
Articles

Attending to Past Outdoor Recreation Experiences: Symptom Reporting and Changes in Affect

Michael A. Tarrant
University of Georgia

Changes in affect and physical symptom reporting were compared across four treatment conditions: recollection of a passive and active outdoor recreation experience, recollection of a past classroom exam, and an autogenic relaxation method. Results from 44 participants in a laboratory experiment demonstrate that recreation recollections have the potential for use as a guided imagery technique by promoting positive affect, reducing negative affect and decreasing symptom reporting. Support for two information processing theories, Pennebaker's (1982) "Competition of Cues" and the Kaplans' (1989) "Experience of Nature," was found. Perceived health benefits were greatest when attention was involuntary (versus directed) and focused on external (versus internal) stimuli. Implications of recreation recollections for therapeutic recreation and benefits-based management are discussed.

KEYWORDS: *outdoor recreation, recollection, information processing, affect, physical health symptoms, therapeutic recreation, benefits-based management.*

Introduction

Attending to past outdoor recreation experiences involves the recollection of information about past leisure behavior and events that has previously been stored in memory. Although there have been few empirical studies of recreation recollections, recently Tarrant, Manfredo and Driver (1994) reported lower autonomic arousal during, and improved mood immediately following, the recall of past recreation experiences relative to the recollection of an exam event. The current study extends the earlier work of Tarrant et al. (1994) by examining perceived benefits (reductions in physical health symptoms and changes in affect) associated with the recollection of outdoor recreation experiences. To examine potential benefits, the effects of recreation recollections are compared with those evoked from a traditional stress management technique known as autogenic relaxation. The influence of two

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coping resources (social and physical escape) on the effects of recreation recollections is also explored.

Two models, both rooted in information processing theory, suggest outdoor recreation recollections may produce beneficial effects. The first, Kaplan and Kaplan's work on "The Experience of Nature" (1989), contends that nature has a restorative capability (i.e., to reduce mental fatigue) by fostering involuntary attention. The second, Pennebaker's "Competition of Cues" hypothesis (1982), proposes that outdoor environments direct attention toward external stimuli and hence away from internal (bodily) sensations.

The Experience of Nature

The Kaplans (1989) argue that interactions with nature facilitate restoration by providing recovery from the mental fatigue caused by excessive directed attention. In contrast to involuntary attention which arises with diverse and interesting environments, directed (or voluntary) attention occurs when the external environment lacks stimulation and complexity. While it has been shown that excessive external stimulation may cause psychological overload (Bexton, Heron & Scott, 1954) and too little may lead to boredom and stress (see Hubbard, 1992), there is evidence to suggest that people have a strong preference to view diversity in natural scenes (U.S. Bureau of Land Management, 1980). Furthermore, not only are interactions with nature often pleasurable but they also provide the opportunity for temporary escape from the demands and stresses of everyday life (Hartig, Mang & Evans, 1991; Kaplan & Kaplan, 1989). Other work also suggests that nature may have a therapeutic value by providing positive distractions (Ulrich, Dimberg & Driver, 1991). In studies of hospital patients (Ulrich, 1981, 1984) and office employees (Kaplan, Talbot & Kaplan, 1988), for example, window views of nature have been shown to increase positive feelings, lower stress, and improve physical conditions.

Competition of Cues

Based on the assumption that people will only process a finite amount of information at any one time, Pennebaker (1982) proposes that internal and external sources of information compete for attention; i.e., as the number and salience of external cues increase (decrease), attention to internal stimuli will subsequently decrease (increase). This hypothesis further contends that an individual's tendency to report physical symptoms varies as a function of the relative availability of external stimuli; i.e., as external cues increase or become more salient, the probability of reporting perceived health problems decreases. The model predicts, for example, that people will report more physical symptoms in a boring and unstimulating environment than in an interesting one (Watson & Pennebaker, 1989). Several studies have supported the competition of cues hypothesis. Pennebaker and Lightner (1980) found that athletes reported more symptoms and fatigue when running an indoor versus cross-country track, independent of the time

it took to complete the course. The conclusion was that since indoor tracks lack external information (relative to cross-country), indoor runners processed more internal information and focused on internal sensations, increasing the tendency to report physical ailments. Other work has shown that subjects coughed more (Pennebaker, 1980), reported more negative emotions (Pennebaker, 1982) and were more aware of fatigue (Pennebaker & Brittingham, 1982) when the environment was lacking external stimuli.

