow (1968:138) provides precis of this quest.

In any case, this all sounds as if we are dealing with a fundamental characteristic, inherent in human nature, a potentiality given to all or most human beings at birth, which most often is lost or buried or inhibited as the person gets enculturated.

Metaphoric experiential education may be the clue in releasing the potential.

Recommendations

Such factors as gender, the sample group consisting of college students, and some activities containing more elements of perceived risk could have influenced scores on the instruments. The possibility that males are socialized differently than females, could influence responses to questions such as: "I am a sensitive person" "I choke-up or sob at movies" or "I have taken things apart just to find out how they work". Age and the fact that the subjects were
college student could influence scores on Boredom Susceptibility and Disinhibition.

Activities that the subjects participated in may be related to the degree of Sensation Seeking. For example, the risk perceived in an activity such as rock climbing may be different than the risk in a backpacking experience. Therefore, it would be interesting to compare scores of creativity and sensation seeking of individuals involved in high risk activities to those of individuals involved in lower levels of risk.

The ceiling effect occurs when subjects are scoring at the highest possible value of the dependent variable. The ceiling effect may be a problem when response measures are used that have a maximum value (Marken, 1981). Such is the case in the Sensation Seeking Scale V (Zuckerman, 1979). A review of the raw scores of the experimental group indicates a trend toward maximum scores in the pre and post test. The lack of significant gain scores could be attributed to the ceiling effect.

Time must also be considered a factor. To implement change an educational program that is longer could possibly be more successful in implementing change. For example, the subjects took part in generally a week end experience. An adventure program of three or more weeks may be more successful.
The instrument Sensation Seeking Scale V (Zuckerman, 1979) also warrants comment. Updating of the instrument may prove beneficial especially with college age subjects. Comments such as "I'm not sure what a 'hippie' or a 'swinger' is" were overheard.

Recommendations for further study

Recommendations include:

1. Hammer (1984) utilized projective type instruments to assess creative personality. This type of instrument in conjunction with naturalistic inquiry and the How Do You Think Form E (Davis, 1977) should lend additional information into the creative process and the creative person. Ideally such a study would involve a treatment group and control group both involved in adventure experiences for a period of two to three weeks. The control group would be comprised of individuals who are experiencing an adventure activity for the first time. The treatment group would be comprised of individuals who have taken part in an adventure experience. Using a Solomon Four-Group Design a comparison should be made of control to control groups, treatment groups to treatment groups, and treatment to control groups.

2. Since individuals involved in adventure experiences show statistically significant higher scores on creativity than those who do not participate in such activities,
further research is needed to investigate if such programs could be used to foster creativity.

3. Future research should include investigation into the processes involved in an adventure experience. If a parallel does exist (example, flow phenomenon) between creativity and adventure experiences, insight may be gained into the creative process by investigating an adventure experience. Perhaps affective parallels exist. If they are recognized sections of the process could be emphasized, adding knowledge and means to foster creativity.

4. The issue of creativity and sensation seeking in relation to introvert or extrovert type personality also warrants further investigation. Perhaps an individual who is an introvert compensates for external stimuli through fantasy and play. In this case metaphoric experiential education would foster a necessary component of creativity.

5. Implications for the use of adventure programs to release creativity may be investigated as a mode of therapy for "troubled youth". Previous research has suggested that individuals are Sensation Seekers. A trait of some creatives is rebelliousness, which inhibers stifled creativity and/or sensation seeking. Such tendencies may be channeled through educational programs emphasizing metaphoric, experiential adventure programs. Suggestions would include and assessment of "troubled youth" in relation to creativity and Sensation Seeking scores.
6. In this study correlations between disinhibition and sensation seeking were not made. Raw scores suggest relatively low scores in both the control and experimental groups. Such a correlation if found would support the adverse effects of some socialization practices as were addressed in this study.
LIST OF REFERENCES


McInnis, Noel F. "Teach the Earth Whole". 1971.


Sperry, Roger. California Institute of Technology, psychologist; Nobel Prize Winner, 1981.


Young, John G. "What is Creativity". Journal of Creative Behavior, 17, (2) Second Quarter 77-87.

APPENDIX A

How Do You Think Form E
HOW DO YOU THINK

FORM E. ADULT

College Major_________________ Sex__________

Year (Jr., Sr., Grad.)_________ Age__________

These questions ask about your interests, attitudes, and self-perceptions. All questions are in a rating-scale form which allows you to indicate the degree to which the statement applies to you, or the degree to which you agree with or accept the statement. Mark your answers on the questionnaire. There are no "right" or "wrong" answers, just be honest.

Professor Gary Davis
University of Wisconsin
1025 West Johnson Street
Madison, Wisconsin 53706
Copyright 1977 Gary A. Davis

Part A. Indicate the degree to which each statement applies to you. Mark your answers on the sheet according to the following scale.

