EFFECT OF ACTIVITY-STAGING STRATEGIES FOR ENGAGING PSYCHOLOGICAL NEEDS ON VALENCE D INTENTIONALITY TOWARD NATURE AMONG YOUTH IN A RESIDENTIAL TREATMENT PROGRAM

by

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SUPERVISORY COMMITTEE APPROVAL

This thesis has been read by each member of the following supervisory committee and by majority vote has been found to be satisfactory.

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I have read the thesis of Erik Brendon Yost in its final form and have found that (1) its format, citations, and bibliographic style are consistent and acceptable; (2) its illustrative materials including figures, tables, and charts are in place; and (3) the final manuscript is satisfactory to the supervisory committee and is ready for submission to The Graduate School.

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ABSTRACT

The purpose of this study is to examine the effects of activity staging strategies designed to target the basic psychological needs of autonomy, competence, and relatedness on valenced intentionality toward nature in teen-age male students enrolled in a residential treatment program. Procedures involved staging snowshoe outings for male students, age 14-17, enrolled in a residential treatment program in Salt Lake City, Utah. Residents in the program struggle with behavioral, emotional, learning, and substance abuse difficulties. Staff members of the weekend recreation program were trained in self-determination theory and facilitation of the staged experience. The snowshoe outing was designed and staged in order to target the satisfaction of the basic psychological needs of autonomy, competence, and relatedness as put forth by self-determination theory. Throughout the staged experience participants were asked to repeatedly rate their judgment of nature and feelings of vitality using an 14-item semantic differential scale which pits adjective pairs against one another to measure meaning (e.g., good...bad, like...dislike, repelling...attracting). Comparisons were made between treatment and nontreatment groups. Results of the data analysis support the hypotheses; a comparison of means suggests that all three activity staging techniques (environmental education lesson, choice
activity, and relatedness activity) significantly elevated scores on both valenced intentionality and vitality. Change values ($R^2$) for the environmental education lesson on valenced intentionality (.04) and vitality (< .001), choice activity on valenced intentionality (.04) and vitality (.009), and the relatedness activity on valenced intentionality (.03) and vitality (.00) suggest a weak effect size. $R^2$ change values for the treatment order variable on valenced intentionality (0.1) and vitality (.06) suggest a strong relationship between the dependent variables and the order in which participants received treatment. Practitioners can use these results to create efficacious and meaningful outing programs for youth in a residential treatment setting. Future research can explore more effective and efficient ways to strengthen the relationships supported in the present study.
To my parents for giving me a childhood close to nature
and thus the inspiration for this thesis
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CHAPTER I

INTRODUCTION

Valenced intentionality toward nature is an important outcome for outdoor education in virtually all populations, and may be a particularly important outcome for students with behavioral, emotional, and learning disabilities. Valenced intentionality refers to the cognitive value judgment which drives one’s emotional response; in the present case, one’s cognitive value judgment of nature (Nussbaum, 2001; Solomon, 1988). Recently, behavioral scientists have shown that contact with nature can create a number of positive outcomes for youth. Among these are help in counteracting attention difficulties (Kaplan & Kaplan, 1998; Taylor, Kuo, & Sullivan, 2001); alleviating depression, stress, and anxiety (Kahn, 1999; Wells & Evans, 2003); assistance in fostering concentration (Taylor, Kuo, & Sullivan, 2002); promoting growth and development (Moore, 1997); and stimulating creativity (Chawla, 1986; Cobb, 1977).

However, fear is an increasingly common emotion associated with natural areas (Bixler, Carlisle, Hammitt, & Floyd, 1994; Bixler & Floyd, 1997; Wohlwill, 1974), and creates a barrier to contact with nature (Louv, 2005). The cognitive aspect of fear has been described as the associations of feared objects with places and situations in which they may be encountered (Bixler, Floyd, & Hammitt, 1995). These negative associations of nature affect the value judgments that individuals make toward nature.
An understanding of how to most efficiently and effectively create valenced intentionality toward nature may provide professionals in youth-serving agencies with useful strategies for solving problems and facilitating well-being, growth, and development and to create positive associations with nature.

Staging transformational experiences (Pine & Gilmore, 1999) that are aimed at meeting the basic psychological needs of autonomy, competence, and relatedness (Deci & Ryan, 1985; 2002) may facilitate valenced intentionality toward nature in youth. Settings and situations that engage these psychological needs stimulate interest, and when activities or settings placate these needs, feelings of enjoyment or value result (Reeve, 2005). Existing research points to specific techniques that have been successfully used to stage such experiences. Long, Ellis, Trunnell, Tatsugawa, and Freeman (2001), for example, found that staging techniques that are designed to elicit situational feelings of competence elicit enjoyment, self-efficacy, and positive affect. Results that are consistent with these occurred in a more recent study that involved experiences staged to engage both competence and relatedness needs (Roark & Ellis, in press). Other studies have identified effective strategies that can be used to stage experiences that elicit target emotional and motivational states (Garbarino, 1975; Koestner, Ryan, Bernieri, & Holt, 1984; Patrick, Skinner, & Connell, 1993), conceptual learning (Grolnick & Ryan, 1987), and pro-environmental behaviors (Legault & Pelletier, 2000; Pelletier & Tuson, 1999). These studies provide compelling evidence that specific techniques may be used to stage encounters that engage the psychological needs of autonomy, competence, and relatedness advanced by self-determination theory (Deci & Ryan, 1985; 2002). By engaging these psychological needs in a natural setting, it may be possible to create
positive associations with nature, which in turn may facilitate positive evaluations of nature.

No studies have been completed, however, that directly address the relationship between valenced intentionality toward nature and autonomy, competence, and relatedness. The activity staging strategies that have been demonstrated to be effective in other recreation and education settings and contexts may be insufficient to create change in participants’ evaluations of the natural environment.

The novelties and complexities of the natural environment may be sufficient, in and of themselves, to affect valenced intentionality toward nature. Edward O. Wilson (1984) proposes that humans possess an innate tendency toward life [nature], which suggests that we do not need to create a sense of value toward nature because it already resides in all of us. Individual and cultural differences also play a role in how emotions are construed (Ortony, Clore, & Collins, 1988). These differences may work against any efforts put forth by instructors in delivering staging strategies. Furthermore, most students attending residential treatment programs are doing so against their will. Parents have enrolled their child and often the child does not want to be there. This may result in a situation of external motivation or even amotivation for the student (Deci & Ryan, 2002). Psychological needs are best met through engagements that are characterized by some degree of intrinsic motivation (Deci & Ryan, 1985; 2002). Activity staging strategies aimed at meeting autonomy, competence, and relatedness needs may thus be insufficient to create identified, integrated, or intrinsic value toward nature in students.

The focus population of this study struggle with a variety of issues such as unresolved trauma, depression, anxiety, oppositional behaviors, impulsivity and attention
difficulties, social and relationship difficulties, substance abuse, identity and developmental difficulties, and academic and learning disabilities. Facilitating satisfaction of the basic psychological needs of autonomy, competence, and relatedness may be too difficult a task for activity-staging strategies given the host of difficulties these students already face. In addition, study participants live, attend school, and undergo therapy together. Participants have already developed group dynamics and social structures that may inhibit or override strategies designed to satisfy the relatedness need. Therefore, the purpose of this study is to examine the effects of activity staging strategies designed to activate and satisfy the basic psychological needs of autonomy, competence, and relatedness on valenced intentionality toward nature in teen-age male students enrolled in a residential treatment program.
CHAPTER II

LITERATURE REVIEW

The purpose of the first section of this literature review is to frame valenced intentionality toward nature as a cognitive judgment or evaluation of nature. Following a brief discussion of the dependent construct is a discussion of the roots of cognition in emotion: the philosophies of Aristotle and the Ancient Stoics, which will give way to an argument for judgments as causal to emotion. Following this, the discussion will go somewhat in depth into one particular cognitive theory, appraisal theory, in an effort to draw a clear picture of a more modern concept of the role of judgment in emotion as well as to illustrate how the concept of judgment relates to this study. Further along I will consider the role of object in emotion and judgment based on three philosophical conceptions. I shall conclude this section with a brief discussion of physiological or bodily changes, affect or feelings, and action tendencies and how they relate to a major assumption of this thesis.

The purpose of the second section of this literature review is to create an argument for staging experiences, shaped by self-determination theory (SDT), as a way to create positive associations with nature and affect an individual’s valenced judgments toward nature. The assumptions and minitheories that comprise self-determination theory
will be outlined. Self-determination theory will be discussed in terms of its relation to emotion, citing specific studies that have used self-determination theory to target positive emotional outcomes. A discussion of staging experiences including specific strategies that were employed to target the desired outcomes will show how self-determination theory can be facilitated in order to meet the psychological needs of autonomy, competence, and relatedness.

Valenced Intentionality Toward Nature

Valenced Intentionality Toward Nature (VITN) is a construct born from another, more complex construct, Emotional Affinity Toward Nature (EATN). Emotional Affinity Toward Nature is a construct that has very little consensus on definition and very little empirical support. The construct has been loosely defined as “a concept embracing various inclinations toward nature such as the love of nature” (Kals, Schumacher, & Montada, 1999, p. 180) and as an attraction to nature embedded in one’s emotions (Tyson, 2004). VITN reflects the cognitive aspect of EATN and is the driving force behind the EATN construct. To understand the VITN construct more clearly one must think of an emotion as consisting of different parts. Cognitive judgments or evaluations (Nussbaum, 2001; Solomon, 1976) fuel and shape emotions. Without a judgment of an object no emotion can occur, that is a judgment is a necessary condition for emotion. Because of their primacy for emotion, judgments or evaluations will be the focus of the present study.

Although there has been much controversy in the emotion literature concerning physiological changes in the body (James & Lange, 1922), bodily manifestations of the
emotion, such as increased heart rate, sweating, blushing, etc, can be considered to be part of an emotion. Action tendencies (McKeon, 1941), which are either actualized or felt tendencies toward action or response, are another salient concept within the emotion literature and can also be thought to be a part of emotion. A brief discussion on physiological manifestations and action tendencies concludes the section on emotion below. Although physiological manifestations and action tendencies are thought to be part of what makes an emotion whole, we are concerned herein with the cognitive judgments which give rise to the physiological manifestations and action tendencies. Inclusion of an in-depth discussion of physiological changes and action tendencies is beyond the scope of the present study.

For the purposes of this study, the dependent construct, VITN, will be focused on the cognitive evaluation aspect of emotion. Valenced intentionality is defined as one's cognitive judgment of her or his personal value of natural settings. By defining VITN in this manner, I am creating a construct within a construct. Ideally the construct VITN will help strengthen the EATN construct and position EATN more solidly within emotion literature, which enjoys much more thought and research behind it, and thus as a construct with more empirical worth.

**Cognitive-Emotion Theories**

Theories and explanations of emotions are wide and varied and an explanation of each is well beyond the scope of this thesis. The term cognitive-emotion theory is, in itself, wide and varied. William Lyons (1980) describes a cognitive theory of emotion as “one that makes some aspect of thought, usually a belief, central to the concept of
emotion and, at least in some cognitive theories, essential to distinguishing the different emotions from one another” (p. 33). The word belief in this statement is pivotal and has different counterparts in other cognitive theories; appraisals (Arnold, 1960; Arnold & Gasson, 1954; Frijda, 1993; Lazarus, 1966, 1991); construals (Ortony, Clore, & Collins, 1988); judgments (Solomon, 1976; 2004); evaluative judgments (Nussbaum, 2001). For clarity’s sake the words belief, appraisal, judgment, and evaluation may be used interchangeably in the common language; however, it is important to note that belief is closely affiliated with knowledge, which is distinct from judgment, and will be used sparingly.

Cognitive theories have at least two concepts in common (among many more), and these two things are the keys to effecting valenced intentionality toward nature: 1) emotions are based on judgments, and 2) emotions are concerned with or directed toward objects. These two concepts are salient throughout the literature on cognitive-emotion theories and also in the philosophy of one of the earliest thinkers on emotion, Aristotle.

Aristotle

Aristotle’s work has had a profound impact on the way in which we think about emotions today. As we shall see below, Aristotle has laid the foundation for the modern conception of cognitive theories of emotion. As in Aristotle, the theories and conceptions of emotions outlined below will be based on, in subtlety varying forms, both cognitions and objects with which the cognitions are concerned.

I begin with a discussion of Aristotle because it was Aristotle who made it possible for us to understand and think about emotions as cognitions. Aristotle’s
contribution was to conceive of emotions in terms of cause and effect, which he embedded in his definitions of specific emotions, and as distinct from bodily sensations and bodily drives (Fortenbaugh, 1975). The cause of an emotional response was a belief or judgment concerning an object. For example, Aristotle, in his Rhetoric, defines fear as “a pain or disturbance due to a mental picture of some destructive or painful evil in the future” (McKeon, 1941, 1382-23). In this example, the emotion, the pain or disturbance, results from the belief that there is a ‘destructive or painful evil’ in store. In Aristotle’s conception, the belief or doxa is the cause of the ‘disturbance or pain’, whereas others, such as William James, conceive of an emotion as the disturbance or pain itself. The object of the emotion in this example is the ‘evil’ that is believed to be in store. For Aristotle, beliefs are necessary for an emotion to occur and similarly “beliefs [necessarily] have objects” (Fortenbaugh, 1975, p. 14). Without an object for the belief to be grounded in or focused on, there can be no emotion. In terms of the definition of valenced intentionality toward nature, nature or natural settings are the object of the belief or judgment.

The major implication for Aristotle’s conception of emotions in terms of affecting valenced intentionality toward nature lies in the notion that because emotions are based in cognition (belief or judgment), and because cognition is thought to be connected with the intellect and with reason, emotions can be changed through appeal to the intellect and reason.

Once Aristotle focused on the cognitive side of emotional response and made clear that an emotion can be altered by argument because beliefs can be altered in this way…for emotions can and should be aroused and allayed throughout an oration by reasoned argument. (Fortenbaugh, 1975, p. 18)
Following the scientific method, which Aristotle applied to his definitions and study of emotion (Fortenbaugh, 1975), this study will attempt to show that one’s valenced intentionality toward nature can be effected by influencing one’s judgments of natural settings.

The key to understanding Aristotle’s view of emotions as being caused by cognition lies in the three basic questions Aristotle poses as criteria for realizing emotion. Aristotle’s example in *Rhetoric* is of anger and he states that to know which emotion a person is experiencing or in order to create a desired emotion in someone it is necessary to know the answer to all three of the following questions: “1) What the state of mind of angry people is; 2) who the people are [or what the object is] with whom they usually get angry; and 3) on what grounds they get angry with them” (McKeon, 1941, 1378a 23-28). In posing these three questions Aristotle is framing emotion as cognitive in that answering or meeting these criteria requires cognitive judgment or evaluation. The angry person needs to hold certain beliefs or make certain judgments in reference to these three questions in order to be angry. Aristotle is not suggesting that general, dispositional beliefs or moods influence the answers to these questions but rather very specific circumstances. Aristotle suggests that the person makes an evaluation about the situation at hand. “For Aristotle does not merely say that the angry person believes that someone has said something or done something, he believes that what he or she has done is to be viewed or evaluated as a slight” (Lyons, 1980, pp.34-35).

Furthermore, inherent in Aristotle’s conception of emotions, especially anger, is the notion of action or impulse. As with the judgment that what someone has done is a slight, Aristotle also views this judgment as a call to actualize revenge. “Anger may be
defined as an impulse, accompanied by pain, to a conspicuous revenge.” (McKeon, 1941, 1378a31-32). Indeed, Aristotle’s main motivation in studying emotion was to be able to effect change in the views of man through reason.

Further support for emotions as cognition lies in Aristotle’s discussion of passion and reason. By passion he means emotion and by reason he means an ability to control the passions. Man’s ability to reason, which is a cognitive process, would suggest that cognition plays a role in emotional response. “The passions can be made to serve reason’s purposes by restraining them from excesses and by directing their energies to ends which reason approves” (Adler, 1952, p.419). In this view emotions are controllable through cognitive processes (reason) and are not merely subject to changes in the physiology, as William James thought, or innate tendencies as Charles Darwin proposed (Adler, 1952). The conflict between the passions and reason is a matter of action: good or bad, right or wrong action. In Aristotle’s view bad or wrong action is a matter of erroneous judgment or ignorance (Adler, 1952). “That a man may act either emotionally or rationally, Aristotle thinks, explains how, under strong emotional influences, a man can do the very opposite of what his reason would tell him is right or good” (Adler, 1952, p.418). Again the notion of judgment or evaluation in a specific situation is central to the concept of emotion. For in both the rational and the emotional action a cognitive function is at the root of that action.