Beneficial Effects of Recollection

Two measures of perceived health are examined. These are physical health symptoms and changes in affect.

Physical health symptoms. Physical symptoms reflect an individual's perceptions of their physical health ailments, such as headaches, muscle tension and shortness of breath (Pennebaker, 1982; Watson & Pennebaker, 1989). Evidence suggests they are moderately and significantly correlated with objective health measures such as frequency of physician and health center visits (Pennebaker, 1982), physician ratings (LaRue, Bank, Jarvik, & Hetland, 1979) and medical records (Linn & Linn, 1980). Although there have been few empirical studies of the relationship between physical symptoms and recollection, symptom reporting may provide important indicators of health status during periods of recall. One reason for this is that health symptoms are typically associated with specific and temporary internal states of arousal, such as those caused by the transitory processing (including recollection) of mental information (Marks, 1984; Skelton & Pennebaker, 1990).

Affect. A dominant response to the recall of information is a shift in positive and/or negative affective response (Staats & Lohr, 1979; Tarrant et al., 1994). Very often these changes are associated with health benefits. For example, stimuli that evoke positive affect have been used in therapeutic settings to control phobias (Bandura, 1986; Ahsen, 1984; Weiss, 1989), to reduce depression and stress disorder (Jordan & Lennington, 1979; Jordan, 1984), to improve self-esteem (Buechel, 1986; Lappe, 1987), and to enhance the immune system by increasing endorphin activity (Miller, Murgu & Plotnikoff, 1983). Research has shown that positive affect is associated with improved locus of control (Moore, Underwood & Rosenhan, 1984), which in turn, increases the likelihood of performing health promoting behaviors (U.S. Department of Health and Human Services, 1986). Moderate correlations of between .30 and .50 have also been reported between negative affect and self-reported stress (Clark & Watson, 1988; Kanner, Coyne, Schaefer & Lazarus, 1981), health complaints (Watson & Pennebaker, 1989) and daily hassles (DeLongis, Folkman & Lazarus, 1988; Stone, 1981).

Autogenic Relaxation

Autogenic relaxation is a widely-adopted form of psychosomatic self-regulation in which individuals are asked to imagine sensations (primarily heaviness and warmth) of different parts of the body (e.g., hands, arms, legs,

and forehead) (Lindem, 1993; Norris & Fahrion, 1984). No active physical exercises are involved; the body remains in a passive state (sitting-up or lying-down) while the individual uses imagery and self-instructions to induce a relaxation response (Chagill, 1992). Autogenic relaxation has been shown to reduce hypertension (Charlesworth & Nathan, 1982) and the occurrence of tension headaches (Anderson, Lawrence & Olson, 1981). One of the basic requirements of autogenic relaxation is that the individual directs his or her attention inward through "the reduction of external stimuli and mental focusing on internal physical and mental states" (Chagill, 1992, p.310). While the effect of autogenic relaxation on physical symptoms and affect has not been reported, the therapeutic (i.e., stress reduction) value of the technique provides a comparative treatment condition with which to examine the perceived health benefits of recreation recollections.

Coping and Recreation Recollections

It has been suggested that leisure activities provide coping resources to alleviate mood and influence health (Coleman & Iso-Ahola, 1993; Hull, 1990). One of the most often cited coping resources associated with outdoor recreation is temporary escape (Driver & Knopf, 1977; Driver, Tinsley & Manfred, 1991). Temporary escape, which includes escape from physical and social factors, may help promote positive feelings because it gives the individual a sense of control (albeit transitory) over a stressor (Ulrich, Dimberg, & Driver, 1991). Ulrich et al. (1991) suggest escape functions as a type of coping behavior by allowing the recreationist either directly (through on-site participation) or indirectly (via recollection) to distance themselves from everyday activities. According to the Kaplans (1989), the opportunity to "get away from it all" or for escape to outdoor environments is a critical factor in the restorative value of nature. It is likely, therefore, that individuals who associate stronger escape-related motives with a particular outdoor recreation activity will be better able to cope with the recollection of that activity, exhibiting fewer physical symptoms and more positive feelings, than persons with relatively weak escape motives.