A. No
B. To a small extent
C. Average
D. More than average
E. Definitely

___1. I enjoy the confusion of a big city.
___2. I often think like a child.
___3. I am sophisticated.
___4. I am very independent.
___5. I am very likely to do things on impulse.
___6. I choke-up or sob in many movies.
___7. I would like to live and work in a foreign country.
8. When I was young, I was always building or making things.
9. I would like to learn mountain-climbing.
10. I usually value others' opinions more than my own.
11. I have a great many interests.
12. I am unconventional in many ways.
13. I would like to try sky-diving (parachute jumping).
14. I prefer to pre-plan and schedule vacations carefully.
15. I have done a lot of creative writing.
16. My parents participate in or were highly interested in an art or writing.
17. My parents were always in some form of hobbies or crafts.
18. I am a sensitive person.
19. I am very artistic.
20. I am neat and well-ordered.
21. I would like to have lived in the early unsettled days of our American history.
22. I am quite absent minded.
23. I worry about being considered foolish.
24. I am often inventive or ingenious.
25. I enjoy trying new approaches to problems.
26. I usually jump right into a lake or pool, instead of slowly getting used to it.
27. I am a risk-taker.
28. I would like to be hypnotized.
29. I like a cold, brisk day.

Part B. Indicate the degree to which you accept or believe the seven statements below. Use the following scale.

A. False
B. Probably False
C. Don't Know (neutral)
D. Might be true
E. True

30. Many people can mentally communicate with others through extra-sensory perception (ESP).
31. Psychics truly possess a mysterious ability to know things about a person's past and future.
32. Psychics also are able to predict such things as nation disasters, election results, political assassinations, etc.
33. Many stories of mysterious, psychical happenings are true.
34. Spirits may be contacted by mediums or others with special psychic powers.
35. Flying saucers are visitors from outer space.
36. Strong mental concentration can exert a slight physical force.
Part C. Indicate how strongly you agree or disagree with the Statement below.
   A. Totally disagree
   B. Mostly disagree
   C. Neutral
   D. Mostly agree
   E. Totally agree

___37. It is important to be able to laugh at ourselves.
___38. It is better to be calm and even tempered than emotionally expressive.
___39. The world would be better off if youth were disciplined more severely.
___40. A good painting should give you a jolt.
___41. I know what I will be doing ten years from now.
___42. I would rate myself high in self-confidence.

Part D. Indicate the degree to which each statement applies to you. Use the following scale.
   A. No
   B. To a small extent
   C. Average
   D. More than average
   E. Definitely

___43. I am confident about my intellectual abilities.
___44. I worry about making mistakes.
___45. I tend to be cynical.
___46. I would like a career which involves much traveling.
___47. I have a great sense of humor.
___48. I have always been active in drawing or painting.
___49. I prefer activities which are predictable.
___50. I would like to get a pilot’s license.
___51. I like to explore new cities alone, even if I get lost.
___52. I am a very active, energetic person.
___53. I enjoy thinking of new and better ways of doing things.
___54. I am very curious.
___55. I tend to become childishly involved with simple things.
___56. I am quite original and imaginative.
___57. I have had many hobbies.
___58. Some of my past or present hobbies would be considered "unusual".
___59. I am very idealistic.
___60. I like the nonsense forms and bright colors of modern art.
___61. I enjoy some amount of ambiguity in my life.
___62. My ideas are often considered "impractical" or even "wild".
63. I would like to be considered courteous and emotionally stable.
64. I am very concerned about what others think of me.
65. I like to play tag, hopscotch, etc. with the kids.
66. I have a peaceful, non-enthusiastic approach to life.
67. I am very "reflective".
68. I would rate myself high in "intuition" or "insightfulness."
69. I avoid activities which are a little frightening.
70. I like some body smells.
71. I would take a college course which 50 percent flunk.
72. I am able to work intensely on a project for many hours.
73. I like trying new ideas and new approaches to problems.
74. I am witty.
75. I often become totally engrossed in a new idea.
76. I live in a room which is usually a mess.
77. On vacation, I prefer a good motel to camping.
78. I am absolutely against drugs which might produce hallucinations or other strange effects.
79. I would like to take up skiing.
80. I am very conscious of aesthetic considerations.
81. Most of my friends are unconventional.
82. The word "quick" describes me.
83. I try to use metaphors and analogies in my writing.
84. I am moody.
85. I could be considered a "spontaneous" person.
86. I have engaged in a lot of creative activities.
87. I take a playful approach to most things.
88. I am always open to new ideas and new activities.
89. Throughout my education, I had a lot of part-time jobs.
90. I have participated in theatrical productions.
91. I am usually outspoken in my opinions.
92. Financial success is highly important to me.
93. I often reflect on my personal values.
94. I often attend concerts.
95. My parents visit art galleries and museums.
96. I enjoy a job with unforeseeable difficulties.
97. I think it's fun to explore museums.
98. I can sometimes "get lost" in the library for hours, just looking at interesting books.
99. Sometimes I get so interested in a new idea that I neglect what I should be doing.
100. I have taken things apart just to find out how they work.
APPENDIX B