The above discussion on passion and reason strike similar chords with the emotional conceptions of the Ancient Stoics. One of the Stoics’ main beliefs was that, in general, passions or emotions hindered the reason of man and should be eliminated altogether and not merely controlled yet allowed as Aristotle proposes.
The Ancient Stoics

To explain the various intricacies of the vast Stoic conception of emotion is beyond the scope of this thesis. Within this section I will focus on more general accounts which will be sufficient for current purposes. Particularly, the focus will be on the philosophy of the Stoic philosopher Chrysippus. First, however, comes an explanation of some basic conceptions that are the foundations of Stoic philosophy. As a note, the words ‘passion(s)’ and ‘emotion(s)’ are used quite interchangeably in much of the literature and can be assumed to be used interchangeably throughout this section.

Stoic philosophy is based on a profound respect for reason which all humans, above all animals, and regardless of race, ethnic background, wealth, etc., possess (Nussbaum, 1994). Furthermore, reason was seen by the Stoics as a form of divinity that all humans possessed and reason was the only good or right virtue. All other external goods were unnecessary and the basis for false judgments.

There is much discussion surrounding the emotions and their effect upon virtue, logic, and reason. The Stoics believed that the universe, including human life, was directed by destiny, reason, or providence. True happiness then followed from surrendering and conforming one’s will to destiny (Duncan, 1952). Emotions were seen as contrary to reason and control; emotions derailed one from the path of destiny and true happiness or eudaimonia. Eudaimonia is defined as “inclusive of everything that has intrinsic value, everything that is choiceworthy for its own sake” (Nussbaum, 1994, p. 361). For the Stoics, virtue is the only intrinsic good; a life of virtue is a life of eudaimonia. Often in the literature the Stoic sage is described as an ideal or archetype who lives a life concerned with only virtue or reason and is unconcerned with external
objects and occurrences. This life of virtue is a result of the sage eliminating concern for external occurrences and objects from his or her life and thus eliminating the possibility of the passions. Exerting control over emotions in order to follow one’s destiny and to be virtuous meant that a Stoic must eliminate emotion, or at least the actions precipitated by emotion, from their lives. Emotions, unchecked, were seen as a threat to virtue, which was obtained by accepting destiny (Duncan, 1952). The Stoic idea that passions should be completely removed from one’s life necessarily makes the passions controllable in the Stoic view. In turn, the extirpation of emotion makes central the necessity of emotions to be based in cognition and reason. In keeping with the belief that emotions should be eliminated in the best interest of reason, if one could judge, say pain, as indifferent then one can control the emotion and thus maintain a virtuous life according to nature. Nature, in the Stoic view, is synonymous with destiny (Duncan, 1952).

With the Stoic conception of emotions as cognitive judgments, the idea of doxa comes into play in the explanation of emotions. Doxa is viewed by the Stoics as an assumption, opinion or judgment in the active sense (Reesor, 1989). Given that doxa is synonymous with judgment and judgments lead to impulses, and when combined form an emotion, then it is logical that the emotion that directs action is contingent upon the judgment held by the individual. Indeed the idea of emotion as evaluative judgment, belief, or doxa is one of the central propositions of this thesis. Martha Nussbaum provides a summary of this central proposition.

As we have seen, there is in Greek thought about the emotions... an agreement that the emotions are not simply blind surges of affect, stirrings or sensations that are identified, and distinguished from one another, by their felt quality alone. Unlike appetites such as thirst and hunger, they have an important cognitive element: they embody ways of interpreting the world. The feelings that go with the experience of emotion are hooked up with and rest upon beliefs or judgments
that are their basis or ground, in such a way that the emotion as a whole can appropriately be evaluated as true or false, and also as rational or irrational, according to our evaluation of the grounding belief. (Nussbaum, 1994, p. 369)

Chrysippus is of the most salient of Stoic philosophers to think and write about the passions. Chrysippus proposed that emotions were erroneous value judgments (Nussbaum, 1994; Sorabji, 2000). Judgments, for the Stoics in general, are defined as an assent to an appearance (Nussbaum, 1994). This idea is important for understanding judgments as emotions. Simply put an assent is an acceptance of a proposition, the proposition being the appearance. Literally speaking an appearance can be viewed as how something appears to someone. The judgment is made when the person assents to or accepts the appearance as true or false. We call these accounts of emotion cognitive because “Embracing or acknowledging an appearance, committing oneself to it as true, seems to be a task that requires the discriminating power of cognition” (Nussbaum, 1994, p. 374). If judgments were always true there would be no basis for emotion (Nussbaum, 1994). The notion of true and false judgments is based in intrinsic and extrinsic value, respectfully. In the Stoic view, in order for a judgment to be an emotion the judgment must consist of three evaluative parts: 1) the values of the person making the judgment, which is an intrinsic quality; 2) the object the judgment is concerned with must be ascribed a high value which is an extrinsic quality; and 3) the object must be vulnerable to outside forces or out of control of the evaluator which is also an extrinsic quality (Nussbaum, 1994). These three constituent qualities are necessary for an evaluative judgment to be an emotion. Martha Nussbaum (1994) uses a coffee cup as an example to illustrate this point. Would someone have an emotional response to the loss of a coffee mug? Probably not, unless that mug held strong sentimental value for that person. Going
back to reason being the only thing to be concerned with, if that person ceased to hold the coffee mug as extrinsically important and valuable, the loss of said mug would fail to be sufficient to cause an emotional episode. In other words, as a true Stoic sage or ideal, a person would be concerned only with their intrinsic virtue and would not be inclined to judge the mug as an extrinsically important item. That person would be indifferent and therefore would have no emotion.

The critical importance concerning the Stoic notion of emotion lies not in the intricacies of first and second judgments and of good versus bad, although these concepts are important for an in-depth understanding, but in the basic fact that the Stoics conceived of emotions as based in cognitive judgments and not merely uncontrollable, physiologically-based manifestations. This conception served the Stoics in that emotions can be controlled and thus eliminated. In terms of the current thesis, this conception also lends credibility to the hypothesis that emotions can be influenced by intentionally designed programs aimed at influencing value judgments. “Since the belief [or judgment] is the ground of the feeling, the feeling, and therefore the emotion as a whole, can be modified as a modification of belief” (Nussbaum, 1994, pp. 369-370).

The conceptions of Aristotle and the Ancient Stoics have had profound influence on modern cognitive theories of emotion. In the following section appraisal theory will be outlined and explained in terms of its relevance to the current study.

**Appraisal Theory**

Appraisal theory has evolved into one of the most sophisticated cognitive theories of emotion. A brief description of appraisal theory from its beginnings to more recent
studies strongly illustrates the concept of emotion as cognition. In Arnold and Gasson’s (1954) concept emotions differ according to their object. However, it is the cognitive judgment of the situation that actually determines which emotion is manifested. Here we see the influence of Aristotle in a more modern theory of emotion. For Arnold and Gasson (1954), positive emotions are based on suitable or good objects while negative emotions are based on harmful or evil objects. For example love is experienced when the object is judged to be suitable whether the object is present or not, desire or wanting is experienced when the object is judged to be suitable but the object is not present, and joy or delight is experienced when the object is judged suitable and the object is present. These more simple emotions (love, desire, joy) Arnold and Gasson call impulse emotions. Furthermore, emotions such as hope, despair, and fear depend on a second judgment. These are called contending emotions and are more complex than impulse emotions. For example if an object is judged suitable (first judgment) and the object is also judged to be attainable (second judgment) then hope is the emotion. If the object is judged unsuitable or ‘evil’ and it is judged that the object should be avoided fear is the emotion. Cognition is pivotal here as in all cognitive theories of emotion; without the judgment one does not experience emotion, one simply experiences situations.

Again, as we saw with Aristotle, emotion is tied to action; “As soon as the object was judged as it affected the person, there came the tendency away from it which we have called emotion” (Arnold & Gasson, 1954, p. 303). This suggests that emotions are not simply feelings or physiological changes, although emotions may be accompanied by such changes, but also based in action, to actively seeking to possess an object as in desire, to be in the presence of an object as in joy, or conversely, to be away from an
object as in the case of fear. This also shows us that if we can influence a student’s judgment about nature, it is feasible, by a cognitive conception of emotion, that a student’s emotional response toward nature can also be influenced or changed.

In Arnold and Gasson’s terms valenced intentionality toward nature may be defined as a judgment of attraction toward an object, that object being nature. This definition has three key elements; 1) cognition (judgment of attraction), 2) action (toward), and 3) object (nature) which qualifies it as an emotion. However, in order for nature to be judged or evaluated as attractive, nature must have some positive value attached to it. “The intensity of an emotion, then, depends not only on how attractive or repulsive or dangerous we judge this situation [or object] to be, but also on how important [valenced] this attraction is for us.” (Arnold & Gasson, 1954, p.308). Arnold and Gasson are largely credited with starting the modern cognitive-emotion theory movement, especially those theories involving appraisal as the main cognitive element. Their influence and ideas can be seen in more recent conceptions of appraisal theory.

Following from Arnold’s conception of appraisal and emotion Richard Lazarus, in Psychological Stress and the Coping Process (1966), writes about stress and threat in terms of appraisal. For Lazarus (1966) appraisal is “the mechanism by which the interplay between the properties of an individual and those of the situation can be understood...a judgment about the meaning of future significance of a situation based not merely on the stimulus, but on the psychological makeup” (p. 44). Both Arnold and Lazarus view emotion as a process involving appraisals. For Arnold the emotion-eliciting appraisal is called the intuitive appraisal; it is immediate, and it gives rise to action tendencies and physiological changes in the body (Arnold, 1960). This is the cognitively
causal process of emotion and that which constituted an emotion. Reflective judgments, Arnold allowed, were judgments made after the fact of the intuitive appraisal which may alter the previous appraisal and change the character of the emotion experienced. For example, if you were in a darkened room and suddenly saw a shadow pass by on the wall your first or ‘intuitive appraisal’ might be that of a figure that was threatening and the resulting emotion is fear. Upon second thought or ‘reflective appraisal’ you realize that the shadow was your own, and the emotion is then modified because your judgment of the shadow as threatening is adjusted to the shadow as nonthreatening and calm is thus restored. Lazarus (1966) introduces the concepts of primary and secondary appraisal to describe the process in which the full extent of emotions are fully realized. Primary appraisals that are determined by stimulus and personality factors of the individual provide the impetus for the emotion. Secondary appraisals are much like the reflective judgments in Arnold’s conception and underlie and drive the actions an individual takes to deal with the emotion experienced: what Lazarus calls the coping process. “Secondary appraisal is distinguished from primary appraisal by the sources of information which feed it...while primary appraisal is concerned with the impending harm, secondary appraisal is concerned with the consequences of any coping action” (Lazarus, 1966, p. 208). Basically, primary appraisals are a sort of general snap judgment based on previous experience and personality factors that guide the initial emotional response. The secondary appraisal acts as a cognitive director of actions to be taken to deal or ‘cope’ with the emotion elicited by the primary appraisal. The secondary appraisal directs the emotion in that it takes stock of the immediate experience rather than judges it on previous experience alone. This is why the secondary appraisal has the power to change
the emotional response or to ‘cope’ with the emotional response being experienced. Keep in mind that the process of primary and secondary appraisal is very fast and can seem instantaneous at times. Primary appraisals tend to be very quick and are often amended by secondary appraisals which are more reflective in nature, but which can also take place very quickly at times.

Previous experience and knowledge as mentioned above play a role in appraisal. In what Lazarus (1966) calls the stimulus configuration, previous experience, either real or vicarious, can affect the appraisal process. “The nature of the individual’s motivation, experience, and cognitive dispositions interact with the stimulus to produce the particular appraisal of significance of the stimulus” (Lazarus, 1966, p. 88). This has implications for the present study in that if students have had negative experiences with nature in the past, these experiences and what they have learned from them may influence a negative appraisal toward nature no matter what the treatment condition may offer. Conversely, past positive experiences with nature may influence the positive appraisals toward nature which will make it difficult to know if the treatment employed in this study is effective in and of itself. In terms of the immediate experience with which we are concerned in the present study, the stimulus configuration also has profound implications for the experience that we create. If we can create a positive experience concerning nature this experience may influence the appraisal or judgment made toward nature, which is the main proposition of this study. As Lazarus points out:

the notion of appraisal has utility in pointing us toward the empirical conditions that determine [emotion] threat and coping...It does this because it helps us to ask what sorts of information are relevant to the appraisal process...what does this feature or that feature of the stimulus situation signify. (Lazarus, 1966, p. 88)
This will help guide the design of an experience that is targeted at creating positive appraisals of nature. The factors contributing to the stimulus configuration concerning valenced intentionality toward nature are meeting the three psychological needs of autonomy support, competence, and relatedness (discussed below). We are herein concerned only with the situational influence of the independent variable on appraisal or evaluation; we want to affect the immediate judgment concerning nature and not subsequent or future judgments concerning nature, per se.

More recent studies in appraisal theory consider emotions to result or follow from appraisals of events with respect to their implications for well-being or for the satisfaction of goals, motives, or concerns (Frijda, 1993; Lazarus, 1991). This conception is based on and closely aligned with the work of Arnold and Gasson (1954) and Lazarus (1966) described above. In making the shift from appraisals dealing narrowly with stress and threat in 1966 to his more recent work dealing more broadly with emotions in 1991 Lazarus has come to view appraisal as a process.

An evaluation of the significance of what is happening for well-being is not static; once achieved an appraisal does not necessarily remain fixed. Rather, it should be regarded as a tentative and changeable cognitive construction, which emerges and reemerges out of ongoing transactions on the basis of conditions in the environment [stimulus configuration] and within the person [personality factors], and it is more or less subject to modification as conditions and persons change. This is what it means to speak of appraisal as a process. (Lazarus, 1991, p. 138)

Although it has been implicit in previous works on cognition and emotion Lazarus’s conception of appraisal as a process makes explicit the major assumption of this study; that cognitions can be influenced and changed thus allowing emotion to be influenced and changed. Nico Frijda also agrees with this point: “emotions involve attributions,
belief changes, changes in attention and in sensitization for particular classes of stimuli” (1993, p. 371).

In conceptualizing appraisal as a process the ideas of primary and secondary appraisal have become more sophisticated and viewed in terms of well-being as defined above.

[The primary appraisal] addresses whether and how an encounter is relevant to a person’s well-being [and the secondary appraisal] is an evaluation of the person’s options and resources for coping with the situation and future prospects...[and] because secondary appraisal is necessary to define the full adaptational significance of the encounter, it often has crucial influence on which individual emotion is experienced. (Lazarus, 1991, p. 145)

In light of this refinement, much of the recent work in appraisal theory has been done in order to find, describe, and define the specific cognitions that lead to or differentiate specific emotions (Ellsworth & Smith, 1988; Roseman, Spindel, & Jose, 1990; Smith & Ellsworth, 1985; Smith & Lazarus, 1993). This defining of more specific emotions is due in part to the shift in thinking of appraisals as a process. There are many nuances to these new theories and conceptions of specific emotions that go beyond the scope of the present work.

Frijda (1993) makes a case for simple emotion-eliciting events or antecedents. “[T]he specific emotion, in terms of articulate, differentiated behavior, as well as those of self-ascription, results from the ‘primary’, automatic, and relatively simple appraisal” (p. 374). This view is very similar to the idea of primary appraisal described above. Since the construct valenced intentionality toward nature has little research or method describing how to elicit it, the aim of this study is to design one procedure that has utility in inducing simple emotion-eliciting events to affect one’s valenced intentionality toward nature. “The basic process [primary appraisal] is sufficient for emotion arousal and for
instigating elaboration [secondary appraisal]” (Frijda, 1993, p. 382). Changes in action
tendencies rooted in emotion and long-term changes in emotional response to an object
are beyond the scope of this study. However, if we can determine how to effect change in
situational value toward nature we may have some insight into how to elicit and effect
long-term change in valenced intentionality toward nature. This is an implication for
further studies.

One final consideration, that of knowledge, must be addressed here to complete
the picture. Lazarus (1991) discusses two types of knowledge: general knowledge and
situational knowledge. General knowledge can be viewed as knowledge an individual
already possesses as accumulated and assimilated from previous experience. Situational
knowledge is knowledge gleaned from an immediate experience which has not yet been
assimilated into general knowledge. Neither of these cases of knowledge, according to
Lazarus, is an appraisal. They help make up the cognitions on which appraisals are based,
but until the primary and secondary appraisals are made an emotion has not been
actualized. “[M]ere knowledge does not directly result in emotion. Another process
(appraisal) is required, which involves an evaluation of whether and how what is
happening is harmful or beneficial [primary appraisal], and if so, in what way [secondary
appraisal]” (Lazarus, 1991, p. 145). The focus of this study, therefore, will be on
situational knowledge as influenced by the independent variable.

As we have seen in the discussion of appraisal theory, in terms of effecting
valenced intentionality toward nature, it is then not enough to have knowledge, a
judgment, action, and an object. We must also find a way to attach value to the object, in
this case, nature. The discussion that follows describes two philosophers of emotion that
ascribe great importance to the value of the object of emotion. Their concept of emotion as cognition varies in nuance and semantics yet is fundamentally the same as in the conceptualizations described thus far; cognition is a causal agent for emotion.