Hypotheses

Both information processing theories reviewed here suggest outdoor recreation recollections may produce therapeutic effects. According to the Kaplans (1989), outdoor recreation recollections may provide the opportunity for involuntary attention and positive distraction that is associated with reduced mental fatigue and more positive feelings. Consistent with the Competition of Cues model (Pennebaker, 1982), outdoor recreation recollections may provide the context for processing more external (versus internal) information, thereby inhibiting perceptions of physical symptoms. It is hypothesized, therefore, that experiences that either command directed attention and/or lack external cues (such as taking an exam inside a classroom) will

evoke more negative feelings and physical symptoms than experiences promoting involuntary attention to external stimuli. Classroom exams, for example, not only require effortful (directed) concentration but involve mental avoidance (i.e., the “shutting-out”) of external distractions and stimuli. While the autogenic relaxation technique also requires directed attention and toward internal sensations, it is likely that the relaxation therapy itself may act as a buffer to reduce any perceptions of negative health conditions.

Hypothesis 1. Recollections of outdoor recreation experiences will induce fewer physical symptoms, higher positive affect, and lower negative affect than recollections of a previous classroom exam.

Hypothesis 2. Recollections of outdoor recreation experiences will induce similar reports of physical symptoms, positive affect, and negative affect as compared with the autogenic relaxation method.

Hypothesis 3. Preferences for social and physical escape will be directly related to positive affect and inversely related to physical symptoms and negative affect.

Method

Subjects

Fifty-four undergraduate and graduate students (mean age = 25.2 years, 59% male) from a mid-sized western university participated in a two-stage study. Involvement was voluntary, however, students were informed that those who completed all requirements of the study would be awarded class credit (for meeting a research participation requirement) and a fifteen dollar incentive.

Design

In stage one, a self-report questionnaire was used to (a) screen subjects with health problems (e.g., were on drugs or medication, had fractured or broken bones), (b) prompt recollection of a previous favorite passive and a favorite active outdoor recreation experience, and (c) measure the perceived importance of temporary escape as related to each of the two recalled passive and active recreation experiences. Subjects were informed that passive outdoor recreation experiences concerned activities engaged in a natural setting that involved a minimum of personal risk and were perceived as stress reducing and relaxing; while, active outdoor recreation experiences included activities engaged in a natural outdoor setting that were stimulating and involved moderate to high physical exertion.

Stage two involved a repeated measures design, in which subjects completed a series of three minute treatments in a laboratory situation. All subjects completed the same number and type of treatments, with treatments randomly ordered. Treatments involved the recall of the passive and active outdoor recreation experiences they indicated on the self-report questionnaire, and a previous classroom exam experience. For the autogenic relax-

ation condition, subjects listened to a pre-recorded autogenic relaxation tape. To induce feelings of "heaviness" and "warmth," the tape asked subjects to repeat several statements (each for approximately a 20 second period). The focus was on the arms and hands and included statements such as, "my right arm is heavy and warm," "warmth is flowing into my hand." A transcript of the tape can be found in Lehrer and Woolfolk (1993).

During each of the four treatments, physiological measures were recorded.¹ Immediately after each treatment, self-report measures of positive affect, negative affect, and physical health symptoms were taken.

Affect. Affect was measured using the Positive and Negative Affect Scale (PANAS) developed by Watson, Clark and Tellegen (1988). This scale consists of two, 10-item affect scales, each with a 5-point Likert-type response format. Examples of positive affect items include, excitement, attention, and alertness; negative affect items include, nervousness, irritability, and distress. Each item was anchored using a scale from "not at all" to "extremely" (with respect to the specific affect item being measured).