Sensation Seeking Scale V
College Major_________________  Sex__________

Year (Jr., Sr., Grad.)__________  Age_________

DIRECTIONS: Each of the items below contains two choices, A and B. Please indicate which of the choices most describes your likes or the way you feel. In some cases you may find items in which both choices describe your likes or the way you feel. Please choose the one which better describes your likes or feelings. In some cases you may find items in which you do not like either choice. In these cases mark the choice you dislike least.

It is important you respond to all items with only one choice, A or B. We are interested only in your likes or feelings, not in how others feel about these things or how one is supposed to feel. There are no right or wrong answers as in other kinds of tests. Be frank and give your honest appraisal of yourself.

INTEREST AND PREFERENCE TEST FORM V

1. A. I like "wild" uninhibited parties.  
   B. I prefer quiet parties with good conversation.

2. A. There are some movies I enjoy seeing a second or even a third time.  
   B. I can't stand watching a movie that I've seen before.

3. A. I often wish I could be a mountain climber.  
   B. I can't understand people who risk their necks climbing mountains.

4. A. I dislike all body odors.  
   B. I like some of the earthy body smells.

5. A. I get bored seeing the same old faces.  
   B. I like the comfortable familiarity of everyday friends.

6. A. I like to explore a strange city or section of town by myself even if it means getting lost.  
   B. I prefer a guide when I am in a place I don't know well.
7. A. I dislike people who do or say things just to shock or upset others.
   B. When you can predict almost everything a person will do and say he or she must be a bore.

8. A. I usually don’t enjoy a movie or a play where I can predict what will happen in advance.
   B. I don’t mind watching a movie or play where I can predict what will happen in advance.

9. A. I have tried marijuana or would like to.
   B. I would never smoke marijuana.

10. A. I would not like to try any drug which might produce strange and dangerous effects on me.
    B. I would like to try some of the new drugs that produce hallucinations.

11. A. A sensible person avoids activities that are dangerous.
     B. I sometimes like to do things that are a little frightening.

12. A. I dislike "swingers".
     B. I enjoy the company of real "swingers".

13. A. I find that stimulants make me uncomfortable.
     B. I often like to get high (drinking liquor or smoking marijuana).

14. A. I like to try new foods that I have never tasted before.
     B. I order the dishes with which I am familiar, so as to avoid disappointment and unpleasantness.

15. A. I enjoy looking at home movies or travel slides.
     B. Looking at someone’s home movies or travel slides bores me tremendously.

16. A. I would like to take up the sport of water-skiing.
     B. I would not like to take up water-skiing.

17. A. I would like to try surf-board riding.
     B. I would not like to try surf-board riding.

18. A. I would like to take off on a trip with no pre-planed or definite routes, or timetable.
     B. When I go on a trip I like to plan my route and timetable fairly carefully.
19. A. I prefer the "down-to-earth" kinds of people as friends.  
    B. I would like to make friends in some of the "far-out" groups like artists or "hippies."

20. A. I would not like to learn to fly an airplane.  
    B. I would like to learn to fly an airplane.

21. A. I prefer the surface of the water to the depths.  
    B. I would like to go scuba diving.

22. A. I would like to meet some persons who are homosexual (men or women).  
    B. I stay away from anyone I suspect of being "queer."

23. A. I would like to try parachute jumping.  
    B. I would never want to try jumping out of a plane with or without a parachute.

24. A. I prefer friends who are excitingly unpredictable.  
    B. I prefer friends who are reliable and predictable.

25. A. I am not interested in experience for its own sake.  
    B. I like to have new and exciting experiences and sensations even if they are a little frightening, unconventional or illegal.

26. A. The essence of good art is in its clarity, symmetry of form and harmony or colors.  
    B. I often find beauty in the "clashing" colors and irregular forms of modern painting.

27. A. I enjoy spending time in the familiar surroundings of home.  
    B. I get very restless if I have to stay around home for any length of time.

28. A. I like to go off the high board.  
    B. I don’t like the feeling I get standing on the high board (or I don’t go near it).

29. A. I like to date members of the opposite sex who are physically exciting.  
    B. I like to date members of the opposite sex who share my values.

30. A. Heavy drinking usually ruins a party because some people get loud and boisterous.  
    B. Keeping the drinks full is the key to a good party.