**Objects of Emotion**

The object of an emotion gives our appraisals, judgments, evaluations direction. Without an object there cannot be an emotion. It is therefore intuitive that the objects of emotions have some varying level of value. Why would an emotional response occur about an object if the person exhibiting the emotion placed no value in the object of the emotion? The concept of object is not new; we have seen its role in the discussions on Aristotle, the Stoics, and in appraisal theory. The following discussion places more emphasis on the importance or value of the object in eliciting judgments.

Martha Nussbaum (2001) argues that “emotions always involve thought of an object combined with thought of the object’s salience or importance” (p. 23). This is an important statement which implicitly states that emotions are the result of cognition (thought of an object) as well as explicitly stating that emotions are focused on an object of some importance to the emotional person. In this conception of emotions the object of the emotion is intrinsically based or valenced. This idea of valenced or intentional object is important for those hoping to create or influence emotion. As in Aristotle’s (McKeon, 1941) concept of anger the action taken by someone had to be viewed not only as a ‘slight’ but as a slight toward something or someone of value (i.e., self, family, friends, etc...).
William Lyons (1980) introduces his conception of formal and particular objects of emotion. His notion of a formal object is of a general category of objects, loosely defined, and evaluative in nature. These objects may be said to be nonexistent, or not tangible or obstensive in nature. Often times the formal object cannot be described or conceived of in the emotional person’s mind. Lyons describes the formal object as the “generalized content” of emotions which is easily confused with the evaluative piece of the emotion. The formal object is the distinguishing criterion between specific emotions such as love and fear. The particular object on the other hand is the direct focus of the emotion. The particular object is necessary for emotion, assuming of course that evaluations lead to emotions; “an evaluation must have a focus or target which is [to be] rated or evaluated” (Lyons, 1980, p. 104). Lyons goes further to say that the term ‘particular’... does not imply that a single or simple item be focused on or that the item be capable of being described in any definite way. The term merely implies that the emotional state is about something rather than nothing. So the particular object of emotions is something which is particular only in the sense that it can be focused on by the evaluation at the centre of some particular emotional state. (Lyons, 1980, pp. 105-106)

Further distinction is given to material and intentional objects. Lyons (1980) views the intentional object as something that once existed but has ceased to be in the world or as living in the mind or of ‘psychological state or activities’. The material object is an object that actually exists or actually has basis in the real world. For Lyons both material and intentional objects have worth or value for the emotional person; indeed they must to be the target of evaluation and therefore emotion. Nussbaum (2001) uses the term intentional object to mean an object of intrinsic worth to the emotional person. She does not make a distinction between material or intentional. Robert Solomon (2004) says that “they [emotions] are about the world...emotions as judgments must accept as their
‘objects’ both propositions and ordinary objects of perception (imagination, memory, etc.)” (p. 82). Solomon’s view seems to be a bit different from the more specific views of Lyons and Nussbaum. However they all share the view that emotions are about something: an object. The main point is that the object of an emotion is valenced and is the focus of the evaluation. One important caveat to the discussion of the object of emotion is that despite all the distinctions between different types of objects (i.e., material vs. intentional) emotions can be based on indescribable objects. Furthermore, just because emotions have an object does not mean that they cannot be false or based on erroneous judgment or evaluation (Lyons, 1980; Nussbaum, 2001; Solomon, 2004).

Physiological Changes, Physical Manifestations, Action Tendencies, and Emotion

A major assumption of the present study is that emotions involve physiological changes and physical manifestations in the body. However, it is beyond the scope of the present study to measure and include such changes and manifestations in the theory presented. The idea of physiological manifestations or bodily changes in emotions was made popular by William James and C.G. Lange (1922). Although their view is largely thought to be incorrect, especially in cognitive circles, it has given rise to much theory and research concerning physical and physiological manifestations of emotions: facial expressions (Eckman, 1975); physiological determinants (Schachter & Singer, 1962); somatic theory (Papanicolaou, 1989). The James-Lange theory, as it has come to be known, proposes that “bodily changes follow directly the perception of the exciting fact, and that our feeling of the same changes as they occur is the emotion” (Lange & James, 1922, p. 13). Many modern cognitive conceptions of emotion take issue with the James-
Lange conceptualization because of this conceptualization. It is important to note however that James and Lange do conceive of the 'perception' or evaluation of an object or situation as causal to an emotion.

More recently the concept of physical manifestations of emotions has found renewed importance in cognitive concepts of emotion. This is not to say that they are thought of as causal to emotion but rather as an integral part of how we gain knowledge of the world around us (Goldie, 2004) and as 'judgments of the body' and how we 'emotionally engage with the world' (Solomon, 2004).

The idea of action tendencies stemming from emotions is as old as Aristotle's conception of emotion and emotional response. Again Aristotle's conception of anger as a slight toward the self or quasi self (friends, family...) includes a tendency of the person feeling the emotion to act upon or react to the person causing the slight. Examples of tendencies toward action as a response to judgments, such as removing oneself or fleeing from an evaluated danger as in fear, coping with stress, running, and movement toward a loved object are abundant in the literature (Arnold, 1960; Arnold & Gasson, 1954; Frijda, 1993; Lazarus, 1966, 1991; Lyons, 1980; Nussbaum, 2001; Smith & Lazarus, 1993; Solomon, 1976, 1988).

For the purpose of this study physiological changes, action tendencies, affect, and/or feelings are assumed to be part of the emotional experience and will not be addressed or measured in the experiment. We turn now to an argument of how we may actually change those appraisals, those judgments, those evaluations that drive the emotion experienced.
Self-Determination Theory

Self-determination Theory, herein referred to as SDT, is a theory of motivation which has a deep theoretical and empirical history and has been applied in many areas; education (Grolnick & Ryan, 1987; Ryan & Grolnick, 1986; Vallerand, Fortier, & Guay, 1997); health care (Ryan, Plant, & O’Malley, 1995; Williams, Freedman, & Deci, 1998; Williams, Grow, Freedman, Ryan, & Deci, 1996), pro-environmental behavior (DeYoung, 1986; Green-Demers, Pelletier, & Menard, 1997), business and management (Baard, Deci, & Ryan, 2000; Deci Connell, & Ryan, 1989), religion (Baard, 1994), among many others. Self-determination theory also has profound implications for affecting emotion (Patrick, Skinner, & Connell, 1993; Reis, Sheldon, Gable, Roscoe, & Ryan, 2000; Sheldon, Ryan, & Reis, 1996). Before we undertake the connections between SDT and emotion, however, I will first outline Self-determination Theory and its tenets.

The basis for and that which forms the major assumption of SDT is that humans actively engage in their environment; they are organismic and have innate needs, which provide energy for humans to act. This is opposed to the view of humans as mechanistic, passive, and driven by physiological and environmental forces (Deci & Ryan, 1985). The concept of intrinsic motivation stems then from the belief that humans are organismic. Intrinsic motivation is rooted in the concept of effectance motivation or the innate propensity to be effective in interactions with the environment (White, 1959). For Ryan, Deci, and Grolnick (1995), intrinsic motivation “represents an autonomous organismic striving and is accompanied by people’s experiencing their actions as emanating from themselves and as having an internal perceived locus of causality” (p.629). Intrinsically
motivated people ideally do things, take actions because they want to, for the pure enjoyment of it and not because they feel externally controlled or coerced to do it.

SDT is a theory of motivation involving the interplay between intrinsic versus extrinsic motivations and the satisfaction of basic psychological needs of autonomy, competence, and relatedness (Deci & Ryan, 1985). These concepts have their roots in earlier theories and conceptions (deCharms, 1968; Harlow, 1958; White, 1959). However the basic needs of autonomy, competence, and relatedness will herein be defined as Deci and Ryan (1985, 2002) have defined them. Autonomy refers to being the perceived origin or source of one’s own behavior. Competence refers to feeling effective in one’s ongoing interactions with the social environment and experiencing opportunities to exercise and express one’s capacities. Relatedness refers to feeling connected with others, to caring for and being cared for by those others, to having a sense of belongingness both with other individuals and with one’s community. According to SDT the social environment can be manipulated and structured in such a way as to foster the satisfaction of these three basic psychological needs.

SDT is comprised of four mini theories, which were all designed, through decades of research, to account for different aspects of motivation. A brief discussion of the four theories follows. Of particular interest to the present study are the components of Organismic Integration Theory and of Basic Needs Theory.

Cognitive Evaluation Theory

Cognitive Evaluation Theory (CET) is based on the concepts of perceived locus of causality (deCharms, 1968) and perceived competence (Deci & Ryan, 1985). When all
three basic psychological needs are met, intrinsic motivation is optimal. However, extrinsic rewards or controls, which oppose autonomy or choice, undermine or thwart intrinsic motivation. This works on the basis of perceived locus of causality (deCharms, 1968), and relates to the need for autonomy (Deci & Ryan, 2002). When perceived locus of causality is high, that is the person perceives themselves (their values, interests, etc.) as the cause or origin of an event or action, intrinsic motivation is bolstered. When perceived locus of causality is low, that is the person perceives themselves (their values, interests, etc.) as not being the origin or cause of an event or action, extrinsic motivation is at work and intrinsic motivation is thwarted. “Tangible rewards, which were typically found to decrease intrinsic motivation, were theorized to have their effect by prompting a shift toward a more external perceived locus of causality for the rewarded activity” (Deci & Ryan, 2002).

Similarly the idea of perceived competence relates to the idea of competence in SDT and works in much the same way, directionally speaking, as perceived locus of causality. When perceived competence is high intrinsic motivation is high and when perceived competence is low intrinsic motivation is thwarted (Deci & Ryan, 2002).

**Organismic Integration Theory**

Organismic Integration Theory (OIT) was conceived in order to answer questions dealing with how people operate motivationally when they are not intrinsically motivated to act. OIT is basically concerned with the concept of internalization: how a person “integrate[s] their ongoing experiences” (Deci & Ryan, 2002, p. 15), or the “means through which someone can become more autonomous in performing an activity that was
initially externally prompted" (Ryan, Deci, & Grolnick, 1995, p. 631). This means that even though a person may not be initially intrinsically motivated toward an action, they have the ability to integrate, to various degrees, extrinsically motivated actions into their value system in order that it may ideally become what Deci and Ryan (2002) call autonomous extrinsically motivated behavior. In OIT the concepts of relatedness, competence, and autonomy are important:

support for feelings of relatedness are, indeed, crucial for promoting internalization. As well, people will need to feel competent with respect to behaviors valued by a significant other [social group, family, etc...] if they are to engage in and accept [integrate or internalize] responsibility for those behaviors...support for autonomy is the critical factor for determining whether the internalization that is promoted by supports for relatedness and competence will be only partial (as in introjection) or will be much fuller (as in integration). (Deci & Ryan, 2002, pp. 19-20)

Introjection is “only partial assimilation in which the internal regulatory process retains essentially the same form it had when it was still external.” (Ryan, Deci, & Grolnick, 1995, p. 632). Identification is viewed as “transitional between introjected and integrated” (Ryan, Deci, & Grolnick, 1995, p. 632) and is when an individual accepts values as their own. Integration “indicates that a value and its accompanying regulatory process have been reciprocally assimilated with all other aspects of one’s self” (Ryan, Deci, & Grolnick, 1995, p. 632). The ideas of internalization, integration, and identification are important for the present study for three reasons: 1) they suggest that change is possible; 2) it may be possible to change one’s emotional outlook on nature (valenced intentionality toward nature) by focusing on integration of externally motivated experiences rather than trying to create purely intrinsically interesting situations, and; 3) identification allows for creating nature as a valenced object in students who might not be intrinsically motivated to value nature. The latter two statements afford some leeway in
creating nature as a valenced object. According to OIT, pure intrinsic motivation is not the only avenue to creating value and that extrinsically motivated activities and/or objects can be integrated or internalized as personally valued (Chandler & Connell, 1987; Koestner, Losier, Vallerand, & Carducci, 1996; Ryan & Connell, 1989; Ryan, Rigby, & King, 1993). Similar ideas are reflected in the following paragraph written about emotion.

If, then, emotion is to be instrumental in self-actuation, the objects of emotion [nature] must be harmonized with the person’s larger goal as a human being [self-determined behavior]...Impulse emotions, therefore, could be identified with the tendency toward possession. The contending emotions or urges, on the other hand, act as means for establishing the self in its possessions, that is, for self-actuation. Contending emotions could be identified with the basic tendencies of the human being toward psychological stabilization (or security) and toward self-actuation. (Arnold & Gasson, 1954, p.306)

In light of this passage it seems that valenced intentionality toward nature best resides in the contending emotion category as we want students to integrate their judgments of nature within their identity, not merely accept nature as a possession.

It is the aim of the present study that the experiment be designed to meet the basic psychological needs of autonomy, competence, and relatedness in a nature setting in order to create a situational valuing of nature. The aim is certainly not to suggest that one experience can cause the integration of values concerning nature and thus affect long-term valenced intentionality toward nature. However, the concept of internalization does suggest that these situational experiences, over time, could lead to an individual who integrates positive judgments of nature into their personal value system. Given enough time and continued positive valuing of nature an individual may ultimately become intrinsically motivated to seek out experiences in nature. Given the situational nature of
this study the experiment is more likely to affect the regulatory process of identification where conscious valuing, acceptance of, and commitment to goals begin (Ryan, Deci, & Grolnick, 1995).

Causality Orientations Theory

Causality Orientations Theory (COT) deals with the classification of different personality aspects or “motivational orientations” as they influence one’s ability to interact within various social contexts (Deci & Ryan, 2002) and relates back to the concepts of amotivation, intrinsic, and extrinsic motivation. The autonomy orientation relates to an individual’s general tendencies toward intrinsic motivation, the controlled orientation relates to tendencies toward external motivation, and the impersonal orientation relates to tendencies toward amotivation (Deci & Ryan, 2002). COT is of little interest to the present study in that it does not measure the individual orientation of each participant. Furthermore the interest of the present study lies in affecting intrinsic and autonomous extrinsic motivation across different orientations not for only one orientation. One caveat for ignoring the orientations for individuals is that some individuals may already be autonomously oriented, which may influence more positive judgments of nature. However, based on intimate knowledge of the study population, it is assumed that the orientations for the participants in this study are of the controlled and impersonal sort.
Basic Needs Theory

Basic Needs Theory deals with the concept of well-being. Ryan and Deci (2001) distinguish between hedonistic well-being concerning pleasure and happiness and eudaimonic well-being concerning psychological well-being and true nature and as distinct from happiness. Waterman (1993) says that eudaimonia occurs when people’s life activities are most congruent or meshing with deeply held values and are holistically or fully engaged. The concept of well-being as eudaimonic is closely aligned with the concept of intrinsic motivation and is therefore the view of well-being held by SDT as well as in the present study. Deci and Ryan talk about the ties between eudaimonic well-being and positive affect;

SDT posits that satisfaction of the basic psychological needs typically fosters SWB [subjective well-being (Diener & Lucas, 1999)] as well as eudaimonic well-being. This results from our belief that being satisfied with one’s life and feeling both relatively more positive affect and less negative affect...do frequently point to psychological wellness. (Deci & Ryan, 2001, p.147)

Positive affect has been used as an indicator or measure of eudaimonic well-being (Reis, Sheldon, Gable, Roscoe, & Ryan, 2000; Sheldon, Ryan, & Reis, 1996). In addition to establishing positive affect as an indicator of well-being, the outcomes of these studies create a tie between SDT and emotion.

Self-Determination Theory and Emotion

Positive affect or positive emotionality was supported in situations where the basic needs of autonomy and competence were satisfied (Sheldon, Ryan, & Reis, 1996). Specifically, people reported having better days, of which positive affect was an indicator, when the psychological needs of autonomy and competence were met.
Additionally, a follow-up study conducted by Reis, Sheldon, Gable, Roscoe, and Ryan (2000) showed a third basic psychological need, relatedness, to also account for more positive affect.

In a study on the impacts of rewards on tutoring James Garbarino (1975) hypothesized that the absence of a reward in a tutoring situation would result in more positive affect or emotion. Results from the experiment support his hypothesis. The absence of reward in this study is aligned with the concept of intrinsic motivation. Without external control or reward contingencies students are more intrinsically interested or motivated. Thus they exhibit more positive affect. Furthermore, the results show a “more positive evaluation of person” (Garbarino, 1975, p. 424) as a result of the no-reward condition. Garbarino’s study lends support to the hypothesis set forth in the present study. If tutoring based on a no-reward system can influence more positive evaluations of the tutor, a program designed to be, in part, autonomy supportive and thus necessarily less reward contingent or extrinsically controlled may be able to influence more positive evaluations of nature.