Reliability and validity estimates of the PANAS have been reported by Watson, Clark and Tellegen (1988). Internal consistency for both scales is relatively high. Alpha reliabilities range from between .86 to .90 for positive affect, and between .84 to .87 for negative affect. Test re-test reliability was moderate, with average correlations across an 8-week period for positive affect of .47 to .68 and for negative affect of .39 to .71. Validity was assessed by regressing the two scales on a two-factor structure (representing 63% of the variance) of Zevon and Tellegen's (1982) 60-item mood scale. The positive affect scale was significantly related to factor A (.89) but not B (-.02), while the negative scale was unrelated to factor A (-.18) but significantly with factor B (.95), suggesting the two scales measure independent factors.

Physical health. A 12-item self-report State Symptom Checklist scale by Pennebaker (1982) was used to measure a person's awareness of physical health symptoms (e.g., "tense muscles," "racing heart," "headaches," "upset stomach", "dizziness", and "shortness of breath"). Subjects were asked to indicate with an "X" along a 100 mm line, anchored by two end points (e.g., "no racing heart" to "racing heart"), to what extent they perceived the condition at that point in time. High (low) scores on the State Symptom Checklist are associated with high (low) reports of physical health symptoms. The Scale's internal consistency is moderate with an average alpha reliability across several studies of .75 (Skelton & Pennebaker, 1990). Test re-test scores, however, are low; across 1-, 2-, 3-, and 4-month time periods, correlations averaged .21, .14, .16 and .07. One reason for the low test re-test correlations is that the Scale is designed to measure a person's present awareness of symptoms (Watson & Pennebaker, 1989) and should not necessarily predict future perceptions. No validity measures have been reported in the literature.

¹Physiological data are not presented here. Interested readers are referred to Tarrant, Manfredo and Driver (1994) for a review of these findings.

Temporary escape. For both the passive and active outdoor recreation experiences identified in the first stage of the study, subjects were asked to respond to ten items from Driver's Recreation Experience Preference scale (Driver, 1977). Items were selected that had the highest factor loading within each of five scales representing the domains of "physical escape" and "social escape" (Manfredo, Driver, & Tarrant, in review). The five items representing social escape were: "To release clutched-up feelings," "so my mind could move at a slower pace," "to get away from the demands of other people," "change from my daily routine," and "to forget the pressures of my daily work for a while." For physical escape, the five items were: "To experience the tranquility there," "because there is more elbow room there," "for the solitude," "to get away from crowded situations for a while," and "to get away from the clatter and racket for a while." Subjects were asked to indicate "how important each of the following reasons are to you for participating in . . ." the particular recreation activity. The reasons were evaluated on a 5-point scale of "not at all important" to "extremely important." In this study, the physical and social escape domains were created by summing across the respective five items.

Experimental Procedure

During each of the recollection treatments subjects read a standardized set of instructions containing a list of fourteen questions which prompted subjects to mentally recall specific aspects of that experience (consisting of the planning, participation, and evaluation of the event). To ensure that subjects remained focused on the specific experience, a modification of the "Thought Sampling Approach" (Klinger, 1978) was adopted. Subjects were informed in the instructions that after three minutes of mental recollection they would be asked to verbalize their thoughts for a period of one minute.²

Prior to each of the three recollections, subjects listened to the autogenic relaxation tape for a period of three minutes. Only responses to the first relaxation tape were used to test the hypotheses. The purpose of the remaining two relaxation conditions was to bring subjects back to a baseline level before administering the next treatment.³ To reduce bias, the same relaxation tape was used on all three occasions.

Data Collection

Negative affect, positive affect, and physical health symptom scores were measured using a 32-item self-report scale that was administered at the end of each recollection treatment and after the initial relaxation tape. Each self-report scale took approximately one minute to complete. In total, four self-report scales were completed by each subject (one for each of the three

²Data for the 1 minute verbal recall are not presented here.

³Follow-up tests revealed no significant differences (at $p = .05$) for any of the physiological responses between the three autogenic relaxation conditions.

recollection treatments and once for the initial autogenic relaxation condition).