31. A. The worst social sin is to be rude.  
    B. The worst social sin is to be a bore.
32. A. A person should have considerable sexual experience before marriage.
   B. It's better if two married persons begin their sexual experience with each other.

33. A. Even if I had the money I would not care to associate with flighty persons like those in the "jet set".
   B. I could conceive of myself seeking pleasure around the world with the "jet set".

34. A. I like people who are sharp and witty even if they do sometimes insult others.
   B. I dislike people who have their fun at the expense of hurting the feelings of others.

35. A. There is altogether too much portrayal of sex in movies.
   B. I enjoy watching many of the "sexy" scenes in movies.

36. A. I feel best after taking a couple of drinks.
   B. Something is wrong with people who need liquor to feel good.

37. A. People should dress according to some standards of taste, neatness, and style.
   B. People should dress in individual ways even if the effects are sometimes strange.

38. A. Sailing long distances in small sailing crafts is foolhardy.
   B. I would like to sail a long distance in a small but seaworthy sailing craft.

39. A. I have no patience with dull or boring persons.
   B. I find something interesting in almost every person I talk with.

40. A. Skiing down a high mountain slope is a good way to end up on crutches.
   B. I think I would enjoy the sensations of skiing very fast down a high mountain slope.
APPENDIX C

First Correspondence to Participants
Dear,

I wanted to extend a personal thank you for agreeing to take part in this study which is part of my graduate research. By completing the attached questionnaire you will be helping to create a new curriculum in education. Your response is an essential part of this research, and all responses are confidential.

There are two parts to this research. In about a week you will be receiving a questionnaire which also must be filled out. Each section of the research will take about fifteen minutes of your time. Please answer all questions. Your time and effort are greatly appreciated.

With your help, I hope to graduate in March, and trust your graduation date is nearing too.

Please return the questionnaire booklet in the enclosed stamped envelope by January 13, 1989.

Further information and results will be available after March 30, 1989 by contacting:

Suzie Hanes
School of Natural Resources
Kottman Hall
2021 Coffey Rd.
Columbus, Ohio 43210-1085
292-9828

Again thank you for your participation,

Suzie Hanes
APPENDIX D

Second Correspondence to Participants
Hello,

Did we get lost in the mail or just cross on our journey? As of this date I have not received your questionnaire. Please take a few minutes to complete your questionnaire if you have not as yet finished it. Your response is valuable!

As was mentioned in my first letter there are two parts to this research. This is the second and final part! Please complete the enclosed questionnaire by January 28, 1989 and return in the self addressed stamped envelope.

Response so far has been excellent. I will be glad to discuss the research project with you. Remember further information and results will be available after March 30, 1989 by contacting:

Suzie Hanes  
School of Natural Resources  
Kottman Hall  
2021 Coffey Rd.  
Columbus, Ohio 43210-1085  
292-9828

Again thank you for your participation,

Suzie Hanes
APPENDIX E

Descriptive Data of Non-Participants in Adventure Programs
Table 13
Descriptive Data of Non-Participants