The link between autonomy support and more positive emotionality is also supported in a study by Patrick, Skinner, and Connell (1993). Patrick et al. hypothesized that greater perceived control and autonomy, and thus greater intrinsic motivation, would result in greater positive affect in children during learning situations. The results confirmed the hypothesis and found that both identified regulation and intrinsic motivation have a positive influence on emotion. Here support is also given for identified regulation (Ryan, Deci, & Grolnick, 1995), a form of highly autonomous yet still extrinsic motivation discussed above, which may also be able to influence a positive
evaluation of nature in the present study. Again, given the nature of the current study participant as well as the situational outcome desired in the present study, identified rather than purely intrinsic motivation may be more feasible to influence.

Fear and Associations with Nature

Fear is an increasingly common emotion associated with natural areas (Bixler & Floyd, 1997; Bixler, Carlisle, Hammitt, & Floyd, 1994; Wohlwill, 1974), and creates a barrier to contact with nature (Louv, 2005). A cognitive aspect of fear has been described as the association of feared objects with places and situations in which they may be encountered (Bixler, Floyd, & Hammitt, 1995). Fears can be learned in a variety and combination of ways: through direct experience, vicariously, and/or through instruction (Bixler & Floyd, 1997). Learned negative associations of nature affect the value judgments that individuals make toward nature. If negative associations and emotions can be learned and influenced, it is intuitive that positive associations and emotions can also be learned and influenced. Numerous studies using SDT to stage experiences in different settings have shown positive associations for: learning (Garbarino, 1975; Patrick et al., 1993), the environment (Legault & Pelletier, 2000; Pelletier & Tuson, 1999), parenting (see Grolnick & Apostoleris, 2002), and alcohol and weight-loss treatment (see Williams, 2002). By staging experiences shaped by SDT, and which take place in a natural setting, we may be able to create positive associations with nature and affect an individual’s valenced judgments toward nature.
Activity-Staging Strategies

Activity-staging strategies are ways of shaping social contexts that influence self-determined behavior. SDT involves, in part, a consideration of the influence of social contexts to self-determined behavior. Furthermore the satisfaction of needs is dependent on social context for realization (Reis, Sheldon, Gable, Roscoe, & Ryan, 2000). In order to influence positive associations an intentionally structured experience is needed. In other words, staging an experience is an intentional way of controlling the social context in a way that facilitates the satisfaction of basic psychological needs rather than a way that might thwart satisfaction of needs.

Numerous studies have been conducted in which the social context has been manipulated with external rewards or controls thus undermining autonomy and intrinsic motivation. For a review see Ryan, Deci, and Grolnick (1995). What this means is that if we can stage an experience that fosters rather than stifles autonomy, competence, and relatedness we may be able to foster internalized or intrinsic value toward nature.

Animation has been described as how an immediate experience is put into motion and how the action is sustained throughout the activity (Rossman & Schlatter, 2000). A study by Long, Ellis, Trunnell, Tatsugawa, and Freeman (2001) found positive relationships between animation strategies and enjoyment, self-efficacy, and creative production. Animation strategies are synonymous with activity-staging activities.

The literature on SDT offers guidance and considerations for staging experiences which factor into satisfying the basic psychological needs of autonomy, competence, and relatedness (a synopsis of techniques to be used in the present study is included in the appendix). Staging an experience that is based more on autonomy and less on external
rewards or controls has been understood for decades to have a greater influence on intrinsic motivation (Deci, 1972; Deci & Ryan, 1985), integrated values (Ryan & Connell, 1989), and positive emotion (Garbiano, 1975; Patrick et al., 1993). In addition, positive, informational feedback has been shown to positively influence intrinsic motivation (Ryan, 1982; Weiner & Mander, 1978).

Outcomes are the driving force for staged experiences; however outcomes can be detrimental to creating positive, intrinsically-based evaluations (Deci & Ryan, 1985). "[S]tructuring the situation in a way that makes an activity instrumental for receiving a desired outcome is a necessary condition for control" (Deci & Ryan, 1985, p. 95). Staging an experience that has no desired outcome is difficult. However the experience can be structured in a way that betrays no desired outcome even though there is an underlying agenda. Additionally, researchers should be careful in how they present the study to the participants. "[W]hen the situation implies that one’s behavior is for someone else’s purposes rather than for one’s own, the situation is likely to be experienced as more controlling" (Deci & Ryan, 1985, p.96).

The concept of control, especially perceived internal locus of causality, is critical for individuals to integrate externally influenced values as their own (Ryan & Connell, 1989). Perceived control is related to and can be created through autonomy support. In the present experiment it was important that the experience was staged in a way that the participants believed that they had some degree of control if they were to identify nature as valuable and to make a positive evaluation. Patrick et al. (1993) suggested and showed empirically that high perceived control and autonomy relate to high positive emotion.
Relatedness is a lesser studied and empirically backed need compared to autonomy and competence, yet it has a strong place in the present conceptions of SDT. Reis et al. (2000) showed relatedness, along with autonomy and competence, to be instrumental to emotional well-being. In the literature on emotional affinity toward nature the idea of relatedness is attached with significant others.

The sharing of experiences with significant others may function as an amplifier of the impact of stays in nature. The communications of feelings and the transference of positive social emotions to the natural environment both may contribute to the emergence of an emotional affinity. (Kals, Schumacher, & Montada, 1999, p. 182)

This suggests that a staged experience targeting valenced intentionality toward nature would do well to have some aspects that meet the need of relatedness. The idea of significant others is not clearly defined, however, and for the purposes of the present study we may take it to mean fellow participants and instructors since the study participants will have already established relationships with both other participants and instructors.

The research cited above provides strong support for the idea that activities or experiences staged intentionally to specifically target the psychological needs of autonomy, competence, and relatedness may be able to influence an individual’s judgment or evaluation of nature and vitality.

In the following chapter, I will outline the specific strategies that will be used in the present study to target and attempt to satisfy the psychological needs of autonomy, competence, and relatedness.
CHAPTER III

METHOD

The purpose of this study was to effect participant’s judgments of nature as a result of a program designed to meet the basic psychological needs of autonomy, competence, and relatedness. This chapter describes the methods used to conduct the investigation. Included are descriptions of the setting, participants, measurement, and procedures.

Setting

The study participants experienced snowshoe outings in the Wasatch Mountains and adjacent natural areas near Salt Lake City, Utah. Specifically, established, well-used hiking trails in both Big Cottonwood Canyon and Mill Creek Canyon as well as established snowshoe-specific trails at the Solitude Nordic Center were used. The trails used in facilitating the snowshoe experience were chosen to meet, as best as possible, the optimal level of challenge for study participants. The length of each trail was also considered in order to fit the optimal ability of study participants as well as for time considerations. Under no circumstance did the treatment and nontreatment groups enter into dangerous or potentially dangerous areas (i.e., avalanche paths).
Participants

Study participants were students enrolled in an all male residential treatment program in Utah (N=21). Study participants were between the ages of 14 and 17. Student and parental consent was obtained prior to student participation in the study. Students are enrolled in the treatment program by their parents for a variety of behavioral, emotional, learning, and dependency issues. Admissions criteria for the program are described as being designed to serve underachieving boys struggling with unresolved trauma, depression, anxiety, oppositional behaviors, impulsivity and attention problems, social problems, diminished self-esteem, substance abuse, difficulties at home, relationship problems, identity and developmental issues, academic deficits, and other comparable difficulties. Contraindications for admission include youth who present with imminently life threatening symptoms, pose a danger to self or others, present a history of chronic substance abuse without a recent intervening period of sobriety, present as physically aggressive, or require extreme physical or medical care.

The average length of stay for students enrolled in the treatment program is 7 to 9 months. However, length of stay is highly flexible and based on the needs and progress of the individual. The program maxim is that every student receives an individualized balance of intense therapy, demanding accredited schooling, and structured therapeutic recreation. The treatment facility and program has been designed to provide a home-like environment and less of an institutional setting. The program is directed by its owners; highly credentialed, licensed clinicians. In addition the program employs full-time licensed therapists who work directly with students to provide and execute individualized and family therapy plans. Each participant is a member of a peer group of students with
whom the individual participates in daily functions such as meals, chores, recreation, and clinical/therapeutic groups. An integrated weekend therapeutic recreation component includes a snowshoeing component during which the present study was executed. Other outdoor recreation activities that occur on separate outings as a part of the recreation program include rock climbing, hiking, camping, backpacking, rafting, and skiing/snowboarding.

Procedure

The study involved winter snowshoe outings. In one of these outings, participants received the treatment condition and on the other outing, they received the nontreatment condition. Three groups of participants completed this two-encounter program. Implementation of treatment was counterbalanced to account for possible order of treatment effects. All outings were day trips lasting approximately 4 to 6 hours. Snowshoeing is a standard part of the recreation program for the students. The only changes that participants experienced dealt with interactions between leaders and the students, and the completion of self-report questionnaires on multiple occasions during each 4 to 6 hour encounter.

The treatment condition consisted of a snowshoe outing staged in line with the tenants of self-determination theory (Deci & Ryan, 1985; 2002). Specifically, involvement of students’ autonomy, competence, and relatedness needs were targeted through specific leadership strategies. Figure 2 below is a diagram outlining the experimental and traditional treatments. Traditional treatment is how the snowshoe outing would normally be facilitated as part of the existing recreation component of the
residential program. The experimental treatment refers to the outing scripted in line with the activity-staging strategies designed for this study.

As part of the treatment condition students were given an opportunity to choose a meaningful or intrinsically motivated activity to do while on the snowshoe outing. Each participant was given roughly 30 minutes to be involved in their chosen activity. Following the meaningful choice activity, participants were given a choice to participate in an environmental education lesson where instructors taught students about different animal tracks and gaits. The students were allowed to find and identify tracks in the snow as they traveled along. The participants were given a meaningful choice opportunity within the environmental education lesson where they were allowed to choose an animal
that they most related to or liked and to create a set of tracks in the snow representing that
animal. They were then given the opportunity to create a scenario or story involving the
tracks. These two opportunities for choice were animated in a way that was designed to
be supportive of each student’s autonomy and intrinsic values. If any student was
unmotivated intrinsically the instructor was taught to encourage the student to participate
with another student or small group of students based on the activity they thought to be
most enjoyable or interesting. By allowing these students some choice in which activities
to participate in as well as creating a small group environment the treatment was designed
to bring the motivation of the student within the identified dimension of extrinsic
motivation.

Competence messages were given in accordance with research within SDT
concerning positive and informational feedback. According to Deci and Ryan (1985),
feedback that is informational as opposed to evaluation-based is more effective in
increasing perceived competence. Instructors were coached to frame feedback concerning
competence in an informational rather than evaluative way. For example: “when the
straps on a snowshoe are tight the shoe won’t fall off as easily” (informational) versus
“you haven’t strapped the snowshoe on tight enough so it won’t stay on well”
(evaluational). The informational statement avoids using “you” and places the focus on
the object (snowshoe) rather than the individual.

An exception to competence messages as evaluational is made for opportunities
for praise. Praise has been shown to be more effective when working with boys than with
girls (Deci & Ryan, 1985). This may be due, in part, to a boy’s desire to prove himself to
himself and others through physical achievement. Since this study is concerned with all
male students it was appropriate to use praise as a form of positive feedback. Even though it is a form of evaluative feedback, it is positive and thus feeds into the perceived competence of the male student (i.e., you are a very strong snowshoer, you did well at getting the snowshoe on, you get up quickly after you fall…). When praising, the attention must necessarily be directed at the person and be positive. For students who were struggling, instructors were coached to try to find opportunities to use praise for things they did well and use informational feedback to alert their attention to things on which they could improve.

To create feelings of relatedness, the individual must feel as though he belongs to a group or social context. Whenever possible students were encouraged to work in smaller groups (i.e., during the choice activity and during animal track making and identifying), unless working in groups went against the autonomous choice of the student. Small groups with no more than three or four students is ideal and may create opportunities for those who are intrinsically motivated in a certain activity to help others who are not intrinsically motivated to identify with and perhaps integrate the values of the activity. Instructors were also asked to facilitate a discussion beforehand which focused on the group as a whole. They were coached to ask questions such as “What do you hope to contribute to the group today?” or “How does it feel to be part of the snowshoeing group?” In addition, a relatedness specific activity was facilitated at the end of each treatment outing. Participants and instructors shared stories, highlights, and favorite moments surrounding the day’s outing while enjoying a soda. The agenda for this activity was to allow the participants to interact as a group and to create a sense of relatedness through reflection of a shared experience.
During nontreatment sessions, the group simply went snowshoeing and received none of the opportunities that occurred during the treatment sessions except for the environmental education lesson. Environmental education lessons were offered during both the treatment and nontreatment outings and were designed and delivered in accordance with the conceptual framework for instruction known as the 5 E’s learning cycle (Trowbridge & Bybee, 1990). The lessons were included in both the treatment and nontreatment outings in order to control for the effects of such lessons on valenced intentionality toward nature and vitality. It may be possible that the inclusion of an environmental education lesson on a snowshoe outing may be sufficient to create in situ valenced intentionality toward nature and vitality. However, this was not a hypothesis considered in the present study. The difference between the environmental education lesson for treatment and nontreatment scenarios lies in the option of choice to participate. In the treatment condition participants were given a choice of whether or not they wanted to participate. In the nontreatment condition a choice was not given. Everyone participated in the environmental education lesson. A table of specific techniques that were used to facilitate the outings is included in Appendix D. A complete script for the experimental encounter is included in Appendix B.

The nontreatment outing was facilitated as per usual program standards. The trip was framed as a snowshoe outing where students would learn how to put on and walk with snowshoes. Although the students were in a group, no efforts to accentuate the fact or to provide opportunities to bond as a group were provided intentionally. Opportunities for meaningful choice or competence messages as scripted for the treatment group were not given.
Study facilitators were trained during a 2 hour training session led by the researcher. Study facilitators were given a formal introduction to self-determination theory and its tenets as well through role-playing designed to practice facilitating meaningful choice, competence messages, and relatedness. The study facilitator training document is included in Appendix E.

**Measurement**

**Valenced Intentionality**

Each participant's valenced intentionality was measured six separate times throughout each of the snowshoe outings (a total of 12 times for both treatment and nontreatment occasions per participant) using the semantic differential technique (Osgood, Suci, & Tannenbaum, 1957). The semantic differential was designed to measure the psychological meaning of concepts. The scale used in the current study was constructed to measure the study participants' judgments of the concept of nature. Osgood, Suci, and Tannenbaum repeatedly refer to each individual scale as a judgment. Because we are concerned in the present study with judgments that constitute, in part, an emotion, the response to each scale question and all question scores as a whole reflect each participant's judgment of nature.

Items 1-8 on the semantic differential scale were derived from evaluative adjective pairs conceptualized by Osgood, Suci, and Tannenbaum, (1957). The evaluation cluster of adjective pairs has been shown to be the most important or strongest (Kerlinger, 1964). Two other dimensions, potency and activity, are strong indicators of meaning. However they are not germane to the present study. Kerlinger (1964) suggests
that studies interested in attitudes or values would most likely use only the evaluation dimension. Because the present study is concerned with the value the participant places on nature, the evaluation dimension was used in choosing adjective pairs that most closely reflected the meaning of valenced intentionality. For example, a participant whose scores are skewed more toward the negative adjectives in each pair can be said to have low or no valenced intentionality toward nature. Those whose scores are skewed more toward the positive adjectives can be said to have valenced intentionality toward nature. Included in Appendix A is an example of the scale. Appendix C includes timelines illustrating the intervals at which the questionnaires were administered during both the treatment and nontreatment snowshoe experiences. One questionnaire was completed at the trailhead, before the activity began, and then the final questionnaire was completed following the relatedness activity, again back at the trailhead. Study facilitators were instructed to administer the remaining questionnaires over the time that participants were actually in the field, according to the timeline provided.

Vitality

The participants were also asked to complete the scales relative to their judgment of their feelings of vitality. Items 9-14 on the scale were derived from the subjective vitality scales (Ryan & Frederick, 1997) and were used to assess the in situ vitality of study participants. Key words from the vitality scale were extracted and used in the semantic differential format to provide consistency in the question format. Vitality was measured because it is an indicator of self-determined behavior and well-being.
Some of the adjective pairs for both valenced intentionality and vitality were reversed at random to account for response bias tendencies (Kerlinger, 1964), where participants may simply mark high or low for each pair because the positive adjective always appeared on the right of the scale. By reversing the order on some of the individual adjective pairs, participants are encouraged to read the questions more carefully. The order reversal was explained to study participants to ensure that they read each question carefully and answered true to their judgment.

The semantic differential has been used in a wide variety of research including emotion research. Two studies by Jack Block (1957) used the semantic differential to measure the meaning of 15 different emotions, both positive and negative, as defined across gender and culture. The results support the position that the semantic differential can be a valid approach to measurement of the meaning component of emotions, and that the approach can be effective in studies that involve comparison of people of different genders and cultures.