Data Analysis

All analysis was conducted on an IBM-compatible personal computer using SPSS/PC+ Version 4.01 (Norusis, 1991). A significance level of $p = .05$ was used for all statistical tests. Cronbach's alpha was used as a measure of reliability for the Positive Affect Negative Affect Scale and the State Symptom Checklist Scale. To measure differences in the dependent measures (positive affect, negative affect and perceived health symptoms) across the four treatment conditions (hypotheses #1 and #2) a procedure adopted by Schwartz, Weinberger and Singer (1981) was used: A doubly multivariate repeated measures MANOVA was followed by separate univariate analyses of each of the positive affect, negative affect, and state symptom checklist scales. For each significant univariate main effect, three (k-1) orthogonal post-hoc contrasts were conducted. Pillai's Trace was used as the omnibus test.⁴ This is the same procedure as that used by Tarrant et al. (1994). In addition, 95% confidence intervals are presented. To examine the influence of social and physical escape motives on the two recreation recollections (hypothesis #3) a multiple regression procedure (stepwise method) was used.

Results

Eighty one percent of subjects ($n = 44$) completed both stages of the study. Eight subjects from stage 1 were excluded because of health reasons and two subjects did not show for the laboratory experiment. The following active outdoor recreation experiences were recalled: snow skiing (29.5%), mountain climbing (18.2%), backpacking (15.9%), and mountain-bike riding (11.4%), fishing (9.1%), hunting (4.5%), water skiing (4.5%), kayaking (2.3%), rafting (2.3%), and scuba diving (2.3%). Passive outdoor recreation experiences included, sight-seeing (34.1%), walking in the outdoors (22.7%), sunbathing (13.6%), meditating (4.5%), photography (4.5%), picnicking (4.5%), and paleontology (2.3%).

Alphas for the Positive Affect, Negative Affect and State Symptom Checklist scales were .86, .82 and .85, respectively. No significant correlations were found between the positive affect and negative affect scales for any of the four treatment conditions, confirming previous findings that the two scales may be independent (Watson & Pennebaker, 1989).

Hypothesis #1

Hypothesis #1 was accepted. Table 1 shows the recollection of the exam experience produced significantly higher negative affect ($M = 26.5$), more

⁴Pillai's trace is one of the most robust and powerful tests for evaluating multivariate differences. It is recognized by Russell (1990) as "the statistic of choice" for analyzing multivariate psychophysiological data.

TABLE 1
Mean scores, standard deviations and 95% confidence intervals for the autogenic method, passive recreation, active recreation and exam recollections by positive affect, negative affect and physical health symptom scores.

Measure	Treatment condition ¹												F	p
	Autogenic Method			Passive Recreation			Active Recreation			Classroom Exam				
	M	S.D.	95% Interval	M	S.D.	95% Interval	M	S.D.	95% Interval	M	S.D.	95% Interval		
Positive ² Affect	20.8 ^a	4.8	19.6-22.0	30.5 ^b	8.7	28.3-32.7	37.8 ^c	6.4	36.2-39.4	21.5 ^a	7.3	19.7-23.3	88.6	<.001
Negative ² Affect	12.9 ^{a,b}	8.1	10.9-14.9	11.4 ^a	2.0	10.9-11.9	14.2 ^b	5.8	12.8-15.6	26.5 ^c	9.7	24.1-28.9	70.6	<.001
Physical ³ Symptoms	129.9 ^b	92.7	106.6-153.2	82.0 ^a	82.2	61.6-102.6	151.5 ^b	142.6	115.6-187.4	217.4 ^c	205.2	192.1-242.7	14.4	<.001

¹Different alphabetical superscripts indicate significant differences between mean values ($p < .05$).

²Positive and negative affect scores range from 10 ("not at all") to 50 ("extremely") with respect to a given affect item (e.g., "excited").

³Physical health symptom scores range from 0 ("no symptoms") to 1200 ("100% symptoms").

reports of physical symptoms ($M = 217.4$), and lower positive affect ($M = 21.5$) than either the active or passive recreation recollections. The passive recollection elicited significantly lower positive affect ($M = 30.5$) but, significantly lower negative affect ($M = 11.4$) and fewer physical symptoms ($M = 82.0$) than the active recollection.