<table>
<thead>
<tr>
<th>SUBJECT</th>
<th>AGE</th>
<th>YEAR</th>
<th>MAJOR</th>
<th>SEX</th>
</tr>
</thead>
<tbody>
<tr>
<td>P01</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P02</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P03</td>
<td>19</td>
<td>SOPH.</td>
<td>COMMUNICATION</td>
<td>F</td>
</tr>
<tr>
<td>P04</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P05</td>
<td>23</td>
<td>GRAD</td>
<td>VET. MED</td>
<td>F</td>
</tr>
<tr>
<td>P06</td>
<td>21</td>
<td>JR.</td>
<td>SOC. WORK</td>
<td>M</td>
</tr>
<tr>
<td>P07</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P08</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P09</td>
<td>29</td>
<td>GRAD.</td>
<td>BIOLOGY</td>
<td>M</td>
</tr>
<tr>
<td>P010</td>
<td>34</td>
<td>JR.</td>
<td>COMMUNICATION</td>
<td>F</td>
</tr>
<tr>
<td>P011</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P012</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P013</td>
<td>22</td>
<td>SR.</td>
<td>CERAM. ENG.</td>
<td>M</td>
</tr>
<tr>
<td>P014</td>
<td>20</td>
<td>JR.</td>
<td>JOURNALISM</td>
<td>F</td>
</tr>
<tr>
<td>P015</td>
<td>26</td>
<td>GRAD.</td>
<td>EDUCATION</td>
<td>F</td>
</tr>
<tr>
<td>P016</td>
<td>21</td>
<td>SR.</td>
<td>PSYCHOLOGY</td>
<td>F</td>
</tr>
<tr>
<td>P017</td>
<td>19</td>
<td>FR.</td>
<td>PRE VET.</td>
<td>F</td>
</tr>
<tr>
<td>P018</td>
<td>18</td>
<td>FR.</td>
<td>UNDECIDED</td>
<td>F</td>
</tr>
<tr>
<td>P019</td>
<td>19</td>
<td>SOPH.</td>
<td>PHYSICS</td>
<td>M</td>
</tr>
<tr>
<td>P020</td>
<td>18</td>
<td>FR.</td>
<td>UNDECIDED</td>
<td>F</td>
</tr>
<tr>
<td>P021</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P022</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P023</td>
<td>19</td>
<td>SOPH.</td>
<td>ENGLISH</td>
<td>F</td>
</tr>
<tr>
<td>P024</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P025</td>
<td>22</td>
<td>SR.</td>
<td>ENGINEERING</td>
<td>M</td>
</tr>
<tr>
<td>P026</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P027</td>
<td>19</td>
<td>SOPH.</td>
<td>PHYSICS</td>
<td>M</td>
</tr>
<tr>
<td>P028</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P029</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P030</td>
<td>24</td>
<td>GRAD</td>
<td>VET. MED.</td>
<td>M</td>
</tr>
<tr>
<td>P031</td>
<td>28</td>
<td>GRAD</td>
<td>LANGUAGE</td>
<td>F</td>
</tr>
<tr>
<td>P032</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P033</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P034</td>
<td>18</td>
<td>FR.</td>
<td>ZOOLOGY</td>
<td>F</td>
</tr>
<tr>
<td>P035</td>
<td>28</td>
<td>GRAD</td>
<td>BUSINESS</td>
<td>M</td>
</tr>
<tr>
<td>P036</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P037</td>
<td>26</td>
<td>GRAD</td>
<td>COMPUTER SCI.</td>
<td>M</td>
</tr>
<tr>
<td>P038</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P039</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P040</td>
<td>29</td>
<td>GRAD</td>
<td>PATHOLOGY</td>
<td>F</td>
</tr>
<tr>
<td>P041</td>
<td>36</td>
<td>JR.</td>
<td>PHARMACY</td>
<td>F</td>
</tr>
<tr>
<td>P042</td>
<td>19</td>
<td>JR.</td>
<td>LAND HORT.</td>
<td>F</td>
</tr>
<tr>
<td>------</td>
<td>----</td>
<td>-----</td>
<td>------------</td>
<td>---</td>
</tr>
<tr>
<td>P043</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P044</td>
<td>30</td>
<td>GRAD</td>
<td>ENGINEERING</td>
<td>M</td>
</tr>
<tr>
<td>P045</td>
<td>33</td>
<td>Ph.D.</td>
<td>EDUCATION</td>
<td>M</td>
</tr>
<tr>
<td>P046</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P047</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P048</td>
<td>20</td>
<td>SOPH.</td>
<td>ENGINEERING</td>
<td>M</td>
</tr>
<tr>
<td>P049</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**CONTROL GROUP**