A visual analogue scale DeVellis (1991) was constructed using bipolar adjective pairs in order to measure judgments of nature and vitality. The visual analogue format was chosen because it creates a continuum rather than individual responses (such as a Likert-type scale) and provides a much higher degree of sensitivity to the measure. The visual analogue was created by placing a solid 100mm line between each adjective pair. Participants were asked to mark along the line in the place that best represented their judgment of nature and feelings of vitality in that moment. Measurements were taken from left to right along the line to yield a numerical score. Scores for pairs in which the positive adjective was read first (on the left end of the scale) were inverted to yield a high
number for positive responses. Scores for the pairs where the adjective read first (on the left side of the scale) was negative were left as originally measured to provide a low score number. Although the original semantic differentials were conceived and tested as a 7-point scale, the visual analogue provides participants with a wider degree of choice when rating their judgments.

**Manipulation Check**

In an attempt to ensure the most effective facilitation for the study treatment, instructors were asked to reflect on their experience and record specific incidents of facilitation. When possible a staff person acted as a recorder, taking notes on memorable facilitation points of instructors. Instructors explained to participants that the note taking is only to evaluate the instructor leading the activity and not in any way an evaluation of the participants. If participants thought they were being evaluated, this might interfere with the answers they gave on the questionnaires. Following the staged activity, students were asked to reflect on their experiences in journal writing form. These reflections were extremely useful in checking the effectiveness of the facilitation of each instructor.

In addition to recording observable data as a manipulation check, threats to valid inference making have also been addressed and controlled where possible. By controlling for various threats to the most effective facilitation of the treatment we hoped to make more accurate inferences from the data collected. Included in Appendix F is a table of threats to valid inference making which summarizes the threats taken into consideration in the present study, whether they have been controlled, not controlled, or partially controlled, and how they are being controlled or why they cannot be controlled.
Assumptions

1: Causal orientations for study participants are largely either controlled (extrinsically motivated) or impersonal (amotivated) in nature as opposed to autonomous (intrinsically motivated).

2: Humans are organismic rather than mechanistic; they are active beings, and actively seek opportunities to effect their environment.

3: Emotions involve physiological changes and physical manifestations in the body.

Definitions

Valenced intentionality toward nature is one’s cognitive judgment of her or his personal value of nature.

Activity-staging or animation strategy is how an immediate experience is put into motion and how the action is sustained throughout the activity (Rossman & Schlatter, 2000).

Hypothesis

H1: Recreation encounters staged in ways that activate and satisfy psychological needs during a snowshoe experience in natural environments will increase in situ valenced intentionality toward nature.

H2: Recreation encounters staged in ways that activate and satisfy psychological needs during a snowshoe experience in natural environments will increase in situ vitality.
CHAPTER IV

RESULTS

This chapter presents results of the study. The first section includes a summary of the distributions of the two dependent variables. The second section describes results of the hypothesis tests. The chapter concludes with a summary of the results in terms of the purpose statement.

Descriptive Statistics

Table 1 shows distributions for average item scores for both dependent variables. The highest and lowest possible average item scores for both of these measures are 100 and 1, respectively. As can be seen by the means reported, scores were, on average, on the higher or positive end of the continuum. Both distributions had negative skewness. Valenced intentionality was slightly leptokurtic, while vitality was platykurtic.

Table 1. Descriptive Statistics for Valenced Intentionality and Vitality

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Std. Dv.</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valenced Intentional</td>
<td>252</td>
<td>70.77</td>
<td>20.09</td>
<td>-.892</td>
<td>.592</td>
</tr>
<tr>
<td>Vitality</td>
<td>252</td>
<td>62.02</td>
<td>22.27</td>
<td>-.376</td>
<td>-.286</td>
</tr>
</tbody>
</table>
Treatment condition means and standard deviations are reported in Table 2. The largest mean for vitality was during the SDT-staged tour, when that tour was experienced first ($M=73.72$, $SD=17.38$). The lowest mean was also observed under the SDT-staged tour, when that tour occurred after the traditional tour. The identical pattern occurred for valenced intentionality toward nature. When the SDT-staged tour occurred first, the valenced intentionality toward nature mean was $82.02$ ($SD=12.77$), but when the SDT-staged tour was second in treatment order, the lowest treatment condition mean for valenced intentionality toward nature was observed, $64.56$ ($SD=22.17$). The smallest standard deviations for both vitality and valenced intentionality for nature ($SD=17.38$ and 12.77, respectively) were observed when that the STD-staged tour was experienced first in the treatment order. Thus, the SDT-staged condition, when experienced by students first produced the highest means and the smallest standard deviations among the treatment conditions.

Also notable among the descriptive statistics is the similarity of marginal (main effect) means associated with STD-staged tours versus traditional tours. For vitality, the means differed by only 1.82 units (62.93 minus 61.11), and for valenced intentionality toward nature, the means differed by only .79 units (71.17 minus 70.38). In both cases, the traditional tour mean was very slightly greater than the SDT-staged tour mean.

Overall, the patterns of means suggest an interaction effect. The SDT-staged tours produced the highest means, but only when those tours were experienced first. When experienced second in the treatment order, the SDT-staged tours produced notably low scores on both vitality and valenced intentionality toward nature.
Table 2. Treatment Condition Means and Standard Deviations

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>N</th>
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</thead>
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<tr>
<td><strong>Vitality</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>SDT-Staged Tour (Marginal)</td>
<td>61.11</td>
<td>23.06</td>
<td>126</td>
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<tr>
<td>SDT Tour First</td>
<td>73.72</td>
<td>17.38</td>
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</tr>
<tr>
<td>Traditional Tour First</td>
<td>54.80</td>
<td>23.03</td>
<td>84</td>
</tr>
<tr>
<td>Traditional Tour (Marginal)</td>
<td>62.93</td>
<td>21.50</td>
<td>126</td>
</tr>
<tr>
<td>SDT Tour First</td>
<td>69.01</td>
<td>22.88</td>
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<tr>
<td>Traditional Tour First</td>
<td>59.89</td>
<td>20.24</td>
<td>84</td>
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<tr>
<td><strong>Treatment Order Main Effects</strong></td>
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<td></td>
</tr>
<tr>
<td>SDT Tour First</td>
<td>71.36</td>
<td>20.34</td>
<td>84</td>
</tr>
<tr>
<td>Traditional Tour First</td>
<td>57.35</td>
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<td>168</td>
</tr>
<tr>
<td><strong>Valenced Intentionality Toward Nature</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SDT-Staged Tour (Marginal)</td>
<td>70.38</td>
<td>21.17</td>
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<td>SDT Tour First</td>
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<td><strong>Treatment Order Main Effect</strong></td>
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<td>SDT Tour First</td>
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<tr>
<td>Traditional Tour First</td>
<td>66.27</td>
<td>21.09</td>
<td>168</td>
</tr>
</tbody>
</table>
Hypothesis Tests

Treatment by Treatment Order

Tables 3 and 4 provide summaries of the hypothesis tests for each of the variables. The cross-level interaction effect was found to be significant for both vitality ($t_{248}=2.18, p=.03$) and valenced intentionality toward nature ($t_{248}=2.05, p=.041$). The tables also show a reduction in error variance of the alternative versus the null model ($R^2_{PRE}$) of 8% for vitality and 9% for valenced intentionality toward nature. Intraclass correlations reveal that 43% of the variance in vitality was associated with individual differences among students. For valenced intentionality toward nature, 49% of the variance was attributable to individual differences among students.

Plots (Figure 3) were constructed to facilitate interpretation of the significant interaction effects. Both interactions were found to be disordinal. For SDT-staged tours, the means of both dependent variables were high, but only for the group that experienced the STD-staged tour first. The mean of the SDT-staged tour dropped dramatically for the two groups who experienced the SDT-staged tour on the week following the traditional tour. For the traditional tour conditions, the mean was highest when the SDT-staged tours were conducted first. When the traditional tours were conducted after the SDT-staged tours, the means dropped, but were higher than the means of the STD-staged tours that were experienced second in treatment order.
**Table 3.** Hypothesis Test: Valenced Intentionality Toward Nature

<table>
<thead>
<tr>
<th></th>
<th>Coef</th>
<th>SE</th>
<th>df</th>
<th>t</th>
<th>p</th>
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<tr>
<td>For Intercept 1 ($\pi_0$)</td>
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<tr>
<td>Intercept 2 ($\beta_{00}$)</td>
<td>79.77</td>
<td>5.14</td>
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<tr>
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<td>6.30</td>
<td>19</td>
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<td>.045</td>
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<td>For Treatment (Staging Technique, $\pi_i$)</td>
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<tr>
<td>Intercept 2 ($\beta_{10}$)</td>
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<td>248</td>
<td>-1.42</td>
<td>.156</td>
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<tr>
<td>Treatment Order ($\beta_{11}$)</td>
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<td>3.87</td>
<td>248</td>
<td>2.05</td>
<td>.041</td>
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<tr>
<td><strong>Var</strong></td>
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<td></td>
<td>12.95</td>
<td>167.75</td>
<td>19</td>
<td>201.60</td>
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<td>14.47</td>
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<td>$R^2_{PRE} = .09$</td>
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<td>Null model intraclass $r = .49$</td>
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Table 4. Hypothesis Test: Vitality

<table>
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<th>t</th>
<th>p</th>
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</tr>
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<td>-14.02</td>
<td>6.67</td>
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<td>-2.10</td>
<td>.049</td>
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<td>-4.71</td>
<td>3.67</td>
<td>248</td>
<td>-1.29</td>
<td>.200</td>
</tr>
<tr>
<td>9.81</td>
<td>4.49</td>
<td>248</td>
<td>2.18</td>
<td>.030</td>
</tr>
</tbody>
</table>

Vitality

Fixed Effects

For Intercept 1 (π₀)
- Intercept 2 (β₀₀)
  - Coef: 71.37, SE: 5.44, df: 19, t: 13.11, p: <.001
- Treatment Order (β₀₁)

For Treatment (Staging Technique, π₁)
- Intercept 2 (β₁₀)
  - Coef: -4.71, SE: 3.67, df: 248, t: -1.29, p: .200
- Treatment Order (β₁₁)

Random Effects

<table>
<thead>
<tr>
<th>Var</th>
<th>SD</th>
<th>Comp df</th>
<th>χ²</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>R₀</td>
<td>13.56</td>
<td>183.85</td>
<td>19</td>
<td>167.54</td>
</tr>
<tr>
<td>r²</td>
<td>16.80</td>
<td>282.19</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Null model intraclass r = .43
Figure 2. Treatment (tour type) by treatment order (SDT-staged vs. traditional first) interactions

Effect of Select Strategy-Staging Mechanisms

Table 5 illustrates results of tests of the effects of select strategy-staging mechanisms specifically, time relative to the choice activity, the environmental education lesson, and the relatedness activity. The effect of each mechanism was tested for both dependent variables (valenced intentionality and vitality). Hierarchical linear modeling (HLM) was used to calculate t-ratios, p values, and $R^2$ change values for each dependent variable.

As can be seen from review of Table 5, all six null hypotheses were rejected; all three activity staging techniques (environmental education lesson, choice activity, and relatedness activity) significantly elevated scores on both valenced intentionality and vitality. The effect of the relatedness activity shows the largest mean difference on valenced intentionality (8.76 mean increase). Further examination of the means suggests that both the effects of the environmental education lesson (8.27 mean increase) and the relatedness activity (8.25 mean increase) have the largest influence on vitality. The mean differences for the effect of environmental education lesson are significant for both
valenced intentionality (8.57) and vitality (8.27). Choice is one of the main tenets of self-determination theory. Surprisingly, mean differences are lowest for both dependent variables concerning the effect of choice activity (valenced intentionality =7.41, vitality=6.54).

In addition to mean differences, $R^2$ change values are also reported in Table 5 as measures of effect size. Those values connected with time relative to the environmental education lesson, choice activity, and relatedness activity consistently suggest weak association strength. The largest value is .04 and the smallest approaches zero (<.01).

**Scale Reliability Tests**

Table 6 presents scale statistics for reliability tests performed on the scale items. Reliability tests of the measurement scale produced a Cronbach’s Alpha of .950 for the valenced intentionality measures and a Cronbach’s Alpha of .910 for the vitality measures.

Tables 7 and 8 present the corrected item-total correlations for items used to measure valenced intentionality and vitality, respectively. For the valenced intentionality scale items the positive-negative item was most reliable (.889) and the Uncomfortable-Comfortable item was least reliable (.715). The vitality measures are slightly less reliable than those for valenced intentionality yet are still strong with the Lifeless-Spirited item the highest (.821) and the Tired-Energetic item lowest (.680). Overall, the scale items are strong as a measure of the dependent variables.
Table 5. Mean(Standard Deviation), $t$-ratios($p$ value), and $R^2$ Change Scores for Valenced Intentionality and Vitality

| Time Relative to EE Lesson | Valenced Intentionality | Vitality |  |
|---------------------------|-------------------------|----------|
| Before EE Lesson          | 3.62(0.01)              | 3.94(<.001) |
| After EE Lesson           | 66.94(21.09)            | 57.20(23.75) |
| Mean Difference           | 8.57                    | 8.27     |
| Time Relative to Choice Activity | 3.51(0.01)              | 2.67(.009) |
| Before Choice Activity    | 68.51(20.99)            | 60.02(23.46) |
| After Choice Activity     | 75.92(16.88)            | 66.56(18.65) |
| Mean Difference           | 7.41                    | 6.54     |
| Time Relative to Relatedness Activity | 2.68(.008)              | 2.40(.017) |
| Before Relatedness Activity | 70.04(20.22)            | 61.33(22.46) |
| After Relatedness Activity | 78.80(16.99)            | 69.58(18.90) |
| Mean Difference           | 8.76                    | 8.25     |

*All $t$ ratios for time relative variables have 250 degrees of freedom*
Table 6. Scale Statistics for Dependent Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Variance</th>
<th>Std. Deviation</th>
<th>No. of Items</th>
<th>Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valenced Intentionality</td>
<td>566.19</td>
<td>25832.03</td>
<td>160.72</td>
<td>8</td>
<td>.950</td>
</tr>
<tr>
<td>Vitality</td>
<td>372.12</td>
<td>17851.21</td>
<td>133.61</td>
<td>6</td>
<td>.910</td>
</tr>
</tbody>
</table>

Table 7. Corrected Item-Total Correlations for Valenced Intentionality Scale Items

<table>
<thead>
<tr>
<th>Scale Item</th>
<th>Corrected Item-Total Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good-Bad</td>
<td>.846</td>
</tr>
<tr>
<td>Beautiful-Ugly</td>
<td>.797</td>
</tr>
<tr>
<td>Uncomfortable-Comfortable</td>
<td>.715</td>
</tr>
<tr>
<td>Meaningful-Meaningless</td>
<td>.830</td>
</tr>
<tr>
<td>Unimportant-Important</td>
<td>.847</td>
</tr>
<tr>
<td>Repelling-Attracting</td>
<td>.865</td>
</tr>
<tr>
<td>Positive-Negative</td>
<td>.889</td>
</tr>
<tr>
<td>Appealing-Offensive</td>
<td>.781</td>
</tr>
</tbody>
</table>

Table 8. Corrected Item-Total Correlations for Vitality Scale Items

<table>
<thead>
<tr>
<th>Scale Item</th>
<th>Corrected Item-Total Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alive-Bored to Death</td>
<td>.772</td>
</tr>
<tr>
<td>Important-Unimportant</td>
<td>.722</td>
</tr>
<tr>
<td>Tired-Energetic</td>
<td>.680</td>
</tr>
<tr>
<td>Lifeless-Spirited</td>
<td>.821</td>
</tr>
<tr>
<td>Alert-Sluggish</td>
<td>.818</td>
</tr>
<tr>
<td>Asleep-Awake</td>
<td>.700</td>
</tr>
</tbody>
</table>
Results of Qualitative Data Analysis

Thematic reduction was used to interpret the qualitative data collected in this study. Each participant was asked to reflect, in writing, upon his experiences after each snowshoe outing. The result was qualitative data, which allows us a more personal picture of the participants’ experiences. Following is a report of the most salient themes that were drawn from the thematic reduction of reflection journals written by participants.

In terms of the treatment activities (choice activity, environmental education lesson, and relatedness activity) the journal entries were positive overall and tell us that the activity-staging strategies involving these types of activities were influential in creating participant enjoyment and meaning. In the following paragraphs “Tx” means treatment condition and “NTx” means nontreatment condition.

Several quotes reflect the benefit of the choice activity. One participant compares his nontreatment and treatment condition experiences: “Last weekend’s hike [non Tx] sucked... everyone was complaining and my mood was down. The best parts for me [during the Tx] were the great scenery, and the fact that I had a choice at one point of what I wanted to do. It [Tx] was overall a better experience.” Another participant chose photography as his choice activity: “The funnest [sic] thing about today [Tx] was walking around and taking pictures. I felt confident and satisfied after and during my picture taking.” These quotes suggest that participants have more meaningful experiences when they have choice within the outing. One participant comments specifically about his feeling of autonomy support: “The second time [Tx] it went smoother because we actually had a say in what we did or how we did it.”
Comments about the environmental education lesson were overwhelmingly positive for both the treatment and nontreatment conditions. “I think today [Tx] kind of sucked until we started following animal trails.” “I enjoyed learning about animal tracks and was engaged.” Another participant, after participating in the nontreatment condition wrote: “One of my favorite parts of the day was talking about adaptation...the information given to us seemed thought out and valuable. What was just as cool was being able to apply what we learned by searching for burrows.” “When we were given a presentation of our surroundings [environmental education lesson] it heightened the experience.”