Hypothesis #2

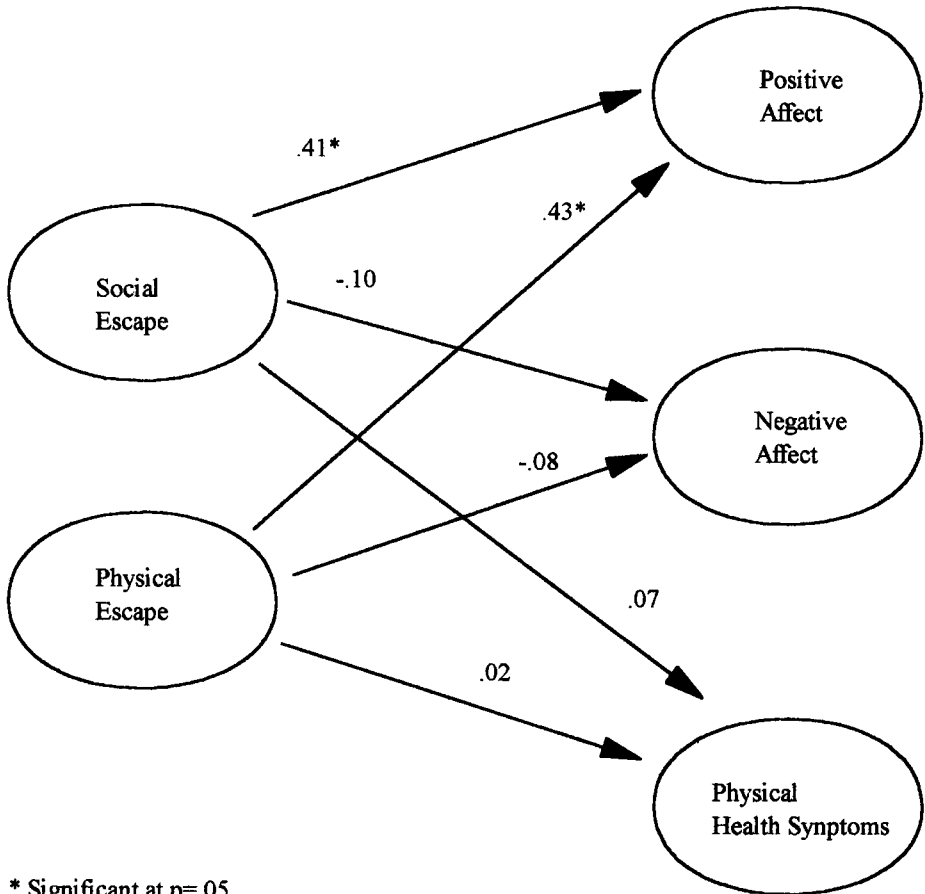
Hypothesis #2 was partially rejected. Table 1 shows that the autogenic relaxation method evoked significantly lower positive affect ($M = 20.8$) than both the active and passive recreation recollections, and more physical symptoms ($M = 129.9$) than the passive recollection. Although the autogenic method also produced higher negative affect ($M = 12.9$) than the passive recollection ($M = 11.4$), the difference was only significant at the $p = .06$ level. Negative affect and physical symptoms scores did not significantly differ between the autogenic method and the active recreation recollection.

Hypothesis #3

Hypothesis #3 was partially accepted for the active recreation recollection (Figure 1) but rejected for the passive recreation recollection (Figure 2). With the active recreation recollection, both the social and physical escape motives were significantly and positively related to positive affect scores (betas = .41 and .43, respectively); i.e., as the perceived importance of escape with a particular active recreation activity increased, subjects reported higher positive affect when recalling that experience. For the passive recollection, escape motives were unrelated to affect or physical health symptoms.