<table>
<thead>
<tr>
<th>SUB</th>
<th>AGE</th>
<th>YEAR</th>
<th>MAJOR</th>
<th>SEX</th>
</tr>
</thead>
<tbody>
<tr>
<td>PP1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PP2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PP3</td>
<td>23</td>
<td>SR.</td>
<td>PSYCHOLOGY</td>
<td>M</td>
</tr>
<tr>
<td>PP4</td>
<td>26</td>
<td>GRAD</td>
<td>OPTOMETRY</td>
<td>M</td>
</tr>
<tr>
<td>PP5</td>
<td>21</td>
<td>JR.</td>
<td>BUSINESS</td>
<td>M</td>
</tr>
<tr>
<td>PP6</td>
<td>19</td>
<td>FR.</td>
<td>ZOOLOGY</td>
<td>F</td>
</tr>
<tr>
<td>PP7</td>
<td>21</td>
<td>JR.</td>
<td>JOURNALISM</td>
<td>F</td>
</tr>
<tr>
<td>PP8</td>
<td>20</td>
<td>SR.</td>
<td>CHEM. ENG.</td>
<td>M</td>
</tr>
<tr>
<td>PP9</td>
<td>26</td>
<td>SR.</td>
<td>PSYCHOLOGY</td>
<td>F</td>
</tr>
<tr>
<td>PP10</td>
<td>20</td>
<td>JR.</td>
<td>DENTAL HYG.</td>
<td>F</td>
</tr>
<tr>
<td>PP11</td>
<td>54</td>
<td>GRAD</td>
<td>EDUCATION</td>
<td>F</td>
</tr>
<tr>
<td>PP12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PP13</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PP14</td>
<td>35</td>
<td>GRAD.</td>
<td>PUBLIC ADM.</td>
<td>F</td>
</tr>
<tr>
<td>PP15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PP16</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PP17</td>
<td>20</td>
<td>JR.</td>
<td>BUSINESS</td>
<td>M</td>
</tr>
<tr>
<td>PP18</td>
<td>52</td>
<td>GRAD.</td>
<td>EDUCATION</td>
<td>M</td>
</tr>
<tr>
<td>PP19</td>
<td>25</td>
<td>SR.</td>
<td>CHILD DEVE.</td>
<td>F</td>
</tr>
<tr>
<td>PP20</td>
<td>20</td>
<td>JR.</td>
<td>WILDLFMANAG.</td>
<td>M</td>
</tr>
<tr>
<td>PP21</td>
<td>22</td>
<td>SR.</td>
<td>FINANCE</td>
<td>F</td>
</tr>
<tr>
<td>PP22</td>
<td>21</td>
<td>SR.</td>
<td>NURSING</td>
<td>F</td>
</tr>
<tr>
<td>PP23</td>
<td>30</td>
<td>JR.</td>
<td>ENGLISH</td>
<td>M</td>
</tr>
<tr>
<td>PP24</td>
<td>18</td>
<td>SOPH.</td>
<td>UNDECIDED</td>
<td>F</td>
</tr>
<tr>
<td>PP25</td>
<td>20</td>
<td>JR.</td>
<td>EDUCATION</td>
<td>F</td>
</tr>
<tr>
<td>PP26</td>
<td>19</td>
<td>FR.</td>
<td>PRE.PHARM.</td>
<td>F</td>
</tr>
<tr>
<td>PP27</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PP28</td>
<td>23</td>
<td>GRAD.</td>
<td>BUSINESS</td>
<td>M</td>
</tr>
<tr>
<td>PP29</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PP30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PP31</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PP32</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PP33</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PP34</td>
<td>20</td>
<td>JR.</td>
<td>PSYCHOLOGY</td>
<td>F</td>
</tr>
<tr>
<td>Code</td>
<td>Age</td>
<td>Year</td>
<td>Major</td>
<td>Gender</td>
</tr>
<tr>
<td>------</td>
<td>-----</td>
<td>------</td>
<td>-------</td>
<td>--------</td>
</tr>
<tr>
<td>PP35</td>
<td>21</td>
<td>JR</td>
<td>ENGLISH</td>
<td>F</td>
</tr>
<tr>
<td>PP36</td>
<td>28</td>
<td>GRAD.</td>
<td>SOCIAL WK</td>
<td>F</td>
</tr>
<tr>
<td>PP37</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P38</td>
<td>35</td>
<td>GRAD.</td>
<td>REPROD.</td>
<td></td>
</tr>
<tr>
<td>PP39</td>
<td>28</td>
<td>GRAD.</td>
<td>ENDOMOLOGY</td>
<td>M</td>
</tr>
<tr>
<td>PP40</td>
<td>24</td>
<td>SR.</td>
<td>VET. MED.</td>
<td>M</td>
</tr>
<tr>
<td>PP41</td>
<td>24</td>
<td>GRAD.</td>
<td>MUSIC ED.</td>
<td>M</td>
</tr>
<tr>
<td>PP42</td>
<td>22</td>
<td>SR.</td>
<td>GEOGRAPHY</td>
<td>F</td>
</tr>
<tr>
<td>PP43</td>
<td>19</td>
<td>FR.</td>
<td>CHEM. ENG.</td>
<td>M</td>
</tr>
<tr>
<td>PP44</td>
<td>21</td>
<td>SR.</td>
<td>UNDECIDED</td>
<td>F</td>
</tr>
<tr>
<td>PP45</td>
<td>18</td>
<td>FR.</td>
<td>DENTAL HYG.</td>
<td>F</td>
</tr>
<tr>
<td>PP46</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PP47</td>
<td>21</td>
<td>JR.</td>
<td>PSYCHOLOGY</td>
<td>F</td>
</tr>
</tbody>
</table>
APPENDIX F

Descriptive Data of Participants in Adventure Programs
### TABLE 14
Descriptive Data of the Adventure Participants