Comments concerning the relatedness activity were less salient than the choice activity and environmental education lesson however, those who did comment on the experience found it positive: “I also thought it was great how we all got to...talk about our day and our memories.”

A review of all reflection journals reveals that many participants thought that the treatment condition was more enjoyable and meaningful than the nontreatment condition. One participant said about his treatment condition experience: “I felt like there was a purpose to the hike instead of hiking ‘just because’.” “Last weekend [Tx] had a point: to get to a destination and do something we enjoyed [choice activity]. Today [NTx] was hiking just to hike, which is a lot less exciting, enjoyable, and meaningful.” Another participant wrote: “It [Tx] was definitely a different and better experience than last week” [NTx]. Several more participants wrote: “Overall, today [Tx] was better than last time” [NTx]. “It [Tx] was overall a better experience.” “I liked this weekend [Tx] more because
there was more free time” [choice activity]. “In comparison to last week [NTx] I thought
more choice and more individual time away from constant snowshoeing was fun.”

Several secondary themes outside of the focus of the treatment activities surfaced
in the reflection journals. Of the most salient of the secondary themes was the change in
attitude for many students from reluctance or negativity to having fun and a positive
attitude. One participant betrays his feelings: “Today [NTx] I wasn’t excited to go
snowshoeing, I do think it turned out to be fun.” Another participant: “When we first
started to hike I was pretty shutdown and negative...I eventually was out of that negative
state and was starting to enjoy it more by lunchtime.” More reflections support the theme:
“I was pretty un-motivated as to going from the beginning. I thought it was kind of cool
once we started, but about 25 minutes in I started to get bored...Overall, I think it was a
pretty good experience for me to have.” “During this activity I was a little skeptical of the
idea of snowshoeing. Then when I got there the mood lifted with the beautiful snow.” “In
the beginning of the hike I was scared...however, I enjoyed the hike and felt
accomplished in the end.” The majority of these responses were taken from reflection
journals from participants who experienced the non-treatment condition first. In
comparison, within the responses from the same groups following the treatment condition
there was little mention of negative associations with snowshoeing.

Trail difficulty and length, scenery, weather conditions, and snow conditions
appeared as a minor themes throughout the reflection journal analysis. The reactions to
the elements were both positive and negative. One particularly negative participant
remarked: “I liked the scenery better than a plain, boring trail...I liked that it was
snowing, that always puts me in a good mood.” A couple of participants remarked that
they were more comfortable when it was colder: “I liked the landscape a lot more [last week] but was more comfortable [this week] because of the cold. Also it was on flat terrain and that made it more enjoyable.” “My favorite thing about snowshoeing is walking up steep hills with a lot of snow on them.” Many participants enjoyed the deeper snow that had recently fallen before and that continued to fall during their outing: “This week [Tx] it was a snowing wonderland. Everywhere was fresh pow[der]. Everyone in my group had a positive attitude while hiking. I personally was in high spirits today. I jumped in the snow playing...it was freaking awesome.” The difficulty of terrain and/or deeper snow conditions, which makes it more difficult and strenuous to walk, may have played a part in skewing the scores on the ‘Tired-Energetic’ item on the vitality scale which has a significantly lower Corrected Item-Total Correlation (.680) of any measure on the scale. Several quotes illustrate this point: “I had not sweated and been that exhausted in quite a long time. I was a lot more exhausted after today...after a long uphill section.”

Participant reflection journals allowed the researcher some insight into what the participants liked or disliked how they felt before, during, and after the outings, their thoughts about the specific activity-staging strategies, as well as individual reactions to weather conditions and trail difficulty. The results of the qualitative data analysis are consistent with findings from the quantitative data analysis and help support the use of activity-staging strategies in such outdoor or natural settings. These insights can be particularly useful for practitioners aiming to design activity-staging strategies for future outings and programs for similar populations.
Summary of Results

A significant interaction effect was found for the order of treatment variable. The treatment outings produced the highest means, but only when the treatment outings were experienced first. When treatment outings were experienced second in the treatment order, the treatment outings produced notably low scores on both vitality and valenced intentionality toward nature. Results of mean differences and change scores for the effects of time related variables are not overwhelmingly large however, mean scores reported for all hypotheses tests do show increases and infer an effect of the activity-staging strategies on the dependent variables.

Results from the analysis of the qualitative data are consistent with the quantitative results. In general, the reflection journal reports from participants following the nontreatment condition are less positive: focused on difficulty of hiking, boredom, and apprehension surrounding going snowshoeing. Conversely, reflection journal reports from participants following the treatment condition are more positive: focused on nature, scenery, feelings of autonomy, and relatedness.

As a note, efforts to measure the competence strategy were difficult because implementation of all treatment conditions included various degrees of competence messages. In other words, the competence messages were not isolated in a single activity as were the choice and relatedness activities. As a result, no measure of the competence strategy was included in the data analysis.
CHAPTER V

DISCUSSION

This chapter begins with a summary of the results in relation to the purpose statement of the study. Following is a discussion of limitations and how the qualitative data support these. A synthesis and integration with existing research includes discussion on how the activity-staging strategies and results of the current study support research involving SDT and pro-environmental behavior and vitality. Directions for future research and implications for practice conclude the chapter.

Summary of Results in Relation to the Purpose Statement

The purpose of this study was to examine the effects of activity staging strategies designed to activate and satisfy the basic psychological needs of autonomy, competence, and relatedness on valenced intentionality toward nature and vitality among teen-age male students enrolled in a residential treatment program. Results revealed a significant treatment-by-treatment order effect as well as for effects of all three activity staging techniques (environmental education lesson, choice activity, and relatedness activity). As for the interaction effect, participants who received the SDT-staged tours first reported high degrees of both valenced intentionality and vitality, but when participants received...
that tour type as the second snowshoe experience, scores were quite low. The three specific activity-staging strategies significantly elevated scores on both valenced intentionality and vitality. Analysis of qualitative data lends support to the hypotheses. Many of the journal entries tell us that overall, participants thought that the treatment condition was a more positive, meaningful experience than the nontreatment condition. The limitation section that follows discusses factors that may have limited the effect size of the treatment applied in this study as well as some true limitations of the study design and implementation.

**Limitations**

**Limiting Factors of Effect Size**

The nature and circumstance of the participants provided difficulty to the interpretation of effect sizes that were estimated through the study. Participants struggle with a host of behavioral, emotional, and learning difficulties, which can influence the way in which they may answer the survey questions at any time. Attitude, mood, beliefs, ability, and behavior can change at any given moment. One participant’s entry in his reflection journal reflects this limitation: “The first minutes were frustrating because I was already mad.”

Ortony, Clore, and Collins (1988) have suggested that emotions can be affected by cultural and/or individual differences. For instance one participant was not used to snow because he had grown up in a desert environment; he was not having an enjoyable, meaningful experience while snowshoeing.
Furthermore, participants are enrolled in the program by their parents and not of their own will, which may create a barrier to feelings of autonomous choice in a grander sense. In other words as a matter of normal program standards the students are not given a choice in whether they want to participate in snowshoeing or not, which for most goes against their intrinsic interest and feelings of autonomy.

The novelties and variable weather and conditions of the natural environment, although not limitations of the study design itself, may have influenced the participants’ judgments of valenced intentionality and vitality. For example, a secondary theme which emerged from qualitative data analysis was factors of weather (snowing, temperature) and terrain (strenuous or easy) which made some participants uncomfortable and others happy: “I liked the second time [Tx] more because it was a more mellow hike. I liked that it was snowing, that always puts me in a good mood.” Weather may have also influenced the patience and accuracy with which participants completed questionnaires. During some outings it was snowing heavily and pens were not working well on the wet paper. Several comments were also made about the lack of snow during some outings; some participants thought it was pointless to use snowshoes to walk on snow that was not deep. Others wanted to go off trail in areas where the terrain was not suitable for such an undertaking. These perceptions and limitations of nature may have influenced judgments made on the questionnaires.

Limitations of the Study Design and Implementation

Measuring the effect of competence messages designed to target and satisfy the competence need was difficult because it was facilitated continuously throughout the
outing. The effect of competence messages was not measured before and after as were the autonomy support and relatedness activities. The effect of competence messages designed to target the psychological need of competence on the dependent variables is unknown; competence messages may or may not have affected the questionnaire responses.

Leader training was limited due to time and availability constraints. More training on facilitation aspects may have allowed facilitators to be more consistent in delivery of the treatment and nontreatment conditions. Leader styles and level of leader involvement may have played a role in how the experiences were construed by participants. One of the leaders improvised some secondary, nonscripted choice activities such as allowing participants to choose the trail direction and to lead the hike. These spontaneous instances of choice work well to help build feelings of autonomy; “last week [NTx] was good but this week [Tx] was better because I lead more hikes...”. However, these extra choice opportunities were not consistent with the script and thus were not followed by all other leaders. They may account for some higher scores due to greater feelings of autonomy within the particular group that received the additional choice activities.

Previously intact groups of participants may have influenced the outcomes of participants’ experiences. Participants went on both the treatment and nontreatment outings with a group that they were already intimately familiar with. This may have skewed the feelings of relatedness and worked over or against efforts made by leaders to facilitate feelings of relatedness. Several of the participants’ reflection journal entries speak to this concern: “At one point a student refused to hike and I felt frustrated because I wanted to keep hiking. I could feel the groups’ morale, it brought us down. Finally he
gave in and we kept going. I don’t know why but I was more motivated to keep going after this. Another entry: “...I was already mad and didn’t want to hike. After that I noticed the group was having fun and I jumped into it as well...everything was wonderful for me until my group started to struggle.” A final entry: “…also nobody was complaining about it [the outing] so it was wicked fun.” Several participants also reflected about experiences with peers during the outing which also speaks to the influence of the previously intact group: “I connected with just about every student. I was spending a lot of the time bonding with a couple of the other students.” These bonds and experiences are important for creating feelings of relatedness but may have been created outside the influence of the activity-staging strategies.

**Synthesis and Integration With Previous Research**

No research in the field of Self-Determination Theory (SDT) has specifically involved the study of judgments of nature. However, studies in SDT have supported the efficacy of programs and strategies designed to influence pro-environmental behaviors (DeYoung, 1986; Green-Demers, Pelletier, & Menard, 1997). Efforts aimed at promoting pro-environmental behaviors also use programs or strategies to influence the outcome.

Most of the research has focused on two types of solutions or ways to encourage pro-environmental behaviors: (a) the use of programs of education, which attempt to encourage pro-environmental behaviors by giving people knowledge and by trying to change their attitudes about the environment; and (b) the use of government laws, behavioral intervention strategies, and incentives to encourage pro-environmental behaviors and discourage damaging behaviors. (Pelletier, 2002, p. 207)

The two constructs, valenced intentionality toward nature and pro-environmental behavior can be related; one could make the connection that pro-environmental behaviors
logically extend from positive judgments of nature. Strategies designed to target autonomy, competence, and relatedness may be adopted and integrated into existing education programs aimed at encouraging pro-environmental behaviors. Currently, competence is, according to research, the only one of the three psychological needs targeted by pro-environmental behavior efforts. “[P]eople must know what behaviors are important and feel competent to manifest these behaviors” (Pelletier, 2002, p. 208). Is it enough that current strategies focus on the seriousness of the environmental problem and the actions necessary to solve them. What if feelings of autonomy and relatedness were also targeted by pro-environmental efforts? The current study shows support for autonomy and relatedness related to effecting positive judgments of nature. As suggested by the emotion literature (McKeon, 1941; Nussbaum, 2001; Solomon, 2004) a judgment is the catalyst for such action.

Matthias Finger (1994) calls for an alternative conceptual framework for how to effect change in environmental behavior. Finger says that traditional frameworks which focus on education and raising awareness are ineffective and outdated. Finger’s framework, in part, involves environmental life-experiences as they relate to environmental world-views and environmental learning. “Significant life-experiences shape one’s worldview and behavior...” (Finger, 1994, p. 144). The activity-staging strategies employed in the current study are one way of influencing environmentally or nature positive experiences. In line with Finger’s conception autonomy supportive, competence building, and relatedness experiences will help shape environmental life-experiences and drive behavior, specifically pro-environmental behavior.
Although the present study is concerned with influencing only in situ judgments of nature, the support for activity-staging strategies gained through this research can help facilitators design programs and strategies that may influence long-term, integrated judgments and emotional tendencies toward nature, which in turn may, in the long run, influence pro-environmental behavior.

Vitality, as a part of well-being, is the outcome when the psychological needs of autonomy, competence, and relatedness are met (Ryan & Deci, 2004). Furthermore, Deci and Ryan (1991) conceive that the elements of a situation or experience that facilitate autonomy, competence, and relatedness enhance vitality and well-being. The increases in feelings of vitality as shown in the current study are consistent with this and other SDT literature and support the activity-staging strategies employed in the current study. Again, the current study results are consistent with the tenets of SDT and existing research (Reis et al., 2000; Sheldon et al., 1996) which says that the satisfaction of the basic psychological needs of autonomy, competence, and relatedness result in psychological well-being of which vitality is a part.

Implications and Directions for Practice and Future Research

Future activity-staging strategies designed to target autonomy, competence, and relatedness would be strengthened by stricter adherence to a script or strategy. As mentioned above, extra-curricular opportunities for choice may have skewed responses. More comprehensive leader training is one way to mitigate this limitation. Leaders should be given opportunity to role-play and practice in the field, the delivery of activity-staging strategies. A feedback process could be facilitated as a way to help each leader to
strengthen their delivery. For practitioners, the activity-staging strategies employed in this research can be used as a guide or model for similar recreation outings and programs.

Using groups of participants who have little or no previous experience with each other may be a way to isolate the efficacy of the relatedness strategy. Mixing students at random or combining small groups taken from larger groups into a new, previously unattached group may be a solution. Relatedness strategies may work well with groups in college orientation programs, where previous interaction and experience is minimal. Future studies should examine the efficacy of activity-staging strategies on different and varied populations.

Creating a method to isolate and measure the competence strategy in future studies would provide insight on the efficacy of competence messages in creating feelings of valenced intentionality. Creating a specific time for informational feedback and praise followed by a questionnaire may be one effective solution. Adjective pairs within the survey related to judgments of competence would provide a measure of competence-staging strategies.

Leaders should take care to match the difficulty of terrain with the ability level of the group and/or individual. Optimal challenge or experience (Csikszentmihalyi, 1975) can play a roll in the perceptions that participants have about their ability. Csikszentmihalyi’s Flow theory (1975) outlines different states of challenge which, depending on perceived competence, creates perceptions of anxiety if challenge exceeds perceived ability or boredom if perceived ability exceeds the challenge. The optimal experience or “flow” occurs when perceived competence and ability are more or less equal. Leaders trying to facilitate positive judgments of nature and vitality may thwart
their own efforts if participants perceive the challenge to be either above or below their perceived ability.

**Conclusion**

The purpose of this study was to examine the effects of activity staging strategies designed to activate and satisfy the basic psychological needs of autonomy, competence, and relatedness on valenced intentionality toward nature in teen-age male students enrolled in a residential treatment program. Results supported the purpose and lend support to Self-Determination Theory as applied to the area of emotion, judgment, and nature, a previously unexplored area for the theory. Participant journals also show support for activity-staging strategies and SDT in creating meaningful experiences. Analysis of both quantitative and qualitative data show increases in in-situ valenced intentionality toward nature and vitality.

Future studies applying activity-staging activities in outdoor education and natural settings can help leaders and researchers understand the complexities of method, population, and setting and how to better stage outdoor education activities to meet the needs of autonomy, competence and relatedness.
APPENDIX A

VISUAL ANALOGUE, SEMANTIC DIFFERENTIAL SCALE
For each question below, please mark the line in the place that represents your judgment of nature and of your feelings at this moment. Do NOT circle the words at the end of each line. Please be as honest as possible.

For example

Good X Bad

At this moment nature is...

1. Good ———— Bad
2. Beautiful —— Ugly
3. Uncomfortable ———— ———— Comfortable
4. Meaningful ———— Meaningless
5. Unimportant ———— Important
6. Repelling ———— Attracting
7. Positive ———— Negative
8. Appealing ———— Offensive

At this moment I feel...