Discussion and Conclusions

Results of the study suggest that recollections of outdoor recreation experiences may have potential for application as a therapeutic technique. Recreation recollections (particularly of previous passive outdoor experiences) produced more positive subjective health states (significantly lower physical symptoms and higher positive affect, as well as slightly, though not significantly, lower negative affect) than the autogenic relaxation method. One explanation for these findings is that outdoor recreation recollections provide greater opportunities for involuntary attention to external (environmental) cues. In contrast, the autogenic method relies on directed attention toward internal (physical) sensations. Together, the Kaplans' and the Pennebaker models propose that when attention is internally (versus externally) directed, and when it concerns unstimulating or neutral (versus diverse and interesting) stimuli, self-reports of physical symptoms and negative feeling states are more likely to occur. In further support of this reasoning, it was also found that recollections of classroom exams (which require directed attention and avoidance of external cues), produced significantly higher symptom reporting and negative feeling states than the recreation recollections.



* Significant at $p = .05$

Figure 1. The effect of social and physical escape motives on positive affect, negative affect, and physical health symptoms for the active recreation recollection.

There is also some evidence that escape motives (and perhaps psychological motives in general) may play an important role in producing the positive effects associated with recalling active outdoor recreation experiences, but not necessarily with passive recreation recollections. One possible explanation for this is that the majority of outdoor recreation research using psychological motives has focused on active-type experiences, such as hunting, fishing, backpacking, etc. and not on more sedentary activities such as sight-seeing and sunbathing. The study results also support previous findings in the social-psychological literature that have shown motives to be an important determinant of other dependent measures such as satisfaction (e.g., Manning, 1985; Vaske, Donnelly, Heberlein, & Shelby, 1982).

Before discussing implications of the findings, at least two limitations with regard to the use and application of the autogenic relaxation method

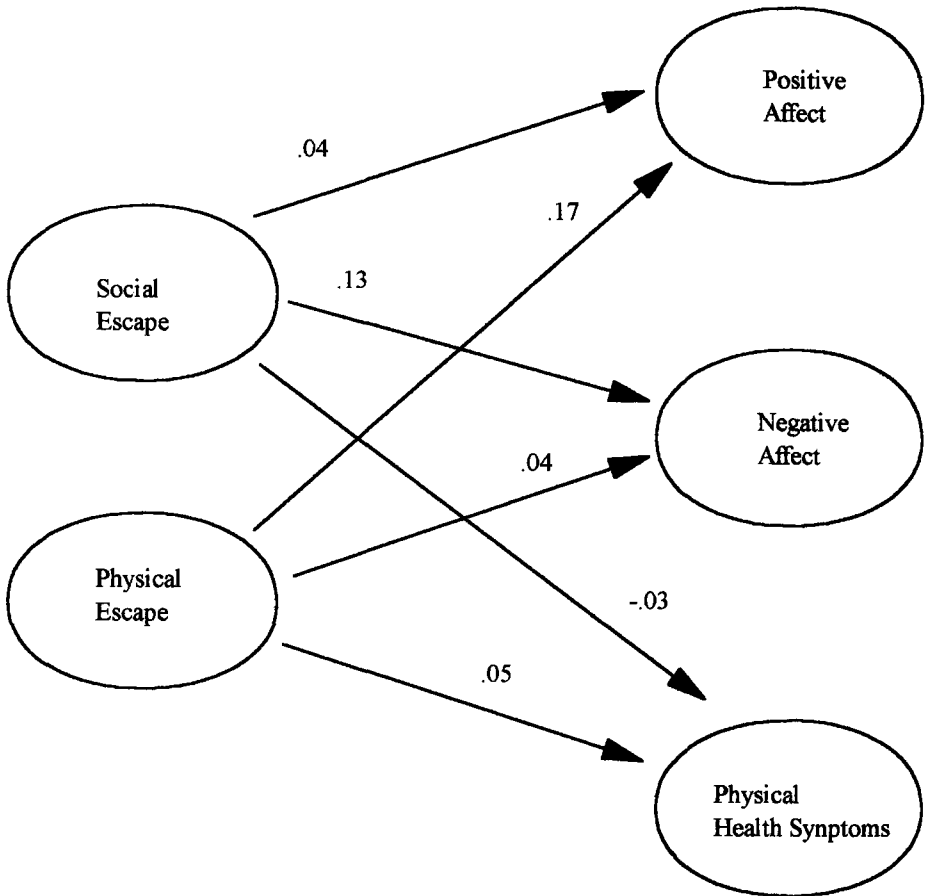


Figure 2. The effect of social and physical escape motives on positive affect, negative affect, and physical health symptoms for the passive recreation recollection.

in this study should be noted. First, the use of the autogenic method, as a stress management technique, may not be directly comparable with recollections of past experiences. Although the generation of mental images is an important component of autogenics, the emphasis is more on kinesthetic (as opposed to purely visual) images (Chagill, 1992; Norris & Fahrion, 1984). Second, the autogenic method involves multiple training sessions each of approximately twenty minutes over many weeks of practice (Linden, 1993). A single 3-minute period, as used in this study, is probably insufficient to generate the type and magnitude of responses reported in the literature.