<table>
<thead>
<tr>
<th>SUBJECT</th>
<th>AGE</th>
<th>YEAR</th>
<th>MAJOR</th>
<th>SEX</th>
</tr>
</thead>
<tbody>
<tr>
<td>BACKPACKING</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>19</td>
<td>SOPH</td>
<td>AERO ENG.</td>
<td>M</td>
</tr>
<tr>
<td>2</td>
<td>19</td>
<td>FR.</td>
<td>COMMUNICAT</td>
<td>M</td>
</tr>
<tr>
<td>3</td>
<td>29</td>
<td>SR.</td>
<td>AG ECON</td>
<td>M</td>
</tr>
<tr>
<td>4</td>
<td>20</td>
<td>JR.</td>
<td>WILDLIFE MANG</td>
<td>M</td>
</tr>
<tr>
<td>5</td>
<td>22</td>
<td>SOPH</td>
<td>PHARMACY</td>
<td>F</td>
</tr>
<tr>
<td>6</td>
<td>21</td>
<td>SR.</td>
<td>JOURNALISM</td>
<td>F</td>
</tr>
<tr>
<td>7</td>
<td>21</td>
<td>SOPH</td>
<td>NR</td>
<td>M</td>
</tr>
<tr>
<td>8</td>
<td>23</td>
<td>SR.</td>
<td>ENG</td>
<td>M</td>
</tr>
<tr>
<td>9</td>
<td>23</td>
<td>JR.</td>
<td>MECH.ENG.</td>
<td>M</td>
</tr>
<tr>
<td>CAVING</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>20</td>
<td>JR.</td>
<td>ENG</td>
<td>M</td>
</tr>
<tr>
<td>11</td>
<td>20</td>
<td>JR.</td>
<td>WILDLIFE MANG</td>
<td>M</td>
</tr>
<tr>
<td>12</td>
<td>21</td>
<td>SR.</td>
<td>HISTORY</td>
<td>M</td>
</tr>
<tr>
<td>13</td>
<td>21</td>
<td>SR.</td>
<td>INT BUS.</td>
<td>M</td>
</tr>
<tr>
<td>14</td>
<td>18</td>
<td>FR.</td>
<td>CHEM</td>
<td>M</td>
</tr>
<tr>
<td>15</td>
<td>21</td>
<td>SR.</td>
<td>POLI.SCI</td>
<td>F</td>
</tr>
<tr>
<td>16</td>
<td>25</td>
<td>SR.</td>
<td>ART ED.</td>
<td>F</td>
</tr>
<tr>
<td>CANOEING</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>29</td>
<td>JR.</td>
<td>SCIENCE</td>
<td>M</td>
</tr>
<tr>
<td>18</td>
<td>22</td>
<td>SR.</td>
<td>AG. ECON.</td>
<td>M</td>
</tr>
<tr>
<td>19</td>
<td>21</td>
<td>SR.</td>
<td>AG. MECH.</td>
<td>M</td>
</tr>
<tr>
<td>20</td>
<td>31</td>
<td>GRAD.</td>
<td>ENG.</td>
<td>M</td>
</tr>
<tr>
<td>21</td>
<td>20</td>
<td>JR.</td>
<td>ENG.</td>
<td>M</td>
</tr>
<tr>
<td>22</td>
<td>24</td>
<td>JR.</td>
<td>NUTRITION</td>
<td>F</td>
</tr>
<tr>
<td>23</td>
<td>21</td>
<td>SR.</td>
<td>SCIENCE ED.</td>
<td>F</td>
</tr>
<tr>
<td>24</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROCKCLIMBING</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>20</td>
<td>JR.</td>
<td>ENG.</td>
<td>M</td>
</tr>
<tr>
<td>27</td>
<td>19</td>
<td>SOPH.</td>
<td>BIOLOGY</td>
<td>M</td>
</tr>
<tr>
<td>28</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>23</td>
<td>SR.</td>
<td>ASC</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>30</td>
<td>18</td>
<td>FR.</td>
<td>ELECT. ENG.</td>
<td>M</td>
</tr>
<tr>
<td>31</td>
<td>23</td>
<td>FR.</td>
<td>AVIATION</td>
<td>M</td>
</tr>
<tr>
<td>32</td>
<td>18</td>
<td>FR.</td>
<td>ENG.</td>
<td>M</td>
</tr>
<tr>
<td>33</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAVING</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>24</td>
<td>SR.</td>
<td>INDS. DESIGN</td>
<td>M</td>
</tr>
<tr>
<td>35</td>
<td>20</td>
<td>JR.</td>
<td>ME</td>
<td>M</td>
</tr>
<tr>
<td>36</td>
<td>22</td>
<td>FR.</td>
<td>CINEMA</td>
<td>M</td>
</tr>
<tr>
<td>37</td>
<td>22</td>
<td>SR.</td>
<td>CERAMIC ENG.</td>
<td>M</td>
</tr>
<tr>
<td>38</td>
<td>19</td>
<td>SOPH.</td>
<td>ELECT. ENG.</td>
<td>M</td>
</tr>
<tr>
<td>39</td>
<td>21</td>
<td>SOPH.</td>
<td>ENG. PHYSICS</td>
<td>M</td>
</tr>
<tr>
<td>40</td>
<td>22</td>
<td>SR.</td>
<td>INDS. DESIGN</td>
<td>F</td>
</tr>
<tr>
<td>41</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROPES</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>42</td>
<td>18</td>
<td>FR.</td>
<td>UNDECIDED</td>
<td>F</td>
</tr>
<tr>
<td>43</td>
<td>18</td>
<td>FR.</td>
<td>PRE MED.</td>
<td>F</td>
</tr>
<tr>
<td>44</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>45</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>46</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>47</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>48</td>
<td>21</td>
<td>SR.</td>
<td>BUS.</td>
<td>M</td>
</tr>
<tr>
<td>49</td>
<td>22</td>
<td>JR.</td>
<td>NRS</td>
<td>M</td>
</tr>
<tr>
<td>50</td>
<td>23</td>
<td>JR.</td>
<td>INTERNAT STUD</td>
<td>M</td>
</tr>
<tr>
<td>51</td>
<td>30</td>
<td>GRAD.</td>
<td>PHYS. ED</td>
<td>F</td>
</tr>
<tr>
<td>52</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROCKCLIMBING</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>53</td>
<td>22</td>
<td>SR.</td>
<td>ACCT.</td>
<td>M</td>
</tr>
<tr>
<td>54</td>
<td>18</td>
<td>FR.</td>
<td>BIO.CHEM</td>
<td>F</td>
</tr>
<tr>
<td>55</td>
<td>18</td>
<td>FR.</td>
<td>UVC</td>
<td>F</td>
</tr>
<tr>
<td>56</td>
<td>26</td>
<td>CONT. ED.</td>
<td>CONT. ED.</td>
<td>M</td>
</tr>
<tr>
<td>57</td>
<td>20</td>
<td>JR.</td>
<td>BUS/FINANCE</td>
<td>M</td>
</tr>
<tr>
<td>58</td>
<td>22</td>
<td>SR.</td>
<td>BUS/MARKETING</td>
<td>M</td>
</tr>
<tr>
<td>59</td>
<td>29</td>
<td>GRAD.</td>
<td>FINE ARTS</td>
<td>M</td>
</tr>
<tr>
<td>60</td>
<td>22</td>
<td>SR.</td>
<td>PSYCHOLOGY</td>
<td>M</td>
</tr>
</tbody>
</table>
### TABLE 14 (cont.)