9. Alive ———— Bored to Death
10. Important ———— Unimportant
11. Tired ———— Energetic
12. Lifeless ———— Spirited
13. Alert ———— Sluggish
14. Asleep ———— Awake

Code symbol ________ Age ________ Date ________
APPENDIX B

ACTIVITY-STAGING STRATEGY SCRIPT
STAGING AUTONOMY, COMPETENCE, AND RELATEDNESS
SNOWSHOE MODULE TREATMENT CONDITION SCRIPT

Disclaimer: This is intended to be a partly a script as well as a set of guidelines which instructors can follow when facilitating the snowshoe outing for the treatment condition for the proposed study. Any safety concerns (physical or emotional), treatment goals, and behavioral issues take precedent over the study script. To ensure effective facilitation of the treatment condition, please take time to understand the script, follow the examples and suggestions on how to handle situations closely.

CREATING VALUE

Before the actual snowshoe outing begins instructors and students should have a group discussion about the outing. Instructors will provide a rationale or reasons why snowshoeing is important, fun, and worth-while for the students. Hear we are trying to create a sense of value surrounding snowshoeing and nature for the students.

We are going to learn how to snowshoe today. There are a number of different reasons why snowshoeing is a good skill to learn. You may think that snowshoeing is easy, it’s just walking after all. However, there are specific techniques that we will learn which will make it easier and more enjoyable.

It is believed that snowshoes have been in use for as long as 6,000 years. They were first used by people in central Asia and were invented by hunters who observed the tracks of animals, such as the snowshoe hare, that could walk on top of the snow. Snowshoes helped Native Americans and Mountain men to survive in winter by being able to continue to track and hunt in deep snow. Like the Natives and mountain men we are going to be doing a little animal tracking of our own today. Many different designs have been invented to accommodate different types of snow, terrain, and uses. Scandinavian people got the inspiration for the development of skis from the snowshoe. So we owe the fun we have skiing and snowboarding every weekend to the snowshoe.

Many people today use snowshoes as a way to get exercise and to access nature and the wilderness in winter. Backcountry skiers and snowboarders use snowshoes to access terrain that is not accessed by chairlifts, where fewer people and better riding conditions exist. There are numerous snowshoe clubs around the country where people can get together and snowshoe, make friends, and have adventures. There are also many snowshoe races and events held throughout the world.

Learning how to snowshoe will give you another skill that you can use in the future if you choose. Winter is a fun time to be out in nature and skiing/snowboarding is not the only way. Can any of you think of some other reasons why you think snowshoeing is an important activity?
IMPORTANCE OF CURRENT STUDY

After introducing the importance of snowshoeing and the free-time activity instructors should introduce the reason behind the study being conducted along with the questionnaires to be completed.

**Staff-** “Today as part of the snowshoe outing we will be asking you to fill out questionnaires. Remember when you signed the consent forms? Those were asking your permission to participate in this study. If you did not sign the form and/or your parents did not give permission for you to participate it is OK, you can still come snowshoeing with us and do all the activities, you just don’t have to fill out the questionnaires. Any questions so far?” You will be asked to fill out 6 different questionnaires, all the same, at 6 different times throughout the outing. Take as much time as you need to fill out each questionnaire. If you need help at any time please ask a staff and they will help you.

Explain questionnaires to students and answer questions.

**Staff-** “The purpose of this study is to try new techniques in outdoor education and see if they change a person’s opinion of nature. These techniques have been designed with you guys in mind. When you are answering the questions on the questionnaire please be as honest as possible. If your answers change from questionnaire to questionnaire that is OK, there are no right or wrong answers and you are not being judged on the answers on your questionnaire sheets. If your answers do not change from questionnaire to questionnaire that is OK too. Remember, you are not being judged or evaluated by the answers you give on your questionnaires. Any questions?”

AUTONOMY SUPPORT

In order to create an environment for autonomy support, opportunities for meaningful choice must be facilitated. Simply allowing for choice which holds no inherent meaning for an individual will not be as effective as allowing for choices which are in line with an individuals interests. Before the snowshoe outings students may be allowed to choose to participate in an activity of their choice during the outing (i.e. free time: playing games, photography, reading, writing, sitting quietly...) Instructors should encourage autonomous choices and facilitate opportunities to allow for the students choices. (i.e., if a student or small group of students are interested in taking photos during the trip, encourage the choice and provide a camera.) If working in groups the group size should be kept to a maximum of three students per group.

In some instances different ideas or opportunities may have to be presented to the students. (i.e., we have opportunities for photography, poetic readings, etc...) Instructors should present opportunities that are in line with the students known interests. If the instructor knows that a student or students are interested in writing music, present an opportunity for song writing about the experience.

One difficulty that may arise in allowing the choice is that some students will want to choose an activity that is not appropriate for the situation or environment. A clear
explanation for why the chosen activity is inappropriate for the snowshoe outing should be given by the instructor. When instances of conflict or expression of negative affect occur, staff should listen carefully to the student and accept negative reactions as valid. Staff should work with the student to try to solve the motivational problem using perspective taking, reasoning, and choice.

Example:
Jon- “I want to listen to my I pod while hiking.”

Staff- “Listening to music while hiking would be fun. However, it would limit your ability to hear instructions and may distract you from learning how to snowshoe and isolate you from the group.”

Jon- “That’s stupid. I can do both. I don’t care about the group. Why can’t I ever do anything I want?”

Staff- “I understand you are frustrated about not being able to listen to your music. I often listen to music while I am hiking or running and I get frustrated when the battery dies. Snowshoeing is also a great time to talk with people and be social. For this activity it will be best if you were able to hear instructions and not be distracted. Lets try to figure out something that you would like to do during the outing that is appropriate.” What are some interests you have that you could do today?”

If the student(s) are unable to identify an appropriate activity they can be encouraged to join a student or group of students whose chosen activity interests them most. These students will not be intrinsically motivated but may have a chance of identifying with and integrating the values of the chosen activity into their own value system.

During our snowshoe outing we will have some free time. You may choose an activity that you would like to do today when the free time is given. Pick something that you are genuinely interested in. For example if you like to write you may choose to bring along writing materials and write. If you like to play guitar, you may bring your guitar. This activity is of your choice however, please be appropriate when choosing your activity.

Staff will now spend time with the group of students identifying chosen activities, helping students chose activities that are appropriate, helping students who are unmotivated to choose an activity, organizing small groups, and gathering the needed materials for the activities. Be as accommodating as possible in the choices the students make. This is a key component to affecting autonomy support.
COMPETENCE

During the actual instructing that has to do with the physical aspects of snowshoeing, as well as throughout the snowshoe outing, we are trying to build feelings of competence in the students. There are several tactics we can use to accomplish this.

1. Informational vs. Evaluational language or feedback:

When giving feedback it is important, in terms of competence-building, to make sure the feedback is about the object and not the person. In constructive feedback instances informational feedback places emphasis on information about the object or task. Evaluational feedback focuses on the individual's performance.

Informational:
Student- "I can't get the snowshoe to stay on my boot."

Staff- "The snowshoe will stay on better if the straps are on tighter."

vs.

Evaluational:
Student- "I can't get the snowshoe to stay on my boot."

Staff- It won't stay on because you haven't strapped it down tight enough."

By focusing the feedback or language on the snowshoe strap rather than the student we send a message that the student is capable of making the snowshoe work rather than a message that the student has not strapped the snowshoe on correctly or is incapable.

2. Praise

Praise is an example of positive feedback that focuses directly on the individual. This is in contradiction with informational vs. controlling feedback outlined above however, praise has been shown to be particularly effective with boys. When giving praise use specific examples

Staff- "I noticed that you are able to get your snowshoes on very quickly, great job."

Staff- "You are very agile on your snowshoes. I saw you get around that tricky spot back there with ease."

3. Create a failure-tolerant atmosphere:

Staff will stage social contexts that are tolerant of failure and difficulty. This will be accomplished by supporting engagement, encouraging learning from failure, valuing failure as a learning and growth opportunity, and supporting competence and mastery of
challenge. Acknowledge when students are struggling or failing and use the incident as a learning experience. Re-focus attention on the positive aspects of the failure rather than dwelling on the failure itself.

Student- “I keep falling down.”

Staff- “It’s perfectly OK that you keep falling down. Many beginners fall a lot. The important thing is that you keep trying. It’s also a great way to learn how to get up easily. Let’s see what we can change so that it easier for you to stay upright.”

4. Structure

Structure provides support and guidance. Staff will directly model, explain, coach, and teach the students. If appropriate, staff will also allow for other, more competent students to teach those students who are struggling. Staff will explain problem-solving strategies, communicate clear expectations, help regulate negative emotions, share insight on repairing and preventing negative outcomes.

5. Optimal Challenge:

When choosing trails or areas to snowshoe on take into consideration the ability level of each individual as well as the group as a whole. If there are some who are more competent at snowshoeing, take them on more challenging terrain (up a hill) and have the students who are not as competent navigate less challenging terrain (go around the hill). Adjust challenge levels accordingly.

ENVIRONMENTAL EDUCATION LESSON

During the treatment outing the group will be given a choice to participate in an environmental education lesson; looking for and identifying animal tracks in the snow. Different types of animal track patterns will be taught by instructors and examples of animals which fit the different gaits given. Upon entering the field, students will be allowed to search for and try to identify the tracks that they find in the snow. After a while of identifying tracks instructors will allow each student or small groups of students the opportunity to create tracks of their choice as well as a scenario and explain them to the group given the new understanding of animal tracks they have been taught. Instructors should present the activity as an opportunity for each student to create a set of tracks, using whatever means, of an animal that you relate to or is most like you. You then have the choice of creating a scenario about the tracks and to explain to the rest of the group what has occurred in the scenario. Instructors can demonstrate. By allowing the students to choose an animal they relate to or like we are attempting to create meaningful choice (autonomy) within the activity. Again, if a student does not identify with an animal or choose one on his own, he can be encouraged to join another group.
During the nontreatment outing the group will not be given a choice of participating; all students will participate in the lesson. The nontreatment lesson will focus on adaptation and interrelations between animals in winter.

RELATEDNESS

To create feelings of relatedness the individual must feel as though he belongs to a group or social context. Again there are some specific techniques we can use to facilitate feelings of relatedness.

1. Have a sit-down group:

Facilitate a group process about the outing before then students actually go snowshoeing (either at the trailhead or at the school before leaving). Encourage students to talk about what they want to contribute to the group that day, why it is important that they be in a group, how it feels to be part of the snowshoeing group... The focus should be on the group in an effort to create the group as real, connected, and important.

Staff- "What do you hope to gain from being a part of a group that is snowshoeing together?"

2. Encourage small group formation:

Whenever possible students should be encouraged to work in smaller groups (i.e. during the choice activity and during animal track making and identifying), unless working in groups goes against the autonomous choice of the student. Small groups with no more than three or four students is ideal and may create opportunities for those who are intrinsically motivated in a certain activity to help others who are not intrinsically motivated to identify with and perhaps integrate the values of the activity.

3. Facilitate relationships and interactions that involve caring, liking, acceptance, and valuing between students:

- Facilitate checking in about the needs of others
- Avoid competition, reciprocity, material gain, and individualism
- Provide help for distressed individuals

4. Facilitate a closure activity:

When you arrive back at the trailhead and after all snowshoe equipment is loaded, a special treat (root beer, soda) is given to each student (if they choose). Staff then begins a story about how one of the best parts about snowshoeing, or outings in general, with friends is telling stories about the day’s events. Invite students to share stories about the day’s outing (highlights, funny occurrences, etc...) This does not have to be structured in
the sense that everyone has to participate. However, forming a circle with the group will help facilitate involvement and attention.

Staff- “I love skiing with friends but one of the best parts of the day is when you get back to the car and talk about the funny things and the best parts of the day. Remember today when...”

Staff- “What was your favorite part of today?”
APPENDIX C

TIMELINES FOR TREATMENT AND NO TREATMENT

CONDITION OUTINGS
TIMELINE FOR TREATMENT CONDITION OUTING

The designated time for each snowshoe outing is between 4 and 6 hours. It is not crucial however if the outing goes over the 6 hour limit. Instructors should use the timeline below as a guide as to the order of procedures and time each activity accordingly to meet the time limits. Questionnaires should only take 3-4 minutes (on average) to complete. Please help students who have questions about the meanings of words or how to fill out the questionnaire.

Pre-outing (at home, before leaving)

- Introduce activity and relay story about value and importance of snowshoeing.
- Introduce choice activity, accommodate student’s needs, address difficulties and/or negative affects.
- Introduce the study questionnaires and purpose of study to students
- Leave for trailhead (trail will be chosen beforehand).

During outing (at the trailhead)

- Administer 1st questionnaire to students
- Introduce the equipment to students, give detailed demonstration of how to use each piece of equipment, explain what each piece is used for, answer questions.
- Help students get snowshoes on, answer questions, look for opportunities to give competence messages and praise.

During outing (on the trail)

- Look for opportunities for praise and informational feedback, address negative affect, create failure-tolerant atmosphere, look for failure-based learning opportunities. Hike for about 30 minutes and...

- Administer 2nd questionnaire

- After hiking for about 30 minutes longer, allow students to have free time and to be involved in their chosen activity. Be as accommodating as possible for the student’s free time activity, encourage students who may not have an activity or who are showing negative affect to work with other students whose activity most interests them. This activity should last at least 20 minutes and can be adjusted to be longer if time permits.
- Administer 3\textsuperscript{rd} questionnaire

- Continue hiking (if necessary) to destination or turn-around point

- Allow students the choice of participating in a tracking lesson. If students do not want to participate in the lesson they should be allowed to participate in their chosen activity once again. Conduct animal tracks lesson. Allow students to choose an animal that they relate with or like and make their own set of tracks. They may also create a story or scenario about the tracks. Look for opportunities for competence messages, working in small groups, address negative affect… This lesson should be timed to take about 30 minutes.

- Administer 4\textsuperscript{th} questionnaire

- Begin to return to the trailhead. Continue to instruct students on proper snowshoe techniques if applicable, use competence messages, address negative affect accordingly, etc…

- Administer 5\textsuperscript{th} questionnaire, making sure that you still have some time (10-15 minutes) until you reach the trailhead.

Post-outing (back at the trailhead)

- At the trailhead, after snowshoes have been taken off and stowed for leaving, hand out special treat (soda, candy bar, etc…). Tell a story of how when you have gone out with friends on snowshoeing, skiing, etc… trips that one of the best parts is hanging out with friends afterward, telling stories of the day, etc… Facilitate an informal group (standing) to allow students to reflect and share on the highlights of the day’s trip.

- Administer 6\textsuperscript{th} (and final) questionnaire after storytelling has been completed and before you leave the trailhead.

Post-outing (back at Gateway)

- Ask the students to reflect on the highlights of their experience concerning the instructors and how they taught and lead the outing. Have a staff record the answers (only if student gives permission to do so).

- Instructors should take some time to write down notes about their experience in terms of facilitation and instruction; what worked well, what could be improved, what didn’t work at all, as well as any candid reflections that you may feel are important to the study.
ABBREVIATED TIMELINE FOR TREATMENT

Administer 1\textsuperscript{st} survey upon arriving at trailhead and before you do anything involving snowshoeing.

Introduce snowshoe equipment, give instructions, help students, begin hiking

Hike for about 10 minutes

Administer 2\textsuperscript{nd} survey

Hike again for 20-30 minutes

Allow for choice activity

Administer 3\textsuperscript{rd} survey

Hike to destination or turn-around point (if necessary)

Allow choice of participation in EE lesson

Administer 4\textsuperscript{th} survey

Begin hike back to trailhead

Administer 5\textsuperscript{th} survey about half way back to the trailhead

Arrive at trail head, Put all snowshoe equipment back into trucks

Facilitate closure activity

Administer 6\textsuperscript{th} survey before leaving trailhead

Return home
ABBREVIATED TIMELINE FOR NONTREATMENT

Administer 1st survey upon arriving at trailhead and before you do anything involving snowshoeing.