In addition to autogenic training, guided imagery is another commonly used stress management technique. In guided imagery, individuals are presented with cues (usually in the form of questions) to visualize events in their

mind (Girdano, Everly & Dusek, 1990; Mandler, 1984). While these events typically involve the construction of new experiences, as opposed to the recollection of past events, they often include a natural setting, as in the example described by Girdano et al. (1990), "imagine yourself in your favorite relaxation spot, perhaps sitting on a quiet beach with the sun warming your body or fishing your favorite stream, [and] a relaxation response is triggered" (p.164). Based on the findings from the present study, there is evidence to suggest that recollections of outdoor recreation experiences have potential for use as a guided imagery technique. Particular applications might focus on cases where the intent is to provide either positive stimulation (for example, when dealing with depression or promoting cognitive competence, as in persons with Alzheimer's disease, Weiss, 1989) or to divert attention from mild discomfort and pain (as, for example, when undergoing dental treatment) (Fernandez, 1986; McCaul & Mallott, 1984; Sarafino, 1990). Clearly, however, additional work is needed to determine if some individuals are more adept in recalling past recreation events than others. Furthermore, when selecting specific outdoor recreation experiences to recall, it may be necessary to assess the individual's psychological motives associated with that activity. For example, in this study benefits were greater when subjects recalled an active recreation experience with which they expressed strong escape-related motives.

Results of the study also have applications for the development of a "Benefits Based Approach" (BBA) to outdoor recreation management. The BBA is an extension of the traditional "Experience Based Approach" (Driver, 1976; Manfreda, Driver, & Brown, 1983) in at least three ways: (1) it focuses on physical and psychological outcomes, (2) it emphasizes provision of leisure benefits in addition to managing for experience preferences, and (3) it is concerned with off-site as well as on-site experiences (Bruns, Driver, Lee, Anderson, & Brown, 1994). Findings from the current study as well as from Tarrant et al. (1994) provide some support for the BBA. First, changes in psychological and physical responses have been identified with specific recreation experiences. Second, the nature of these changes (greater positive affect, reduced negative affect, and lower physical health symptoms) may be considered beneficial in that they are indicative of an improved mental and physical state of health. Third, the work demonstrates that the benefits of any particular recreation experience are not limited only to on-site participation, but they also occur after the initial behavior has been completed (i.e., during recollection). Providing managers with information about the type and magnitude of benefits received from all stages of recreation behavior (anticipation, planning, participation, and recollection) will help improve decision-making and planning. For example, resources may be allocated (and priced) based on the likelihood of users obtaining long-term as well as short-term benefits. For users themselves, benefits research can enhance consumer sovereignty; i.e., by increasing consumer knowledge about the value of different recreation experiences, individuals can make more informed decisions regarding the use of their free-time.

Clearly, a number of questions about the beneficial effect of recalling outdoor recreation experiences remain. The study was conducted in a controlled laboratory setting using a specific set of instructions. The extent to which recollections produce benefits in everyday social contexts requires further study. Also, there is a need to explore the relationship between residual effects (investigated here) and actual on-site responses in order to determine how closely the benefits of recollection resemble those elicited during on-site participation. The effect of psychological motives, in general, on affect and physical symptoms is an area that should be examined. Finally, it is not apparent from the studies how recollections of outdoor recreation experiences compare to recreation behaviors that are less dependent upon a natural environment, or to ordinary resting activities that do not involve instructions to think. The use of information processing theories, in particular, may provide a fruitful approach to developing generalizations about the effect of recreation recollections.

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