#### BACKPACKING

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>61</td>
<td>18</td>
<td>FR.</td>
<td>PRE-CIVIL</td>
<td>M</td>
</tr>
<tr>
<td>62</td>
<td>21</td>
<td>SR.</td>
<td>INDS.DESIGN</td>
<td>M</td>
</tr>
<tr>
<td>63</td>
<td>27</td>
<td>SR.</td>
<td>CIS. ENG.</td>
<td>M</td>
</tr>
<tr>
<td>64</td>
<td>21</td>
<td>SR.</td>
<td>REC. ED.</td>
<td>F</td>
</tr>
<tr>
<td>65</td>
<td>20</td>
<td>SOPH.</td>
<td>AVIATION</td>
<td>M</td>
</tr>
<tr>
<td>66</td>
<td>19</td>
<td>JR.</td>
<td>BUSINESS</td>
<td>M</td>
</tr>
<tr>
<td>67</td>
<td>20</td>
<td>JR.</td>
<td>ACCOUNTING</td>
<td>M</td>
</tr>
<tr>
<td>68</td>
<td>24</td>
<td>GRAD.</td>
<td>CIS</td>
<td>M</td>
</tr>
<tr>
<td>69</td>
<td>20</td>
<td>JR.</td>
<td>AVIATION</td>
<td>M</td>
</tr>
<tr>
<td>70</td>
<td>24</td>
<td>SR.</td>
<td>EDUCATION</td>
<td>F</td>
</tr>
<tr>
<td>71</td>
<td>20</td>
<td>SOPH.</td>
<td>NAT. RES.</td>
<td>M</td>
</tr>
<tr>
<td>72</td>
<td>27</td>
<td>JR.</td>
<td>ASC</td>
<td>M</td>
</tr>
</tbody>
</table>

#### ROCKCLIMBING

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>73</td>
<td>21</td>
<td>JR.</td>
<td>CINEMA</td>
<td>M</td>
</tr>
<tr>
<td>74</td>
<td>19</td>
<td>JR.</td>
<td>NRE</td>
<td>M</td>
</tr>
<tr>
<td>75</td>
<td>19</td>
<td>SOPH.</td>
<td>SOCIOLOGY</td>
<td>F</td>
</tr>
<tr>
<td>76</td>
<td>21</td>
<td>JR.</td>
<td>AG. BUS</td>
<td>M</td>
</tr>
<tr>
<td>77</td>
<td>18</td>
<td>FR.</td>
<td>AAE</td>
<td>M</td>
</tr>
<tr>
<td>78</td>
<td>23</td>
<td>SR.</td>
<td>MECH. ENG</td>
<td>M</td>
</tr>
<tr>
<td>79</td>
<td>21</td>
<td>JR.</td>
<td>ENG.</td>
<td>M</td>
</tr>
</tbody>
</table>