Introduce snowshoe equipment, give instructions, help students, begin hiking

Hike for about 30 minutes

Administer 2nd survey

Facilitate EE lesson

Administer 3rd survey

Hike further to destination or turn-around point

Have lunch

Administer 4th survey

Begin hike back to trailhead

Administer 5th survey about half way back to the trailhead

Put all snowshoe equipment back into truck

Administer 6th survey

Return home
APPENDIX D

STRATEGIES FOR SATISFYING PSYCHOLOGICAL NEEDS DURING A SNOWSHOE OUTING
<table>
<thead>
<tr>
<th>Outing Phase</th>
<th>Psychological Need</th>
<th>Technique</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-outing preparation</td>
<td>Autonomy</td>
<td>Interests, preferences, and competencies will be identified through discussion between students and staff and “member checking” confirmation with the student (Reeve, 2005).</td>
</tr>
<tr>
<td>Pre-outing preparation</td>
<td>Autonomy</td>
<td>The value, worth, meaning, utility, or importance for engagement in activities will be communicated to the student through a conversation involving staff and students. A rationale for participation which will promote valuing will also be included in that conversation (Reeve, 2005).</td>
</tr>
<tr>
<td>Pre &amp; During outing</td>
<td>Autonomy</td>
<td>When instances of conflict or expression of negative affect occur, staff will listen carefully and accept negative reactions as valid. Staff will work with the student to try to solve the motivational problem using perspective taking, reasoning, and choice.</td>
</tr>
<tr>
<td>During outing</td>
<td>Autonomy</td>
<td>Staff will use informational language rather than controlling language to provide feedback and to address motivational and/or behavioral difficulties (Deci &amp; Ryan, 1985; Reeve, 2005).</td>
</tr>
<tr>
<td>During outing</td>
<td>Competence</td>
<td>Staff will stage the encounter with opportunity for optimal challenge for each individual’s ability (Reeve, 2005) (i.e. allow more skilled student’s opportunity for greater challenge, allow those who struggle lesser challenge).</td>
</tr>
<tr>
<td>During outing</td>
<td>Competence</td>
<td>Staff will stage social contexts that are tolerant of failure and difficulty. This will be accomplished by supporting engagement; encouraging learning from failure; valuing failure as a learning and growth opportunity, and supporting competence and mastery of challenge (Reeve, 2005).</td>
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<td>Competence</td>
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negative emotions, share insight on repairing and preventing negative outcomes, administer consequences in ways that are consistent, predictable, and contingent on other’s actions (Reeve, 2005).

Competence messages in the form of informational feedback will be delivered by staff. Such messages are more effective than ambiguous and/or controlling messages at increasing perceived competence (Deci & Ryan, 1985). Informational feedback places emphasis on information about the object or task rather than the individual’s performance in constructive feedback instances.

Praise will be included as a positive feedback technique. This approach has been demonstrated to be particularly powerful when used with males (Deci & Ryan, 1985).

Staff will facilitate relationships and interactions that involve caring, liking, acceptance, and valuing between students (Reeve, 2005).

Staff will foster communal relationships by facilitating checking in about the needs of others, avoiding competition, reciprocity, material gain, and individualism, and providing help for distressed individuals (Reeve, 2005).
**Procedure**

The study will involve two winter snowshoe outings. In one of these outings, participants will receive the treatment condition and on the other outing, they will receive the nontreatment condition. Three groups of approximately 12 students will complete this two-encounter program. Implementation of treatment will be counterbalanced to account for possible order of treatment effects. All outings will be day trips lasting approximately 4-6 hours. Snowshoeing is a standard part of the recreation program for the students. The only changes that students who agree to participate in the study will experience will have to do with interactions between leaders and the students, and the completion of self-report questionnaires on multiple occasions during each 4-6 hour encounter.

The treatment condition will consist of a snowshoe outing staged in line with the tenants of self-determination theory (Deci & Ryan, 1985; 2002). Specifically, involvement of students’ autonomy, competence, and relatedness needs will be targeted through specific leadership strategies. Below is a diagram outlining the experimental and traditional treatments. Traditional treatment is how the snowshoe outing would normally be facilitated as part of the existing recreation component of the residential program.
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</tr>
<tr>
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</tr>
<tr>
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<td>Competence</td>
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</tr>
</tbody>
</table>
During & Post-outing  Competence

more effective than ambiguous and/or controlling messages at increasing perceived competence (Deci & Ryan, 1985). Informational feedback places emphasis on information about the object or task rather than the individual’s performance in constructive feedback instances.

Praise will be included as a positive feedback technique. This approach has been demonstrated to be particularly powerful when used with males (Deci & Ryan, 1985).

Pre, During, & Post-outing  Relatedness

Staff will facilitate relationships and interactions that involve caring, liking, acceptance, and valuing between students (Reeve, 2005).

Pre, During, & Post-outing  Relatedness

Staff will foster communal relationships by facilitating checking in about the needs of others, avoiding competition, reciprocity, material gain, and individualism, and providing help for distressed individuals (Reeve, 2005).

Leaders will facilitate a reflection activity where participants will be asked to share verbally their experiences for the day (highlights, funny moments, favorite parts, etc...) The tone should be positive and focus on the group.

During outing  Relatedness
GUIDE TO MAJOR CONCEPTS

AUTONOMY
Has been defined as a freedom from control. As a matter of meeting basic psychological needs, people want choice, they want to feel as if they have control over or choices in their circumstances. Choice is the driving force behind autonomy support. When people feel autonomous they exhibit more intrinsic motivation.

MEANINGFUL CHOICE
Means a choice of options that the person is intrinsically interested in. Providing a simple choice between two options does not facilitate meaningful choice. In this study we are providing a choice of intrinsically interesting activities, we are not presenting 2 or more pre-selected activities.

INTRINSIC VS. EXTRINSIC
Intrinsically motivated behavior has is happening when a person is doing an activity for no other reason besides that they want to and for the sheer enjoyment of the activity. (what are some intrinsically motivated activities you have?)
Extrinsically motivated behavior is behavior that is done because there is an external reward or reason for doing the behavior. (payment, for most, is a form of extrinsic motivation. People go to work and perform their jobs because they get paid.)

COMPETENCE
A sense of competence is built through successful functioning in the world. It is built through positive experiences where a person is challenged and meets and overcomes the challenge. Humans have a basic need to feel effective in their interactions with the environment.

COMPETENCE MESSAGES
These messages allow the person receiving them to believe they are meeting and overcoming the challenges. These are positive by nature and work to build one’s sense of competence in a specific area or activity.

INFORMATIONAL VS. EVALUATIVE FEEDBACK
Informational feedback focuses on the object or the circumstances outside the person. Evaluational feedback focuses on the person. This concept applies to constructive feedback. If you make the feedback or message about the object it takes the focus off of the individual which in turn lets the individual believe that they have control and are doing well at the activity.

PRAISE
Praise is a form of feedback that is evaluational, but in a positive way. When giving praise it is necessary to focus the message on the individual or group. Praise has been shown to be more effective with males.
FAILURE-TOLERANT ATMOSPHERE
A failure-tolerant atmosphere is set by the facilitator. The facilitator recognizes failures and uses them as learning opportunities (paints them in a positive light). In a failure-tolerant atmosphere participants know and feel that it is OK to fail. This kind of atmosphere works to foster competence-building.

ACCEPT NEGATIVE REACTIONS AS VALID
When participants express negative affect or have negative reactions, the facilitator must accept these reactions as a valid part of the participant's experience. Do not ignore them, accept them, address them, and help the participant to continue, perhaps with a more positive outlook.

PERSPECTIVE TAKING
A tool to be used in light of negative affect or reaction. "I can understand that this is not your favorite activity. I remember when I had to do something I didn't like. After you have taken the other's perspective, try to spin the activity in a positive light, help the participant find something positive.

RELATEDNESS
People have a basic psychological need for belonging to a group, we are social beings. Relatedness can be fostered through positive interactions for participants within a group setting. Relatedness will be targeted through facilitators who foster interactions that involve caring, liking, acceptance, and valuing between students. Facilitate checking in about the needs of others, avoid competition, reciprocity, material gain, and individualism, and provide help for distressed individuals.
APPENDIX F

TABLE OF THREATS TO VALID INFERENCE MAKING
<table>
<thead>
<tr>
<th>Threat</th>
<th>Level of Control</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>History</td>
<td>Not Controlled</td>
<td></td>
</tr>
<tr>
<td>Maturation</td>
<td>Yes</td>
<td>Counter-balancing will control any maturation.</td>
</tr>
<tr>
<td>Testing</td>
<td>Yes</td>
<td>The instrument measures in-situ judgments and emotions. No carry-over effect from testing occasion to another is thus expected.</td>
</tr>
<tr>
<td>Instrumentation</td>
<td>Yes</td>
<td>The same instruments will be used on every measurement occasion.</td>
</tr>
<tr>
<td>Statistical Regression</td>
<td>Yes</td>
<td>Change scores will not be calculated or analyzed.</td>
</tr>
<tr>
<td>Selection Bias</td>
<td>Yes</td>
<td>All students will be invited to participate.</td>
</tr>
<tr>
<td>Attrition</td>
<td>Unknown</td>
<td>Some student may choose to participate on one occasion and not another, or some other factor may preclude participation in more than one outing.</td>
</tr>
<tr>
<td>Interactions with selection</td>
<td>Yes</td>
<td>In the proposed design, participants will be exposed to both treatment conditions.</td>
</tr>
<tr>
<td>Diffusion of treatment</td>
<td>Partially</td>
<td>Some students from the three groups have the opportunity to interact with other students.</td>
</tr>
<tr>
<td>Compensatory rivalry</td>
<td>Yes</td>
<td>No achievement goal is associated with the study.</td>
</tr>
<tr>
<td>Demoralization</td>
<td>Partially</td>
<td>Some students from the three groups have the opportunity to interact with other students.</td>
</tr>
<tr>
<td>Personological variable and treatment interaction</td>
<td>Yes</td>
<td>The repeated measures design controls this threat.</td>
</tr>
<tr>
<td>Construct validity of cause</td>
<td>Partially</td>
<td>Staff will participate in extensive training that includes practice simulation. Manipulation checks will also be used.</td>
</tr>
<tr>
<td>Multiple treatment interference</td>
<td>Yes</td>
<td>No additional treatments were present.</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>-----</td>
<td>--------------------------------------</td>
</tr>
<tr>
<td>Reactive effects</td>
<td>Yes</td>
<td>The construct measures presents little opportunity for reactivity.</td>
</tr>
<tr>
<td>Pretest sensitization</td>
<td>No</td>
<td>No pretest is given.</td>
</tr>
<tr>
<td>Experimenter effect</td>
<td>No</td>
<td>The leaders will not be blind to the purpose of the study. Such a design is not feasible in this situation.</td>
</tr>
<tr>
<td>Low statistical power</td>
<td>Yes</td>
<td>Repeated measures will yield higher numbers of observations.</td>
</tr>
<tr>
<td>Statistical assumptions</td>
<td>Unknown</td>
<td>The necessary statistical assumptions will be evaluated. Appropriate adjustments to scores or analytic techniques will follow from that evaluation.</td>
</tr>
<tr>
<td>Reliability of measure</td>
<td>Unknown</td>
<td>Semantic differential methods consistently produce acceptable reliability estimates</td>
</tr>
<tr>
<td>Error rate problem</td>
<td>Yes</td>
<td>Only one central hypothesis is being tested</td>
</tr>
<tr>
<td>Reliability of treatment</td>
<td>Yes</td>
<td>Leader training and manipulation checks should substantially reduce this threat.</td>
</tr>
<tr>
<td>implementation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Random irrelevancies in</td>
<td>Partially</td>
<td>Weather conditions, pervasive moods, and a host of other situational factors will likely introduce error variance into the measures. The repeated measures design should compensate for these events.</td>
</tr>
<tr>
<td>experimental setting</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX G

ENVIRONMENTAL EDUCATION LESSON PLANS
WINTER ADAPTATION AND INTERRELATION LESSON PLAN FOR NONTREATMENT OUTING

Engage: Ask students to identify some adaptations that they are using at the moment and in their lives to meet and beat the challenges of winter. (i.e., warm jackets, waterproof material, snowshoes, hats, houses, heaters, shovels, snowblowers, etc.)

Explore: Ask: What are some challenges that animals face in winter?

Explain: Challenges: SCREW – sun, cold, radiation, evaporation, and wind. Staying warm, difficulty traveling in deep snow, difficulty finding food due to deep snow.

Explore: Ask: What are strategies that animals might use to survive the challenges of winter?

Explain: Show pictures and explain various behaviors – both interrelationships and adaptations each animal below:

Explain the concept of adaptations: The process of adjustment of an individual organism to environmental conditions. It may occur by natural selection, resulting in improved survival and reproductive success, or involve physiological or behavioral changes that are not genetic. As well as being a process, an adaptation can also be the end product of such a process, i.e., any structural, behavioral, or physiological character that enhances survival or reproductive success. Adaptations enable living organisms to cope with environmental stresses and pressures. In the examples given below, these animals have made adaptations to better survive the challenges of winter.

Explain the concept of interrelations: Interrelations are relationships that animals have with other animals and/or the environment where each is effected in some way. Interrelations can be beneficial for both, or beneficial for one and detrimental to the other. Interrelations connect animals to each other and the environment and help provide a balance. However, some interrelations can alter the balance in nature as in the case of the porcupines below.

Snowshoe Hare

Adaptations: white, increase in foot size, coprophagy (feeding on excrement), subnivean (under the snow) to protect against heat loss and predators
Interrelations: winter active mammal, important food source for predators, plant predator

Red Squirrel (Chickaree)

Adaptations: food caching (pine cone seeds, fungi, bird eggs, shoots, berries); share shelter, called a drey, for warmth

Interrelations: forest regeneration (spread seeds for trees), food cache’s provide food for other seed eating mammals

Weasel (family includes skunk, marten, mink, badger, ferret, wolverine, fisher)

Adaptations - subnivean for warmth and protection, turns white or mouls in winter (camouflage from predators)

Interrelations - predator in subnivean food web (carnivorous, eats mice & other small rodents)

Ungulates (hoofed mammals: deer, moose, elk, mountain goat & sheep)

Adaptations: elevational migrants (move from high elevation to lower elevation for ease of travel and finding food, hollow hair stores warmth

Interrelations: food source for carnivorous animals (wolves, cougar)

Porcupines

Adaptations - diet switching from greens to cambium (thin layer of generative tissue lying between the bark and the wood of a stem of tree, creates new wood growth)

Interrelations - few predators – fisher (in weasel family) and mountain lions; porcupines eat the bark of trees in winter which can kill the tree (not beneficial).

Extrapolate/Evaluate: Small groups of students (2-3) are allowed time to explore the surrounding area for signs of adaptations. The best opportunity is hunting for tunnels in the snow. Shovels will be provided for digging. Instructors should show students where to find tunnels and demonstrate if possible. Tunnels can usually be found near tree wells, downed trees, or other structure. Once the instructor has demonstrated allow the small groups to go on their own to find their own tunnels. Another sign of adaptations is remnants of pine cones from squirrels feeding on the seeds. The remnants can usually be found at the base of trees as the squirrel feeds
on them from above. Nests or dreys in trees can sometimes also be sighted.
WINTER TRACKS LESSON PLAN FOR TREATMENT OUTING

Engage: Read Winnie the Pooh tracking story.

Explore: Discuss the things that tracks can tell us about wildlife in the area? (who is there, how many, how fast, what they eat, predation stories, what direction they are moving etc etc) This can be explained when looking at the actual tracks.

Explain: There are three main types of track patterns we need to become familiar with. Draw or create the three patterns of animal gaits in the snow and have students move through them.

Explore: What animal(s) might move in the way represented by the track? What animals might we see, who lives there and why?

Explain: Explain which animals have which gait or tracks. (use pattern classification sheet below)

Elaborate: Small groups find track(s) and go through the following procedure:
- Make a short list of what animal it might be based on the pattern
- List other clues that might narrow down that list – habitat, other signs etc.

Extrapolate/Evaluate: Small group landscape activity
Chose an animal or animals that you relate with or like. Write a story about your animal on the snow using the tracks and gaits you have learned about. Each individual will present their story to the others. Have students work in small groups (2-3 students) if more than one has an interest in the same animal.
TRACK PATTERN CLASSIFICATION

In each case below the gait described is the normal walking pattern for that animal.

RF = right front LR = left rear, etc.

1) **Diagonal Walkers** - the animal moves the opposite sides of the body at the same time (e.g. RF & LR move simultaneously)
   Deer, Dog, Cat - cat and fox direct register (place rear foot in the track of the front foot) by being completely off the ground at one point

2) **Bound Walkers** - the front feet land together, then the rear feet behind 99.9% of the time these animals use this pattern even when moving slow or fast.
   Weasel Family - All Members Except Skunks & Badgers

3) **Gallop Walkers** - the front feet land first, then the rear feet come on the outside of the front feet and land ahead, this is called overstride. 99.9% of the time these animals use this pattern even when moving slow or fast. The pattern doesn't change with speed. The distance between sets of tracks increases.
   Rabbits, Hares, Squirrel, Chipmunk, Rodents - Except Porcupine & Ground Hog.
   If the front feet hit at a diagonal = ground dwelling rodent e.g. Rabbit. If the front feet hit side by side, it is a tree dweller, e.g., Squirrel or Chipmunk.

4) **Pacers** - move the same side of the body at the same time (e.g. RF & RR) - these animals have wide, rotund bodies. These are the exceptions from the other groups. 95% of the time these animals use this pattern. As speed increases, they change their pattern.
   Badgers, Skunk, Porcupine, Opossum, Raccoon, Bear

5) Variations on Pattern Classifications - 5% of the time. All animals can change their gait. In particular, Diagonal Walkers and Pacers will change their pattern as their speed increases.

   As the animals speed changes this pattern will change (ex. moving slowly, in pursuit, being chased).

Continuum of Speed:

Stalk ------->Slow Walk ------->Walk ------->Trot ------->Bound ------->Lope ------->Gallop
REFERENCES


